

Frontiers in Education 2016

The Crossroads of Engineering and Business

October 12-15, 2016 | Bayfront Convention Center | Erie, PA

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Conference at a Glance

Wednesday, October 12

8:30 AM - 4:30 PM	Registration Open
1:00 PM - 4:00 PM	Workshop Session 1
5:00 PM - 8:00 PM	Workshop Session 2

Thursday, October 13

7:30 AM - 5:00 PM	Registration Open
7:30 AM - 8:30 AM	Focus on New Attendees Breakfast (<i>included in conference registration</i>)
8:30 AM - 9:30 AM	Plenary Session
9:30 AM - 5:00 PM	Exhibits Open
9:30 AM - 10:00 AM	Exhibit Hall Break
10:00 AM - 12:00 PM	Technical Sessions (T1)
12:00 PM - 1:30 PM	Lunch (<i>included in conference registration</i>)
1:30 PM - 3:00 PM	Technical Sessions (T2)
3:00 PM - 3:30 PM	Exhibit Hall Break
3:30 PM - 5:00 PM	Technical Session (T3)
6:00 PM - 9:00 PM	Reception at GE Customer Innovation Center (<i>included in conference registration</i>)

Friday, October 14

7:30 AM - 5:00 PM	Registration Open
7:30 AM - 8:30 AM	Breakfast (<i>included in conference registration</i>)
8:30 AM - 9:30 AM	Plenary Session
9:30 AM - 4:30 PM	Exhibit Hall Open
9:30 AM - 10:00 AM	Exhibit Hall Break
10:00 AM - 12:00 PM	Technical Sessions (F1)
12:00 PM - 1:30 PM	Lunch & FIE 2017 Presentation (<i>included in conference registration</i>)
1:30 PM - 3:00 PM	Technical Sessions (F2)
3:00 PM - 4:00 PM	Focus on Exhibits and New Faculty Fellows
4:00 PM - 5:30 PM	Technical Sessions (F3)
5:30 PM - 6:30 PM	Catalyzing Collaborative Conversations Sessions
7:00 PM - 9:30 PM	Reception and Awards Banquet (<i>additional ticket required</i>)

Saturday, October 15

7:30 AM - 5:00 PM	Registration Open
7:30 AM - 8:30 AM	Breakfast (<i>included in conference registration</i>)
8:30 AM - 10:00 AM	Technical Sessions (S1)
10:00 AM - 10:30 AM	Break
10:30 AM - 12:00 PM	Technical Sessions (S2)
12:15 PM - 1:30 PM	Lunch (<i>included in conference registration</i>)
1:30 PM - 3:00 PM	Technical Sessions (S3)
3:00 PM - 3:30 PM	Break
3:30 PM - 5:00 PM	Technical Sessions (S4)

Welcome from the General Chairs



Steve Frezza
Gannon University



Dipo Onipede
Penn State University

It is our pleasure to welcome you to Erie and the 46th Annual Frontiers in Education Conference. The theme of this year's conference is *The Crossroads of Business and Engineering*. We want to ensure that you have a vibrant, engaged and productive time and the planning committee has prepared an outstanding set of technical sessions, workshops, and social events where you can socialize, forge new relationships and strengthen existing ties.

Business and engineering share similar philosophical roots, and over the last century have proven to be mutual drivers of massive growth in the global economy. Innovation and entrepreneurship, particularly in technology immediately comes to mind, but these crossroads impact more the macro level. Business and engineering decisions drive the development of all engineering projects, and impact nearly every aspect of the engineered product lifecycle. For example, key process indicators and business value drives nearly every engineering project launch, balanced against technical risks and cost estimates. Assessment of these costs and benefits impact project launch, conduct and closure. Procurement, sourcing and subcontracting are significant drivers in major design teams while roles for the business process re-engineering continues to play a role in industry. These and other crossroads of engineering and business, as well as their impact in engineering education are scattered throughout this year's technical sessions.

Some innovations at FIE this year include two all-day faculty development workshops on *Evidence Based Teaching* (IEEE-STC) and *Designing an Engineering Recovery Course* (Pacific Crest). Several invited workshops and panels on topics such as Systems Engineering Education, Cyber-security Education, Computing Education and Data Engineering Education. Also, FIE and ASEE are co-sponsoring an *E-in-STEM* workshop for PK-12 faculty and administrators on the Saturday of the conference in order to bring the benefits of ASEE to the Erie region.

The conference this year is located at the Bayfront Convention Center overlooking the Presque Isle Bay on Lake Erie and is sponsored by the IEEE Education Society, the IEEE Computer Society and the ASEE Educational Research and Methods Division. We would like to acknowledge our host institutions, Gannon University and Penn State Erie, The Behrend College for collaborating to bring excellence in engineering education to the Erie region. We would also like to thank GE Transportation for hosting the Thursday night reception at the GE innovation Center, and we hope you signed up with your registration to visit one of the largest locomotive engineering and manufacturing facilities in the world.

We have enjoyed every moment as General Chairs because we have an outstanding team of volunteer educators and professional support staff who have worked very hard to put together a great event. The technical program committee (TPC) chairs—Deborah Trytten, Holly Matusovich, and Manuel Castro—have spent the past 12 months managing the peer review process of 650 submissions and the final placement of the 409 papers, workshops, panels, and special sessions that were accepted into the technical program. This serious task generates the heart of the conference, and we thank them for their insight, patience, and dedication to engineering education. They have put together a diverse conference that balances papers critically examining the conference theme with papers that continue the tradition of Frontiers in Education as a place where new classroom techniques, best practices, and rigorous educational research can all be explored side-by-side in an open dialog. The TPC chairs were assisted by a great special sessions chair—Allison Godwin, as well as two outstanding international liaisons—Edmundo Tovar Caro and Melany Ciampi—and we thank them for their dedication to promoting Frontiers in Education. The TPC chairs were also supported by this year's faculty fellows chair—Rachel Kajfez, with help of the chair emeritus—James Huff.



Karinna Vernaza
Gannon University

While the technical program forms the heart of the conference, the fact remains that an entire infrastructure must be built for that technical program to stand upon. Social events, exhibit halls, awards programs, the conference proceedings, registration, meals, and logistics all enhance the technical program. Robert Hofinger completed another year of outstanding work interacting with our exhibitors and industry representatives.

We extend a sincere thanks to Kevin Curry and his staff at the University of Kansas Continuing Education. As Assistant to the General Chair and logistics coordinator, Kevin provides conference planning and logistical services to Frontiers in Education, and has done so professionally and effectively for many years. Similarly our technical support from Cynda Covert and her colleagues at Conference Catalysts has been as effective as it has been a delight.

It has been a long process of turning an idea into an active collaboration leading to such a great conference. To this end we want to extend our most sincere thanks to the creative and hardworking conference committee – Karinna Vernaza and Melanie Ford – without whom we would not have been able to make this conference come off. Their many contacts, attention to detail, humor and professionalism throughout the process of making this conference come to life has been brilliant.

We sincerely hope that you enjoy your stay in Erie and the high-quality dialogs upon which Frontiers in Education has built its reputation.

Steve Frezza and Dipo Onipede



Melanie Ford
Penn State Erie,
The Behrend College

Welcome from the Program Co-Chairs



Deborah A. Trytten



Holly Matusovich



Manuel Castro

Thank you for joining us for FIE 2016! We are glad you are here. We hope that you will find your experience here enjoyable and valuable as you participate in the broad range of keynotes, paper, panel, and special sessions, workshops, and social activities that have been scheduled.

This year's conference theme is The Crossroads of Engineering and Business. If you are new to the conference, you will find sessions on a wide variety of topics related to engineering and computing education. If you have been to FIE before, you will discover new opportunities, such as Catalyzing Conversations, as well as some of the tried and true favorites in the special sessions and traditional paper/panel sessions. The technical program is complemented by the conference's networking opportunities in the coffee breaks, thanks to our sponsors, or during a sit-down meals for breakfast and lunch on Thursday, Friday, and Saturday. We also will have a welcome reception at the GE Customer Innovation Center that you won't want to miss, and we hope you could attend to the awards banquet to congratulate our colleagues!

Our authors deserve the credit for the continuing quality and success of this conference. We also thank the reviewers, who volunteered their time to provide quality, constructive feedback to the authors and the program committee as well as session chairs that drive the session-to-session in the conference.

Enjoy your time in Erie, Pennsylvania, and see you next year in Indianapolis.

Deborah A. Trytten, University of Oklahoma, USA

Holly Matusovich, Virginia Tech, USA

Manuel Castro, UNED, Madrid, Spain

Message from the FIE Steering Committee

Welcome to Erie Pennsylvania City and the 46th annual Frontiers in Education Conference!

FIE is one of the world's premier engineering education conferences. We hope you find the conference content stimulating as you connect with old friends and expand your network to include new colleagues.

This conference is organized by the General Chairs and the Technical Program Committee, with oversight from the FIE Steering Committee. All of these folks are volunteers, so please take an opportunity to thank them.

If you get a chance, please visit the recently updated FIE Clearing House site at <http://fie-conference.org/>. At this site you will find the conference acceptance rate, past award winners and instructions on how to apply to host FIE. If you have suggestions on how to further improve this site, please send them to me.

This year, the FIE Steering Committee is beginning a strategic planning process. Once this process is in place, we will be asking for your input on the mission and vision of the conference, including the desired size, technical program specifications, impact factor and registration fee structure. We hope that you will participate in the process once we have it in place.

The Steering Committee works for the Societies and the member communities. We encourage you to contact any one of us to discuss the FIE conference. We can be identified by Steering Committee ribbons on our conference badges.

ASCE Educational Research and Methods Division Representatives

- Beth Eschenbach, (outgoing chair) Humboldt State University, Beth@humboldt.edu
- Archie Holmes, University of Virginia, ah7sj@virginia.edu
- James Morgan, Texas A&M University, jmorgan@civil.tamu.edu

IEEE Computer Society Representatives

- Stephen Frezza, (incoming chair) Gannon University, FREZZA001@gannon.edu
- Arnold Pears, Uppsala University, Arnold.Pears@it.uu.se
- Deborah Trytten, University of Oklahoma, dtrytten@ou.edu

IEEE Education Society Representatives

- Russ Meier, Milwaukee School of Engineering, meier@msoe.edu
- James Sluss, University of Oklahoma, sluss@ou.edu
- Edmundo Tovar, Universidad Politecnica de Madrid, etovar@fi.upm.es

This is my last FIE conference as FIE Steering Committee Chair. At the end of the conference, Steve Frezza will begin his two year position as Chair. I thank the committee for your collegiality and fine service while I was chair. I look forward to serving with Steve, as I know he him to be a committed and capable leader.

I hope each of you has a wonderful FIE conference in Erie, Pennsylvania.

Sincerely,

Beth Eschenbach
FIE Steering Committee Chair
Humboldt State University
Arcata, CA USA
Elizabeth.Eschenbach@humboldt.edu

FIE 2016 Planning Committee

General Co-Chair

Steve Frezza
Gannon University

General Co-Chair

Dipo Onipede
Penn State Erie, The Behrend College

Conference Committee

Karina Vernaza
Gannon University

Melanie Ford

Penn State Erie, The Behrend College

ASEE/ERM Program Co-Chair

Holly Matusovich
Virginia Tech

IEEE/Computer Society Program Co-Chair

Deborah Trytten
University of Oklahoma

IEEE/Education Society Program Co-Chair

Manuel Castro
Universidad Nacional de Educación a Distancia

Workshop, Special Sessions & Panels Chair

Allison Godwin
Purdue University

Exhibits Chair

Robert J. Hofinger
Purdue University

Publications Chair

Conference Catalysts, LLC

New Faculty Fellows Chairs

James Huff
Harding University

Rachel Kajfez

Oklahoma State University

Assistant to the General Chairs

Kevin Curry
University of Kansas

International Co-Chair, Europe

Edmundo Tovar Caro
Universidad Politecnica de Madrid

International Co-Chair, South America

Melany M. Ciampi
VP COPEC- Science and Education Research Council

Conference Historian & Awards Chair

Ed Jones
Iowa State University

FIE Steering Committee

***ASEE Educational Research and Methods Division
Representatives***

Jim Morgan, Texas A&M University
(June 2011-June 2014)

Archie Holmes, University of Virginia
(June 2012 - June 2015)

Elizabeth Eschenbach, Humboldt State University
(June 2010 - June 2016) Steering Committee Chair

IEEE Computer Society Representatives

Stephen Frezza, Gannon University
(June 2011 - June 2014)

Arnold Pears, Uppsala University
(June 2009 - June 2015)

Deborah Trytten, University of Oklahoma
(June 2013 - June 2016)

IEEE Education Society Representatives

Russ Meier, Milwaukee School of Engineering
(June 2007 - June 2015)

Edmundo Tovar Caro, Universidad Politecnica de
Madrid (June 2008 - June 2014)

James Sluss, University of Oklahoma
(June 2012 - June 2015)

Future FIE Conferences

FIE 2017 Indianapolis, Indiana

FIE 2018 San Jose, California

Are you interested in hosting a future FIE conference?

Check out the "Propose to Host" section of the FIE

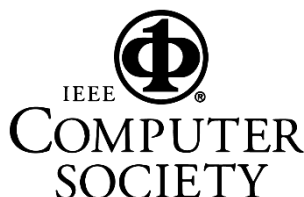
Clearing House website: <http://fie-conference.org/>.

Conference Sponsors

FIE 2016 is sponsored by:

American Society for Engineering Education (ASEE)
Educational Research Methods (ERM) Division

Institute of Electrical and Electronics Engineers (IEEE)
IEEE Computer Society
IEEE Education Society



FIE 2016 is hosted by:



that emphasizes faith, leadership, inclusiveness and social responsibility.

Gannon is a Catholic, Diocesan university dedicated to excellence in teaching, scholarship and service. Our faculty and staff prepare students to be global citizens through programs grounded in the liberal arts and sciences and professional specializations. Inspired by the Catholic Intellectual Tradition, they offer a comprehensive, values-centered learning experience



With the resources and opportunities of a major research university in a welcoming, student-centered environment, Penn State Behrend offers a unique learning experience to 4,700 undergraduate and graduate students.

Penn State Behrend is a four-year, residential college offering thirty-seven bachelor's degrees, five master's degrees, and four associate degree programs. Although the campus is among the largest in the Penn State system, our faculty-to-student ratio of 1:16 provides students with a personalized learning experience from accomplished instructors.

Corporate Affiliates and Sponsorships

Corporate affiliates play an important role in supporting FIE conferences. This support subsidizes the cost of the award presentations and of meal functions. We appreciate these supporters and the part they play in making the 2016 FIE conference an outstanding event.

Diamond Sponsor



Hewlett Packard Enterprise sponsors the ASEE Frederick Emmons Terman Award and its presentation.

Gold Sponsor



GE Transportation sponsors our opening evening reception at their Customer Innovation Center. The facility is a show place for GE's products and technology. In the atrium you will see the size and scope of GE products and with a touch of your finger on a screen, learn about how they are used in multiple industries. The center is connected classrooms and lab space that is large enough to house four locomotives plus engines and equipment. Some may be on display during our visit.

Conference Break Sponsor



Mouser Electronics is sponsoring our full day of breaks on Friday. Stop by and see their exhibit when you are enjoying some refreshments.

Local Sponsor



VisitErie has been instrumental in offering support to the conference throughout the planning process, including financial support for planning travel and travel to the conference reception.

E-in-STEM Sponsor



Ignite Erie™ as an economic development strategy was launched in November 2013 when the Erie County Gaming Revenue Authority and 26 of Erie, Pa.'s leading innovation agencies co-hosted Ignite Erie: A Day of Innovation. In 2014, ECGRA rolled out phase two of Ignite Erie: a three-part, \$6 million investment in inner-city small business development, industry/university collaborations, and mission-related causes. Through its partners, Ignite Erie is catalyzing small business growth in the region—one concept, one investment at a time. Learn more at IgniteErie.org or ECGRA.org.

FIE 2016 Exhibitors

The FIE vendor and association exhibits are a popular and rewarding tradition for both attendees and exhibitors. Exhibits will include materials, equipment, textbooks, software, and state-of-the-art tools applicable to engineering education. We thank the vendors for their financial support and contributions to making FIE 2016 a meaningful experience.

Exhibit Hall Hours

The exhibits will be open in the Ballroom 9:00 a.m.–5:00 p.m. Thursday and 9:00 a.m.–4:30 p.m. Friday. The following companies have committed to exhibiting at FIE 2016:

EXHIBITOR	WEBSITE
ARM	arm.com/support/university
EMA Design Automation	ema-eda.com
FIE 2017	fie2017.org
IEEE Computer Society	computer.org
IEEE Education Society	ieee-edusociety.org
JMP statistical discovery software from SAS	jmp.com
The MathWorks	MathWorks.com
Mouser Electronics	mouser.com
National Science Foundation	NSF.gov
NVIDIA	nvidia.com
Purdue University Engineering Education	engineering.purdue.edu/ENE
University of Cincinnati Department of Engineering Education	ceas.uc.edu/dee.html
Utah State University Department of Engineering Education	eed.usu.edu
Virginia Tech Department of Engineering Education	enge.vt.edu
zyBooks	zybooks.zyante.com

Focus on Exhibits and New Faculty Fellows Poster Presentation

Attendees and participants will be encouraged to visit the exhibit area throughout the conference. In order to provide full exposure for the exhibits, a special "Focus on Exhibits" session is planned for the afternoon of Friday, October 14th, during which time there will be no technical sessions scheduled. The New Faculty Fellows will also display their posters at this time. Door prizes contributed by some of the exhibitors will be awarded during the Focus on Exhibits. You must be present to win.

Exhibitor Showcase Presentations

Thursday, October 13

10 am – Noon	JMP Academic Programs	Convention Center Room 130A
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Topic: Engineering analytics: What today's engineer needs to know about modern statistical methods and analytics.

Description: The modern technological era is defined, in part, by the volumes of data produced daily. Engineering analytics involves using data to guide decision-making and strategy, helping dimension “the problem” and the business value of potential solutions, long before time and money are spent “fixing” the problem. The emerging new role for engineers must include a literacy and even a mastery of analytics, starting with data and statistics even before first principles are studied.

We will present an analytics roadmap, and discuss core concepts and techniques in the engineering analytics toolbox. We will use a case study to illustrate tools for data preparation and demonstrate interactive visualization techniques using JMP Pro, a desktop statistical software from SAS. Then, we will present core modeling techniques, including model validation, logistic regression, classification trees, neural networks, and three penalized regression techniques: Lasso, Elastic Net, and Ridge Regression. Finally, we will introduce tools for simulating model results and dynamically exploring “what if” scenarios.

1:30 – 3 pm	zyBooks	Convention Center Room 130A
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3:30 – 5 pm	ARM	Convention Center Room 130A
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Friday, October 14

10 am – Noon	Mathworks	Convention Center Room 130A
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Topic: Integrating low-cost hardware with MATLAB and Simulink

Description: Project-based Learning is a teaching method used to demonstrate theoretical principles while working through real-world problems and solutions. Access to low-cost hardware (Arduino, Raspberry Pi, etc.) and smartphone platforms offer faculty options for teaching through hands-on experience.

This hands-on showcase will introduce attendees to the use of MATLAB and Simulink in classroom education. Some familiarity with MATLAB and Simulink would be helpful but not essential. Participants will learn the workflow for developing and deploying algorithms to low-cost hardware.

At the end of this showcase, attendees will be able to:

1. design, simulate and test custom algorithms in MATLAB and Simulink
2. implement these algorithms on low-cost embedded hardware without writing any C-code
3. learn about the built-in support for other low-cost hardware platforms
4. explore the benefits of this workflow for course and capstone design projects

Exhibitor Showcase Presentations (Continued)

Friday, October 14

1:30 – 3 pm

NVIDIA

Convention Center Room 130A

Title: Teach Robotics with the 'Jet' Teaching Kit for Educators

Description: As performance and functionality requirements of interdisciplinary robotics applications rise, industry demand for new graduates familiar with GPU-accelerated computer vision, machine learning and other robotics concepts grows. We'll introduce you to a comprehensive set of academic labs and university teaching material targeted at 'Jet', the new NVIDIA Jetson-based low-cost, smart, autonomous, educational robot for use in introductory and advanced interdisciplinary robotics courses. The teaching materials start with the basics and focus on programming 'Jet', and move on to advanced topics such as computer vision, machine learning, robot localization and controls.

By attending this session, you'll also learn:

- How NVIDIA collaborates with academia to address the global challenges of teaching new technologies in the classroom
- Availability of free interdisciplinary robotics teaching material, platforms, and academic resources
- Best practices for incorporating 'Jet' into higher-ed robotics courses from real-world academics

Speakers:

John Seng, Professor, Cal Poly State University, San Luis Obispo

John Seng is a professor in the Computer Science department at Cal Poly State University, San Luis Obispo. He is also part of the Cal Poly Computer Engineering Program.

Joe Bungo, GPU Educators Program Manager, NVIDIA

Joe Bungo is the GPU Educators Program Manager at NVIDIA where he enables the use of GPU technologies in universities, including curriculum and teaching material development, facilitation of academic ecosystems, and hands-on instructor workshops. Previously, he managed university programs at ARM Inc. and worked as an applications engineer. Joe received his degree in Computer Science from the University of Texas at Austin.

Group Meetings

Wednesday, October 12

5:00 – 6:30 pm FIE Steering Committee Meeting Sheraton Griffin

Thursday, October 13

1:30 – 3:00 pm ASEE ERM Division Business Meeting Sheraton Griffin

Friday, October 14

9:00 am – Noon IEEE Education Society Board of Governors Meeting Sheraton Safe Harbor

1:30 – 5:30 pm IEEE Education Society Strategic Planning Committee Sheraton Safe Harbor

2:30 – 4:30 pm IEEE Education Society Standards Working Group and Subcommittee Sheraton Griffin

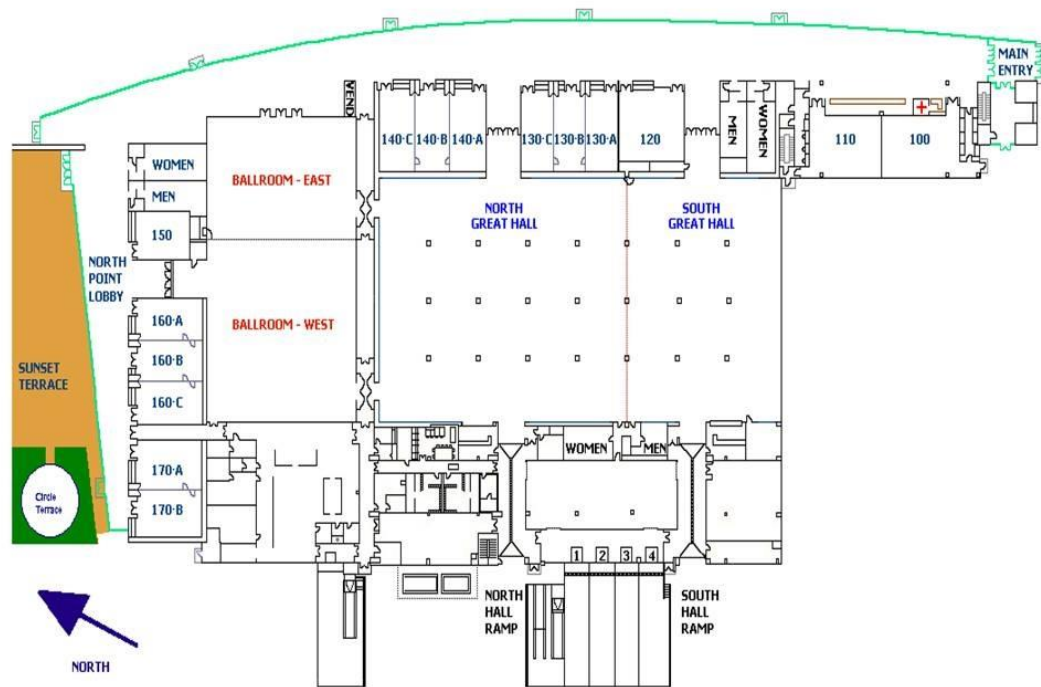
5:30 – 6:30 pm FIE2017 Planning Committee Meeting Sheraton Griffin

Saturday, October 15

8:00 – 10:00 am FIE Steering Committee Meeting Convention Center 130A

5:00 – 9:00 pm FIE Steering Committee Meeting Courtyard Starboard

Floor Plan



Workshops

Wednesday (Pre-Registration is required.)

Full Day Workshops

Evidence Based Teaching: Principles and Practice

Participants receive IEEE-CS certificate of participation and PDUs earned.

Aimed at those interested in improving their teaching practice from the known literature in engineering education. The target audience ranges from the new instructor to experienced, senior faculty interested in advancing the quality of the teaching practice. This workshop provides an overview of relevant research literature, and provides participants with hands on advice on choice of research approaches, data collection methods, and analysis techniques in the Scholarship of Teaching and Learning in Engineering.

The workshop consists of presentations, group discussions and review of case studies in the engineering education literature. Workshop activities and materials are drawn from engineering faculty development courses in engineering education offered at Uppsala University, Sweden since 2010.

Workshop Participants Will:

- Acquire portfolio of best practices in STEM education
- Read and discuss selected articles from the STEM higher education research literature
- Review models for systematic investigation of learning phenomena
- Reflect on application of STEM education theories to their own teaching
- Result: equipped to conduct evidence based innovation and evaluation



Arnold Pears BSc(Hons) PhD, is associate professor of computing education research at Uppsala University, Sweden. He has published more than 70 refereed articles and conference papers in computing and engineering education. He is an active member of the IEEE Computer Society, where he is a member of the Professional and Education Activities Board, and chairman of the Special Technical Community for Education. He is a Director of the Swedish National Centre for Student-centric Higher Education Development, and the Higher Education Advisory Council of the Faculty of Science and Technology at Uppsala University, Sweden.



John Heywood is author of Engineering Education. Research and Development in Curriculum and Instruction" which received the 2006 award for the best research publication from the Division for the Professions of the American Educational Research Association. He has just published "The Assessment of learning in Engineering education. Practice and Policy". He is a Fellow of the American Society for Engineering education and a Fellow of the institute of Electrical and Electronic Engineers. Before he retired he was Professor and Director of teacher education in the University of Dublin and is author of "Instructional and Curriculum Leadership: Toward Inquiry Oriented Schools".

Workshops (Continued)

Designing an Engineering Recovery Course Using Process Education

This workshop will help colleges turn things around for engineering students who have failed. Instead of sending out dismissal letters, challenge these students to prove they want to continue by obtaining an “A” in a course titled *Achieving Academic Success*.

The workshop consists of two parts:

Part 1: This session will detail the educational experience that transforms failing students into dean’s list students.

- Learn what works as we share the critical lessons we’ve learned in 20 years of conducting Learning to Learn Camps, especially those targeting STEM students: the theory, practice, and results that you can use
- The workshop will highlight a Recovery Course case study at Grand Valley State University (Spring 2015 plus recent results from Spring 2016) including the 1-week schedule, syllabus, logistics, work samples, and results
- A second case study details how the Hinds Community College Nursing program used the Recovery Course to transform students who failed out of the program into practicing nurses at a success rate of more than 65%
- We will share the structure and content of our STEM-tailored Learning to Learn Camps, demonstrating how the general content that all students need provides a natural foundation and context for the specialized content that most benefits STEM students who are struggling to succeed

Part 2: In this session, participants from each college will design and develop an engineering recovery course that is contextualized for their school, including a complete implementation plan (recruitment, course design, materials, training, and implementation guidelines). This session works **BEST** with a team from the same school; *if possible, register a team of 3 from your college*. If you don’t have your own team, you can still gain valuable experience working with a team from another school on their recovery course.

Half Day Workshops

On Wednesday afternoon and evening, FIE features workshops—highly interactive sessions selected for their timeliness and value. Workshops offer a concentrated professional development experience. The wide range of workshop topics offers opportunities for everyone from new faculty members to the most experienced educators to expand their skills and knowledge.

Conference attendees must register separately for workshops. There is a \$50 registration fee for each workshop.

Workshop 1A

Wednesday, October 12 1:00 PM - 4:00 PM

A Developmental and Adaptive Problem Based Learning (PBL) Model Across the Curriculum: From Theory to Practice in Integrating and Assessing PBL Experiences across the James Madison University Engineering Curriculum

registration is complimentary thanks to support from James Madison University

In this collaborative and participant-centered workshop, faculty will be introduced to a novel and adaptive Problem-Based Learning (PBL) model developed and implemented in JMU's Engineering program over the past eight years and supported by NSF awards. Participants will be provided with PBL theory, PBL examples, a PBL classification framework, assessment tools, and a PBL template for use across courses and curricula. Problem-solving is generally regarded as the most important cognitive activity in everyday and professional practice. Problems in real-world practice have been described as messy, complex, and ill-structured, whereas typical engineering classroom problems have been described as well-structured with single correct solutions. How do we prepare our students for real-world problem solving? For researchers and educators alike, there is an interest in better understanding the nature of PBL experiences because not all

Workshops (Continued)

PBL experiences are created equal. Understanding how aforementioned problem characteristics vary is essential for demystifying the process of learning through PBL and through traditional pedagogical methods. Different PBL experiences lead to different learning outcomes. Educators should intentionally design authentic learning experiences that expose students to all types of problems - well-defined to ill-defined, simple to complex in terms of knowledge integration, individual to team-based - so that students learn to be adaptive problem solvers.

Workshop 1B

Wednesday, October 12 1:00 PM - 4:00 PM

NSF Programs that support Engineering Education Research

Registration is complimentary thanks to support from the National Science Foundation

The goal of this session is to inform the engineering and engineering education communities about various funding opportunities offered through the Engineering Education Centers (EEC) Division and the Division of Undergraduate Education (DUE) at the National Science Foundation (NSF). The intended audience for the session includes those eligible to submit and other project stakeholders such as: • 2-year and 4-year college and university faculty members in STEM and STEM education • 2-year and 4-year college and university administrators • STEM industry representatives • Institutional, educational, discipline-based educational, and social/behavioral science researchers.

The workshop will be interactive as attendees will be open to ask questions freely during the presentation. NSF program directors will share details about current funding opportunities to support engineering education projects including the Advanced Technological Education (ATE) program, which, with an emphasis on two-year colleges, focuses on the education of technicians for the high-technology fields that drive our Nation's economy. ATE involves partnerships between academic institutions and industry to promote improvement in the education of science and engineering technicians at the undergraduate and secondary school (grades 7 through 12) levels. NSF Program officers will present an in-depth look at the Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) program, which seeks to increase the success of low-income academically talented students with demonstrated financial need who are pursuing associate, baccalaureate, or graduate degrees in STEM disciplines. S-STEM provides awards to Institutions of Higher Education to fund scholarships, and to enhance and study effective curricular and co-curricular activities that support recruitment, retention, student success, and graduation in STEM.

Program officers will discuss one of the newest DUE programs, Improving Undergraduate STEM Education (IUSE). Engineering Education Research programs in the Engineering Directorate of NSF deal with the Professional Formation of Engineers which involves the formal and informal processes and value systems by which people become engineers. Advancing holistic engineering formation; diversifying pathways to and through engineering; exploring citizen engineering, credentialing, and expertise; developing engineering-specific theories of how engineers are formed; and understanding how change in engineering formation processes travels, translates, diffuses, and/or scales are hallmarks of the program. Elements of the programs under this umbrella include: Introductions to the profession at any age; acquisition of deep technical and professional skills, knowledge, and abilities in both formal and informal settings/domains; and development of identity as an engineer and its intersection with other identities. Additionally, the presenters will share important resources to consider when developing proposals to the NSF and discuss the importance of collaborations among 2-year and 4-year institutions, industry, and other partners to foster STEM workforce development.

Workshops (Continued)

Workshop 1C

Wednesday, October 12 1:00 PM - 4:00 PM

Peer Grading Development Cycle

The workshop will focus on several aspects of creating a successful peer grading experience for instructors and students. The development cycle includes: the right exam rubric, video creation, creating a blind "coupon" sheet, using students and class time to grade and storage. A solid rubric is the best candidate for a test to be peer graded. The rubric will be used in creating videos that along with a correct answer, describe each point breakdown in detail. The rubric can be rigid or have partial credit on it. As the instructor, the class meeting is the only time to have everyone together, answer questions, make grading decisions that affect the whole, show the answers, display exam point breakdown, and finally, grade. In order to get all of this done, a private set of videos are created to quicken the information needed for grading. The workshop will use a trial version Camtasia to create the videos. When taking the test, the students are given a test with the blind "coupon" cover sheet so later, the student graders are unable to determine which student really took this test - protecting the privacy of the original test taking student. After the tests have been taken, the next class meeting can be set aside for peer grading. The instructor plays the afore mentioned videos which are broken up into segments in order for the student to either the focus on the grading or on their own answer since the possibility of one of them getting it right. Finally, attendees will be introduced to storing, organizing and linking the videos using YouTube.

The workshop is aimed at those interested in improving exam feedback and timeliness while empowering students with grading requirements and material that is essential for further learning within the course. The target audience ranges from the new instructor, to experienced, senior faculty who are interested in advancing the quality of their exams effectively correcting any lingering issues the students might continue to make if the test were graded in the traditional, slow and costly method. This workshop provides an overview of relevant research literature, and provides participants with hands on peer grading experience, video creation, and suggestion of data collection methods.

Workshop 2A

Wednesday, October 12 5:00 PM – 8:00 PM

Tips for Turning Good Ideas into Competitive National Science Foundation Engineering Education Research CAREER Proposals: A Grant Writing Workshop

Registration is complimentary thanks to support from the National Science Foundation

The purpose of this participant-centered workshop is to support new faculty in developing strong engineering education research NSF CAREER proposals. Participants will learn about existing NSF programs that support engineering education research and learn tips for developing strong proposals in developing a research plan and educational plan (two critical elements of successful NSF CAREER proposals). The workshop will be interactive in nature and will include activities designed to help participants identify areas in which their ideas and proposals can be enhanced. A pre-survey will be administered to capture participant expectations; and readings will be provided to support participants' preparation for this workshop. A post-survey will be administered to evaluate the effectiveness of the session.

The authors want to acknowledge the support of the National Science Foundation for supporting time and funds in the development of this workshop. The views expressed herein are those of the authors and do not necessarily represent those of NSF.

Workshops (Continued)

Workshop 2B

Wednesday, October 12 5:00 PM – 8:00 PM

Integrated Faculty Course Assessment Report (FCAR) Model with Traditional Rubric-Based (GR) Model to Enhance Automation of Student Outcomes Evaluation Process

The traditional rubric-based assessment model has been used widely by many universities in various formats. By and large, the major contribution in engineering accreditation is attributed to Dr. Gloria Rogers' work and workshops. This workshop will term the traditional rubric-based assessment model as the GR Assessment Model. The essence of the GR model lies in classifying the courses in the curriculum to three levels: introductory, reinforced, and mastery. It is customary for the GR assessment model to include only courses in the mastery level for the program outcomes assessment. The drawbacks of looking only at the courses at the mastery level are: (1) lack of information needed at the lower level to identify the root cause of the deficiency when the symptom occurs in the higher level courses; (2) lack of the mechanism to compute a clear indicator such as the Student Outcomes (SOs) performance index based on Performance Indicators (PI) of that SO in order to facilitate the automation of the evaluation process.

In this workshop, a brief summary of the essence of the GR methodology is first discussed, followed by the comparison to the essence of the FCAR methodology. A refined and tested implementation is presented to demonstrate how a GR approach can be integrated with the FCAR assessment approach to allow computation of the SO performance index from roll-up data based on the weighted average of the relevant PIs for three different levels of courses. Ultimately, each SO is assessed to determine whether the performance meets expectations, exceeds expectations, or is below expectations. Customarily, for the FCAR methodology, heuristic rules are used to gauge results on how the SO performance is measured up for the final three expectations. Results of how the SO performance index can be used to address the overall attainment of the SO expectation are shown

Workshop 2C

Wednesday, October 12 5:00 PM – 8:00 PM

Academic Coaching Tools for Increased Retention: Empowering Engineering Students in Their Education

How can we help undergraduate and graduate students to set and work toward their own goals, to take charge of their education and career path, and to hold themselves accountable - all without adding more to the workload for faculty and support staff? Learn how to empower engineering students to "own" their education utilizing coaching tools. Using coaching skills with students you advise, teach, mentor, supervise, etc. is a valuable tool to inspire skill development for successful engineering careers (e.g., taking initiative, embracing risk, critical and innovative thinking, self-reflection, etc.) and for improving student retention. In the case of underrepresented groups in engineering (e.g., women and by ethnicity), a coaching approach also helps these populations see and navigate negative assumptions they make about themselves that are actually a result of cultural/societal norms or implicit bias at work. Workshop engagement consists of definitions of and research behind coaching, a sample coaching session, and introduction to coaching tools. Small group discussion and coaching practice with peers is integrated throughout. Workshop activities and materials are drawn from research in fields of education, psychology, diversity and inclusion, and brain science, and from the practice of coaching in business and education contexts.

Plenary Sessions

Thursday, October 13, 8:30 – 9:30 AM Ballroom
KEEN – Engineering Unleashed



Dr. Douglas Melton is passionate about developing a future for engineering education that fosters an entrepreneurial mindset in students. In his current role as the Kern Entrepreneurial Engineering Network (KEEN) program director for The Kern Family Foundation, he has an opportunity to work with universities that share that vision. He enjoys interaction with faculty and students and the challenge of relating technical topics in a live and relevant manner and served as a faculty member for seventeen years within the department of Electrical & Computer Engineering at Kettering University in Flint, Michigan. At Kettering, he served as the program director for Entrepreneurship Across the University.

Friday, October 14, 8:30 - 9:30 AM Ballroom
The Digital Industrial Age

Few things have the potential to disrupt the industrial world like the ongoing exploitation of the Industrial Internet or “Internet of Things”. Think about your life before smart phones were widely available, and the dramatic difference in the way you live today. That same transformation is coming to power plants, appliances, hospitals, and transportation systems around the world. The optimization and control of industrial assets through digital technologies is the industrial revolution of our age. To meet that revolution, traditional business and technical sciences will be challenged to educate the leaders of the future, requiring an innate familiarity with digital capabilities, industrial apps and real time decision-making to enable this next leap in productivity.



Ed Hall is the General Manager, Engineering, for the GE Renewable Energy Onshore Wind business. In this role, he leads the Technology and Fleet Reliability Operations organizations for the \$7B Wind business with R&D spend of \$250M.

Ed spent the first 18 years of his career as a technologist in the gas turbine aircraft engine business with Rolls-Royce in Indianapolis. In 2001, Ed joined the GE Global Research team in Niskayuna NY where he was named Global Technology Leader for Physical Sciences. Over the next four years Ed managed research and development teams in aerodynamics and mechanical technologies for the wide range of businesses in the GE portfolio. In 2006, Ed moved to GE Transportation and assumed leadership of Locomotive Engineering, followed by a role leading the Diesel Engine Engineering organization.

Dr. Hall is a Mechanical Engineering graduate (B.S., M.S., Ph D.) of Iowa State University and is active in auto racing.

New Faculty Fellow Program

Each year, FIE invites new engineering and computer science faculty to submit applications for possible selection as New Faculty Fellows. A review panel of engineering and computer science faculty from assistant, associate, and full professorship levels completes a rigorous peer review of each applicant's conference paper, nomination letters and professional résumé. The fellowship provides a \$1,000 grant for conference travel expenses.

The purpose of the program is to promote the involvement of new faculty in the Frontiers in Education Conference so they will be exposed to the "latest and greatest" in engineering educational practices and will have the opportunity to exchange information with leaders in education innovations. This year, FIE 2016 will provide five registration and travel grants for awardees to attend the conference.

Focus on New Faculty Fellows

Each fellow will present a conference paper during FIE 2016. Join them in their session and share your thoughts and ideas about the future of engineering education. Also, during the Focus on Exhibits session Friday at 3 p.m., the Fellows will display posters describing their interests and activities and previewing the full papers that they will present as part of the FIE 2016 technical sessions.

2016 New Faculty Fellows:

Benjamin Ahn Iowa State University

T1H Applicability of Online Mechanics of Materials Course for Engineering Undergraduate Students
S4A Correlation between Engineering Student Leadership Practices, Personality Types, and Demographic Characteristics

Andrew Danowitz California Polytechnic State University

T1I Leveraging the Final Project to Improve Student Motivation in Introductory Digital

Courtney Faber The College of New Jersey

T3I Measuring Engineering Epistemic Beliefs in Undergraduate Engineering Students
S1I Understanding Undergraduate Engineering Researchers and How They Learn

Allison Godwin Purdue University

S3H Visualizing Systematic Literature Reviews to Identify New Areas of Research

Jacqueline McNeil University of Louisville

F2I Entry Pathways, Academic Performance, and Persistence of Nontraditional Students in Engineering by Transfer Status

Conference Amenities

Breakfast (included in conference registration)

7:30 a.m.–8:30 a.m. Thursday Ballroom

7:30 a.m.–8:30 a.m. Friday Ballroom

7:30 a.m.–8:30 a.m. Saturday Ballroom

Refreshment Breaks • Exhibit Hall - Ballroom

Coffee, tea, and soft drinks available all day Thursday, Friday, and Saturday

Lunches (included in conference registration)

Frederick Emmons Terman and Harriett B. Rigas Awards Luncheon - Ballroom

Sponsored by Hewlett-Packard Enterprise

Noon –1:30 p.m. Thursday

The Frederick Emmons Terman Award is presented annually to an outstanding young electrical engineering educator by the Electrical and Computer Engineering Division of the American Society for Engineering Education. The Harriett B. Rigas Award is presented annually to an outstanding woman engineering educator in recognition of her contributions to the profession and to enhancing the role of women in engineering.

Luncheon - Ballroom

Noon –1:30 p.m. Friday

Noon –1:30 p.m. Saturday

Reception (included in conference registration – advanced registration required) • **GE Customer Innovation Center**

6:15 p.m.–9:30 p.m. Thursday

Join your colleagues as we board busses and take the short ride to the **GE Customer Innovation Center**. The facility is a show place for GE's products and technology. In the atrium you will see the size and scope of GE products and with a touch of your finger on a screen, learn about how they are used in multiple industries. The center is connected classrooms and lab space that is large enough to house four locomotives plus engines and equipment. Some may be on display during our visit.

New Faculty Fellows • Exhibit Hall – Ballroom

3:00 p.m.–4:00 p.m. Friday

A special session focusing on the New Faculty Fellows will be held on Friday. This session will provide an opportunity to meet this year's New Faculty Fellows, a group of new CSET educators who were selected based on an application and a full paper being presented at this year's conference. There will also be an opportunity to view their poster presentations at this time.

Focus on Exhibits • Exhibit Hall – Ballroom

3:00 p.m.–4:00 p.m. Friday

Visit the FIE exhibits and check out the latest textbooks, computer software, lab equipment, and other innovations while enjoying refreshments provided by our sponsor.

Conference Amenities (Continued)

Awards Banquet • Sheraton Hotel Harlequin Room

7:00 p.m.–9:30 p.m. Friday

Thanks to our sponsor, the IEEE Education Society, the Frontiers in Education Conference annual gala networking dinner and awards program is only \$30 per person. An opening reception will be followed by a full-service plated meal. This business formal event is sponsored by the IEEE Education Society - a group of more than 3,000 engineers and academics dedicated to advancing the scholarship and practice of engineering education. You do not have to be an IEEE Education Society member to attend. Tickets can be added to your registration on site.

FIE Registration Conference Desk

Registration will be open during these times:

Wednesday	8:30 a.m. – 4:30 p.m.	Outside Sheraton Hotel Harlequin Ballroom
Thursday	7:30 a.m. – 5:00 p.m.	Outside Room 140 of Convention Center
Friday	7:30 a.m. – 5:00 p.m.	Outside Room 140 of Convention Center
Saturday	7:30 a.m. – 5:00 p.m.	Outside Room 140 of Convention Center

Hospitality Table • Near Conference Registration

If you are looking for a certain kind of a restaurant, shop, golf course, or health club, stop by the hospitality table close to the registration area. Maps and brochures of area attractions will be available.

FIE Message Center • Near Conference Registration

The conference will maintain a message board by the registration area. Messages received for conferees will be posted there. In an emergency, we will make every effort to locate you.

Award Selection Committee Chairs

Frontiers in Education Conference

Benjamin J. Dasher Best Paper Award	Diane Rover
Helen Plants Award	Elizabeth Eschenbach
Ronald J. Schmitz Award	Robert Hofinger

ASEE Electrical and Computer Engineering Division

Hewlett-Packard Frederick Emmons Terman Award	Jeffrey Andrews
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IEEE Education Society

IEEE William E. Sayle Award for Achievement in Education	Susan Conry
IEEE Transactions on Education Theodore Bachman Award	Susan Lord
Chapter Achievement Award	Kai Pan Mark
Distinguished Chapter Leadership Award	Trond Clausen and Emmanuel Gonzalez
Distinguished Member Award	Victor Nelson
Edwin C. Jones, Jr. Meritorious Service Award.....	Susan Lord
Hewlett-Packard/Harriett B. Rigas Award	Joanne Bechta Dugan
Mac Van Valkenburg Early Career Teaching Award.....	S. Hossein Mousavinezhad
Student Leadership Award	Trond Clausen

2016 FIE Conference Awards Presentations

Thursday, October 13..... Terman/Rigas Awards Luncheon

ASEE ECE Division Hewlett-Packard Frederick Emmons Terman Award
IEEE Education Society Hewlett-Packard/Harriett B. Rigas Award

Friday, October 14..... Awards Banquet

Frontiers in Education (FIE) Conference Awards

FIE Benjamin J. Dasher Best Paper Award
FIE Helen Plants Award
FIE Ronald J. Schmitz Award

IEEE Education Society

William E. Sayle Award for Achievement in Education
IEEE Transactions on Education Theodore E. Batchman Best Paper Award
Chapter Achievement Award
Distinguished Chapter Leadership Award
Distinguished Member Award
Edwin C. Jones, Jr. Meritorious Service Award
Mac Van Valkenburg Early Career Teaching Award
Student Leadership Award

Newly Elected IEEE Fellows



Sanjit A. Seshia
University of California,
Berkeley

Past Recipients

'69 Michael Athans
'70 Andrew P. Sage
'71 Joseph W. Goodman
'72 Taylor L. Booth
'73 Sanjit Mitra
'74 Leon Ong Chua
'75 Michael L. Dertouzos
'76 Stephen W. Director
'77 J. Leon Shoet
'78 Ronald A. Rohrer
'79 Martha E. Sloan
'80 V. Thomas Rhyne
'81 Ben Garland
Streetman
'82 Toby Berger
'83 Daniel P. Siewiorek
'84 Mathukumalli
Vidyasagar
'85 Peter S. Maybeck
'86 Lance A. Glasser
'87 Kenneth L. Short
'88 Adel S. Sedra
'89 Frank L. Lewis
'90 Jerry D. Gibson
'91 Barry W. Johnson
'92 H. Vincent Poor
'93 Mark S. Lundstrom
'94 Supriyo Datta
'95 Perinkolam P.
Vaidyanathan
'96 Prithviraj Banerjee
'97 Edward A. Lee
'98 Edwin K. P. Chong
'99 Randy H. Katz
'00 Sergio Verdu
'01 Zoya Popovic
'02 Theodore S.
Rappaport
'03 Wayne Wolf

ASEE ECE Division Hewlett-Packard Frederick Emmons Terman Award

For writing and other contributions to electrical engineering and computer science education.

Sanjit A. Seshia is an Associate Professor in the Department of Electrical Engineering and Computer Sciences at the University of California, Berkeley. He received an M.S. and Ph.D. in Computer Science from Carnegie Mellon University, and a B.Tech. in Computer Science and Engineering from the Indian Institute of Technology, Bombay.

His research interests are in dependable computing, formal methods, and computational logic, with a current focus on problems in cyber-physical systems and computer security. He is co-author of a widely-used textbook on embedded systems and has led the development of technologies for cyber-physical systems education. His awards and honors include a Presidential Early Career Award for Scientists and Engineers (PECASE) and an Alfred P. Sloan Research Fellowship.

About the Terman Award

'04 Keshab K. Parhi
'05 Ali H. Sayed
'06 Vijay K. Madisetti
'07 Russel Jacob (Jake)
Baker
'08 Keith M. Chugg
'09 David Tse
'10 Bhaskar
Krishnamachari
'11 Tony Givargis
'12 Ali Niknejad
'13 Mung Chiang
'14 Changzhi Li
'15 Jeffrey G. Andrews

The Frederick Emmons Terman Award is presented annually to an outstanding young electrical or computer engineering educator by the Electrical and Computer Engineering Division of the American Society for Engineering Education. The Terman Award, established in 1969 by Hewlett-Packard Enterprise, consists of \$5,000, an engraved gold-plated medal, a bronze replica of the medal mounted on a walnut plaque, and a parchment certificate.



The recipient must be an electrical engineering educator who is no more than 45 years old on June 1 of the year in which the award is presented and must be the principal author of an electrical engineering textbook published before June 1 of the year of his/her 40th birthday. The book must have been judged by his/her peers to be an outstanding original contribution to the field of electrical engineering. The recipient must also have displayed outstanding achievements in teaching, research, guidance of students, and other related activities.

About Frederick Emmons Terman

Frederick Emmons Terman received his A.B. degree in chemistry in 1920, the degree of engineer in electrical engineering in 1922 from Stanford University, and his Sc.D. degree in electrical engineering in 1924 from Massachusetts Institute of Technology. From 1925-1965, he served as instructor, then professor of electrical engineering, executive head of the Electrical Engineering Department, dean of the School of Engineering, provost, vice president, and finally, as acting president of Stanford University.

Among the many honors bestowed upon him were: the IEEE Medal of Honor; the first IEEE Education Medal; the ASEE's Lamme Medal; the 1970 Herbert Hoover Medal for Distinguished Service to Stanford University; an honorary doctor's degree by Harvard; a decoration by the British government; the Presidential Medal for merit as a result of his war work; and the 1976 National Medal of Science from President Ford at a White House ceremony.

Dr. Terman was a professor at Stanford University when William Hewlett and Dave Packard were engineering students there. It was under Dr. Terman's guidance in graduate work on radio engineering that Mr. Hewlett built the first tunable and automatically stabilized Weinbridge oscillator. Partially through Dr. Terman's urging, Hewlett and Packard set up their partnership in an old garage with \$538 and the oscillator as their principal assets.

Dr. Terman died in December 1982. It is in appreciation of his accomplishments and guidance that Hewlett-Packard is proud to sponsor the Frederick Emmons Terman Award.



Kathleen Wage
George Mason University

IEEE Education Society Hewlett-Packard Harriett B. Rigas Award

For championing active learning, developing an internationally recognized assessment instrument, and cultivating a sustainable and supportive environment for female engineering faculty

Kathleen E. Wage received the B.S. degree in electrical engineering from the University of Tennessee, Knoxville, in 1990, and the S.M., E.E., and Ph.D. degrees in electrical engineering from the Massachusetts Institute of Technology/Woods Hole Oceanographic Institution Joint Program in 1994, 1996, and 2000, respectively.

Past Recipients

'95 Denise D. Denton
'96 Karan L. Watson
'97 Patricia D. Daniels
'98 Delores M. Etter
'99 Sherra E. Kerns
'00 Leah Jamieson
'01 Valerie Taylor
'02 Nan Marie Jokers
'03 Joanne Bechta Dugan
'04 Jennifer L. Welch
'06 Eve A. Riskin
'07 Bonnie Heck Ferri
'08 Cheryl B. Schrader
'09 Cynthia Furse
'10 Mari Ostendorf
'11 Karen Panetta
'12 Tanja Karp
'13 Nancy Amato
'14 Noel Schulz
'15 Sarah Rajala

In 1999 Dr. Wage joined the faculty of the Electrical and Computer Engineering Department at George Mason University in Fairfax, VA, where she is currently a tenured associate professor. Her research interests include array processing, random matrix theory, underwater acoustics, and signal processing education. As a part of her research, she participated in a number of deep water propagation experiments.

In 2009-2012, she spent 55 days at sea for the deployment and recovery cruises for the Philippine Sea experiments. During the PhilSea experiments, Dr. Wage and colleague Lora Van Uffelen (a.k.a. The Able Sea Chicks) developed a blog and videos to engage young women in ocean acoustics and engineering. She regularly leads activities for Girl Scouts at Acoustical Society of America meetings.

In addition to ocean signal processing, Dr. Wage is interested in new pedagogical methods and educational assessment. She incorporates active learning in all her courses and mentors other faculty interested in using these techniques. In collaboration with John Buck she developed the Signals and Systems Concept Inventory (SSCI), a standardized exam designed to measure conceptual understanding of linear systems. Instructors at 28 schools have administered the SSCI to over 2600 students. The exams have been translated into Spanish and Chinese.

Dr. Wage has received a number of awards for teaching, including the 2008 Mac Van Valkenburg Early Career Teaching Award from the IEEE Education Society, the 2016 Teacher of Distinction Award from George Mason University, the 2004 Outstanding Teaching Award from Mason's Volgenau School of Engineering, and the 1994 Harold L. Hazen Teaching Award from MIT's EECS Department. In 2010 she was an invited participant in the National Academy of Engineering Frontiers of Engineering Education Symposium. In addition to her teaching awards, Dr. Wage received several awards for research, including the Office of Naval Research (ONR) Young Investigator Award (2005) and the ONR Ocean Acoustics Entry-Level Faculty Award (2002). Dr. Wage is an Associate Editor for the IEEE Journal of Oceanic Engineering and chair of the IEEE Underwater Acoustic Signal Processing Workshop. She is a member of the IEEE, the Acoustical Society of America, the American Society for Engineering Education, Tau Beta Pi, Eta Kappa Nu, and Sigma Xi.

About the Rigas Award

The Harriett B. Rigas Award is presented annually to recognize outstanding faculty women who have made significant contributions to electrical and computer engineering education. The award consists of an honorarium, plaque, certificate, and Frontiers in Education Conference registration.

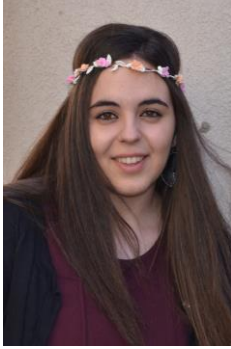
The recipient must be a tenured or tenure track woman faculty member in an ABET-accredited engineering program in the United States, with teaching and/or research specialization in electrical or computer engineering.

About Harriett B. Rigas

Dr. Harriett B. Rigas (1934-1989), an IEEE Fellow, was an electrical engineer with an international reputation for her hybrid computer and computer simulation research. At Washington State University between 1966 and 1984, she was eventually both full professor and chair of Electrical and Computing Engineering School. Later she chaired larger departments at the Navy's Postgraduate School in Monterey and, at the time of her death, Michigan State University.

Her achievements in engineering research, administration, and service were widely recognized. In 1975-76, Harriett was a Program Director at the National Science Foundation and, over the years, a member of numerous panels and advisory committees at both the NSF and the National Academy of Sciences.

Professor Rigas' success was achieved within a profession and within university administrative structures where there were very few women. Her character and courage were both evident in her strong advocacy of advancement for women. She was involved both locally and nationally in the Society of Women Engineers.



Natasha Nesiba
New Mexico State
University



Enrico Pontelli
New Mexico State
University



Timothy Staley
Onate High School

Past Recipients

- '73 Walter D. Story
- '74 Richard Hooper
- '75 John J. Alan III and
J.J. Lagowski
- '76 John Hipwell and
David Blaume

Frontiers in Education Conference Benjamin J. Dasher Best Paper Award

***DISSECT: Exploring the Relationship Between Computational Thinking and English Literature in K-12 Curricula* by Natasha Nesiba, Enrico Pontelli, and Timothy Staley**

Natasha Nesiba is a Software Engineer at Google; she earned her Bachelor's and Master's degrees in Computer Science from New Mexico State University in 2013 and 2015, respectively.

Upon graduating from Las Cruces High School in 2010, she was one of seven to receive the competitive \$10,000 Google Anita Borg Memorial Scholarship for First Years. Having her tuition cost covered by NMSU's President's Associates Excellence Scholarship and taking to heart the issue of underrepresentation of women, especially Hispanic women, Tasha donated the Google scholarship to create the Mark Nesiba Memorial Endowed Scholarship in honor of her late father. The scholarship continues to support female Hispanic students majoring in CS.

During her undergraduate studies, Natasha worked as an Undergraduate Research Assistant for Young Women in Computing, a K-12 outreach program that focuses on generating interest in CS among young female students in southern New Mexico. She was instrumental in pioneering engaging and unique outreach efforts that reached over 6,500 female students, including in-school presentations; after-school programming clubs; summer camps; city- and state-wide competitions; forums and conferences; and teacher-program collaborations.

In graduate school, Natasha was a fellow for the GK-12 DIScovering SciEnce through Computational Thinking program, where she investigated the relationship between computational thinking and English Literature. The study showed that computational thinking can be seamlessly taught within the context of an English Literature course while remaining true to the course requirements and student performance expectations. The positive assessment results suggested that computational thinking should be explicitly taught as a problem-solving mechanism within the context of all courses, especially those that are fundamental for success.

Dr. Enrico Pontelli received a Laurea in Computer Science from the University of Udine (Italy), a Masters degree in Computer Science from the University of Houston, and his Ph.D. in Computer Science from New Mexico State University. He joined the faculty at NMSU in 1997, where he raised to the rank of Regents Professor. He is currently serving as Interim Dean of the College of Arts & Sciences.

Dr. Pontelli's research interests spans several areas of Computer Science. He has done extensive research work in the field of Artificial Intelligence, with particular focus on knowledge representation and reasoning, multi-agent systems, logic programming and constraint programming. He has conducted seminal work on application of parallel and distributed computing technologies to enhance performance of logical inference systems, constraint solving systems, and automated planning algorithms. He has also conducted extensive research work in the field of bioinformatics, with particular emphasis on protein structure prediction and phyloinformatics.

Past Recipients

'77 John W. Renner
'78 Albert J. Morris
'79 Donald R. Woods,
Cameron M. Crowe,
Terrence W. Hoffman, and
Joseph D. Wright
'80 Marilla D. Svinicki
'81 Martha Montgomery
'82 A.L. Riemenschneider
and Lyle D. Feisel
'83 Davood Tashayyod,
Banu Onaral, and James M.
Trosino
'84 Bill V. Koen
'85 Bill V. Koen
'86 Richard S. Culver
'87 David A. Conner, David
G. Green, Thomas C.
Jannett, James R. Jones,
M.G. Rekoff, Jr., Dennis G.
Smith, and Gregg L. Vaughn
'88 Richard M. Felder
'89 Richard C. Compton and
Robert York
'90 Cindy A. Greenwood
'91 Robert Whelchel
'92 William LeBold and Dan
D. Budny
'93 Daniel M. Hull and
Arthur H. Guenther
'94 Burks Oakley II and Roy
E. Roper
'95 Curtis A. Carver, Jr. and
Richard A. Howard
'96 Val D. Hawks
'97 Edwin Kashy, Michael
Thoennessen, Yihjia Tsai,
Nancy E. Davis, and Sheryl
L. Wolfe
'98 A.B. Carlson, W.C.
Jennings, and P.M. Schoch
'99 Wayne Bursleson, Aura
Ganz, and Ian Harris
'00 David W. Petr
'02 Zeynep Dilli, Neil Goldsman,
Lee Harper, Steven I. Marcus, and
Janet A. Schmidt

Dr. Pontelli has led a number of efforts focused on promoting engagement and education in Computer Science, with a particular attention at broadening participation in computing for students from traditionally underrepresented groups. He is the director of the Young Women in Computing program at NMSU, which served over 13,000 students in 10 years. He also founded and led the DISSECT program, aimed at engaging teams of teachers and graduate students to infuse computational thinking in traditional K-12 courses.

Dr. Pontelli has published over 250 peer-reviewed publications and served as lead investigators for over \$13M in federal grants. He is the recipient of a NSF Career award.

Tim Staley was born in Montgomery, Alabama, in 1975. He completed a Marketing BS from the University of Alabama in 1997 and a Poetry MFA from New Mexico State University in 2004. Since 2001 he has taught Language Arts at secondary and postsecondary levels. His first full-length volume of poetry *Lost On My Own Street* was published in 2016 by Pski's Porch Publishing. His newest poetry chapbook, *The Most Honest Syllable is Shhhh*, is forthcoming from Night Ballet Press. Journal publications include *Border Senses*, *Cacti Fur*, *Canary*, *Chiron Review*, *Circumference*, *Coe Review*, *Malpais Review*, *Magnapoets*, *RHINO: The Poetry Forum*, and *Sin Fronteras*.

Since 2014 he has been involved with New Mexico State University's GK-12 DIScover SciEnce through Computational Thinking (DISSECT) program. Working closely with a fellow, he has had success integrating computational thinking strategies into his Language Arts Instruction. In 2016 he was the recipient of the Dona Ana Arts Council's *The Arts in Education Award*. He lives with his wife, daughter and two mutts in Las Cruces, New Mexico.

'03 Glenn W. Ellis, Gail E. Scordilis, and Carla M. Cook
'04 Matthew W. Ohland, Guili Zhang, Brian Thorndyke, and Timothy J. Anderson
'05 Gregory A. Moses and Michael Litzkow
'07 Donna Riley and Gina-Louise Sciarra
'08 Eric Hamilton and Andrew Hurford
'09 Steve Krause, Robert Culbertson, Michael Oehrtman, Marilyn Carlson, Bill Leonard, C.V. Hollog, and William Gerace
'10 Glenda Stump, Jenefer Husman, Wen-Ting Chung and Aaron Done
'11 Jeffrey L. Newcomer
'12 Kristi J. Shryock, Arun R. Srinivasa and Jeffrey E. Froyd
'13 Robin Adams, Alice Pawley and Brent Jesiek
'14 Hansi Keijonen, Jaakko Kurhila, Arto Vihavainen
'15 Lecia Barker and Jane Gruning

About the Dasher Award

The Benjamin Dasher Best Paper Award is given to the best paper presented at the annual Frontiers in Education Conference, as demonstrated by technical originality, technical importance and accuracy, quality of oral presentation, and quality of the written paper appearing in the Conference Proceedings. Papers are nominated for the award by reviewers.

A committee with representation from each of the organizing societies (ERM, IEEE Ed. Soc., IEEE Comp. Soc.) is formed to review nominated papers. During the FIE meeting, the committee attends presentations of the nominated papers. The committee then makes a final recommendation to the FIE Planning Committee for the Ben Dasher Award winner based on the overall quality of both the paper and the presentation.

About Benjamin J. Dasher

Benjamin J. Dasher was born December 27, 1912 in Macon, Ga. He earned his bachelor's and master's degrees in electrical engineering in 1935 and 1945, respectively, and graduated with a doctorate in electrical engineering in 1952 from the Massachusetts Institute of Technology. At MIT, Dr. Dasher worked on the electronics of instrumentation of electromechanical transducers and analog-to-digital converters. He was the author of "Dasher's method" for synthesis of resistance-capacitance two-port networks, which is found in standard textbook treatments.

While at Georgia Tech, Dr. Dasher served as a graduate assistant in 1936, then as an instructor in 1940, and became an assistant professor in 1945. While earning his PhD at MIT, he was an instructor from 1948-51. Before finishing with his PhD, he became an associate professor at Georgia Tech in 1951, was promoted to professor in 1952, and became director of the School of Electrical Engineering in 1954, where he served in that capacity until 1969. In 1968, Dr. Dasher was appointed associate dean in the College of Engineering. At Georgia Tech, Dr. Dasher served as director of network synthesis projects and transistor oscillator projects. His fields of interest included advanced network theory, electronic theory, electronic circuits, electrical engineering education, machine translation, speech analysis, and pattern recognition. He was credited for bringing undergraduate engineering education to the forefront at Georgia Tech and for increasing interactions between undergraduates and industry.

Dr. Dasher was a member of Phi Kappa Phi, ASEE, Sigma Xi, and the American Association of University Professors; he was a Fellow of both the IEEE and the Institute of Radio Engineers. He served as a regional director for IEEE and as the chair for the Atlanta section of IEEE; he was on numerous committees for IRE, AIEE, and IEEE. He served as President of the IEEE Education Group in 1970-71.

Ben Dasher organized the first Frontiers in Education Conference; it was held in Atlanta in 1971, and attracted 100 participants. There were 34 papers in six technical sessions.

Dr. Dasher died of congestive heart failure on December 13, 1971 in Houston, Texas.



James Huff
Harding University



Brent Jesiek
Purdue University



Carla Zoltowski
Purdue University



Joachim Walther
University of Georgia

Frontiers in Education Conference Helen Plants Award Best Nontraditional Session at FIE 2015

Qualitative Research on Psychological Experience: A Starting Point for Using Interpretative Phenomenological Analysis by

James Huff, Brent Jesie, Carla Zoltowski, Joachim Walther, and William Oakes

James Huff is an assistant professor of engineering and the Director of Engineering Assessment at Harding University, where he primarily teaches multidisciplinary engineering design in service-learning contexts. He conducts research using interpretative phenomenological analysis (IPA) to investigate the experienced phenomena of career identity and emotions in engineering education. Dr. Huff received his Ph.D. in engineering education and his M.S. in electrical and computer engineering, both from Purdue University. He received his bachelor's in computer engineering at Harding University.

Dr. Brent Jesiek is Associate Professor in the Schools of Engineering Education and Electrical and Computer Engineering at Purdue University. He leads the Global Engineering Education Collaboratory (GEEC) research group, and is the recipient of an NSF CAREER award to study boundary-spanning roles and competencies among early career engineers. He holds a B.S. in Electrical Engineering from Michigan Tech and M.S. and Ph.D. degrees in Science and Technology Studies (STS) from Virginia Tech. Dr. Jesiek draws on expertise from engineering, computing, and the social sciences to advance understanding of geographic, disciplinary, and historical variations in engineering education and practice.

Carla B. Zoltowski is an assistant professor of engineering practice in the School of Electrical and Computer Engineering at Purdue University. She holds a B.S.E.E., M.S.E.E., and Ph.D. in Engineering Education, all from Purdue. Prior to this she was Co-Director of the EPICS Program at Purdue where she was responsible for developing curriculum and assessment tools and overseeing the research efforts within EPICS. Her academic and research interests include the professional formation of engineers, diversity and inclusion in engineering, human-centered design, engineering ethics, leadership, service-learning, and accessibility and assistive-technology.

Dr. Joachim Walther is an associate professor of engineering education research at the University of Georgia. Dr. Walther leads a dynamic interdisciplinary research group that brings together professors, graduate, and undergraduate students from engineering, art, educational psychology, and social work. His interdisciplinary research program focuses on broader aspects of engineering professional formation, such as the role of empathy in engineering learning. Methodologically, his work draws on a wide range of qualitative approaches and he has developed and championed the Research Quality Framework (Q3 framework) as a way to foster research quality across the many interpretive research methods adopted in the engineering education community. Dr. Walther's contributions to the field have been recognized through numerous university-level, national, and international



William Oakes
Purdue University

awards. Most notably, Dr. Walther is a recipient of the Presidential Early Career Award for Scientists and Engineers (PECASE), the highest honor bestowed by the United States Government on science and engineering professionals in the early stages of their independent research careers.

William (Bill) Oakes is an instructor with both the EPICS (Engineering Projects in Community Service) and IDEAS (Introducing Diversity through Engagement and Service) learning communities. He received his BS and MS in mechanical engineering from Michigan State University. His PhD in Mechanical Engineering is from Purdue University. Oakes is recognized for going above and beyond his required role in order to benefit students in their first year at Purdue.

Past Recipients

'80 Helen Plants
'81 Jim Russell and
John C. Lindenlaub
'82 Karl A. Smith and
Harold Goldstein
'83 E. Dendy Sloan and
Charles F. Yokomoto
'84 David W. Johnson and
Karl A. Smith
'85 Billy V. Koen
'86 Martha A. Nord and
Patricia H. Whiting
'87 John C. Lindenlaub
'89 Karl A. Smith
'91 Troy E. Kostek
'92 Barbara M. Olds and
Ronald L. Miller
'93 John C. Lindenlaub and
Alisha A. Waller
'94 Billy V. Koen
'95 Burks Oakley II and
Mark Yoder
'96 Alisha A. Waller,
Edward R. Doering, and
Mark A. Yoder
'97 Karl A. Smith,
James D. Jones and
Elizabeth Eschenbach
'98 Alice Agogino
'99 Melinda Piket-May and
Julie L. Chang
'03 William C. Oakes
'04 Susan M. Lord,
Elizabeth Eschenbach,
Alisha A. Waller,
Eileen M. Cashman, and
Monica J. Bruning
'05 Ruth A. Streveler

'06 Ruth A. Streveler, Karl A. Smith, and Ronald L. Miller
'08 Maura Borrego, Lynita Newswander, and Lisa McNair
'09 Lisa C. Benson, Sherrill B. Biggers, William F. Moss, Matthew Ohland,
Marisa K. Orr, and Scott D. Schiff
'10 Russell Korte and Karl A. Smith
'11 Mark Somerville, Dave Goldberg, Sherra E. Kerns, and Russell Korte
'12 Şenay Purzer and Jonathan C. Hilpert
'13 Lynn Andrea Stein and Caitrin Lynch
'14 Stephanie Cutler, James J. Pembrige, Matthew Verleger, and Lauren D.
Thomas
'15 Rebecca Bates, Lisa Benson, Alan Cheville, Cynthia Finelli, Jennifer Karlin,
and Susan Lord

About the Plants Award

The Helen Plants Award is given for the best special (non-traditional) session at the FIE conference, as demonstrated by originality, session content and presentation including the use of written materials and visual aids, and participation of session attendees.

About Helen Margaret Lester Plants

Helen Margaret Lester was born in Desloge, Missouri, in March 1925, the only child of Rollo Bertell and Margaret Stephens Lester.

She entered the University of Missouri as a journalism major, but soon switched to Civil Engineering. She received her BSCE in 1945. She joined West Virginia University in 1947 as a graduate student and Instructor in Mechanics, and received her MS in Civil Engineering in 1953. She was a Professor of Theoretical and Applied Mechanics and of Curriculum and Instruction in the Division of Education at WVU. She became Professor Emeritus, Mechanical and Aerospace Engineering in 1983. From 1985 to 1990 she served as Chair of Civil Engineering Technology at Indiana University-Purdue University - Fort Wayne.

Her husband Ken Plants had been a "bureaucrat" with the US Bureau of Mines in Morgantown - a chemical engineer with great expertise in cost estimation. Some of their "courting" evenings were spent manually checking the design calculations on the Star City, WV Bridge, designed by the Dean and State Bridge Engineer. While in Morgantown, Helen was active in Trinity Episcopal Church where she served as a Vestryman and Bishop's Man. For many years she was a Girl Scout leader. Helen died in Tulsa, Oklahoma in September 1999.

From the beginning of her academic career, she was a gifted teacher and a role model for the few women students at West Virginia University at that time. Later, she became an advocate of programmed and individualized instruction. She and Wally Venable wrote series of papers on these topics and several texts: *Introduction to Statics, a Programmed Text*, (1975), *A Programmed Introduction to Dynamics* (1967), and *Mechanics of Materials, A Programmed Textbook* (1974). She established the first doctoral program in Engineering Education at West Virginia University.

In 1975, the University of Missouri at Columbia recognized her with the Missouri Honor Award for Distinguished Service in Engineering. She became an ASEE Fellow in 1983 as a member of the first class of Fellows. She also received Distinguished Service Award, Western Electric Fund Award, and was an ASEE Vice-President (1974 – 1976).



Melany Ciampi
COPEC

Past Recipients

'84 Carol Schmitz
'85 Lawrence P. Grayson
'86 John C. Lindenlaub
'87 George Burnett
'88 James R. Rowland
'89 Lyle D. Feisel
'90 Edwin C. Jones, Jr.
'92 Karl A. Smith
'92 Victor K. Schutz
'93 Bruce A. Einstein
'94 David V. Kerns, Jr.
'95 David R. Voltmer
'96 William E. Sayle II
'97 Richard S. Culver
'98 Dan Budny
'99 Robert J. Herrick
'00 Larry J. Shuman
'01 David L. Soldan
'02 Goranka Bjedov
'03 Larry G. Richards
'04 James A. Roberts
'05 Robert J. Hofinger
'06 Jane Chu Prey
'07 Joseph L. A. Hughes
'08 Ted E. Batchman
'09 Russ Meier
'10 Dan Moore
'11 Susan M. Lord
'12 Arnold Pears
'13 Jennifer Karlin
'14 Cynthia Finelli
'15 Robert Hofinger

Frontiers in Education Conference Ronald J. Schmitz Award

For outstanding service to the Frontiers in Education Conference

Dr. Melany M. Ciampi is a Professor of Electrical and Computer Engineering. She has served as the International Chair of Frontiers in Education Annual Conference (FIE) since 2003 and is Secretary of Education Society of the IEEE (IEEE-EdSoc). She has participated as a member of committees in more one hundred international conferences and journals. She has also taught courses and lectures in five continents in over 30 different countries. Currently she is the President of World Council on System Engineering and Information Technology (WCSEIT), President of Safety Health and Environment Research Organization (SHERO), President of World Council on Communication and Arts (WCCA), Vice-President of Sciences and Education Research Council (COPEC), Vice- President of Fishing Museum Friends Society (AAMP) and. She is also Chair of Intersociety Cooperation Committee of Education Society of the IEEE (IEEE-EdSoc) since 2011, Co-Chair of Working Group "Ingenieurpädagogik im Internationalen Kontext" in IGIP (Internationale Gesellschaft für Ingenieurpädagogik) since 2002, Member of Strategic Planning Committee of Education Society of the Institute of Electrical and Electronics Engineers, Inc (IEEE-EdSoc) since 2009 and Board Member of "Global Council on Manufacturing and Management" (GCMM) since 2004. She is Member of Board of Governors of International Council for Engineering and Technology Education (INTERTECH) since 2000, Member of Board of Governors of Education Society of the Institute of Electrical and Electronics Engineers, Inc (IEEE-EdSoc) since 2000 and Member of Board of Governors of World Council on System Engineering and Information Technology (WCSEIT) since 2012. She was Vice-President of "Internationale Gesellschaft für Ingenieurpädagogik" (IGIP), President of Brazilian Chapter of Education Society of the Institute of Electrical and Electronics Engineers, Inc (IEEE-EdSoc), Member of Executive Committee of IGIP, State Councilor of Brazilian Association for the Advancement of Science (SBPC) and Manager of International Relations of SENAC School of Engineering and Technology. She is Member of IGIP (International Society for Engineering Education), SEFI (European Society for Engineering Education), ASEE (American Society for Engineering Education), INTERTECH (International Council for Engineering and Technology Education) and RCI (Cartagena Network of Engineering). She was the first American woman Professor to receive the title of "International Engineering Educator" of IGIP. She received numerous honors due to his services to Scientific Commonwealth and Technological Cooperation among them: Award of the International Council on Engineering and Technology Education, Award from the International Council on Engineering and Computer Education, Award of Recognition of International Society for Engineering Education and Medal of Brazilian Association of Civil Engineers. She is Senior Member of IEEE. She received the IEEE Edwin C. Jones Jr. Meritorious Service Award of 2011. She has over one hundred and fifty published articles in several conferences and journals.

About the Schmitz Award

The Ronald Schmitz Award is given to recognize outstanding and continued service to engineering education through contributions to the Frontiers in Education Conference.

About Ronald J. Schmitz

Ronald J. Schmitz was born near Ionia, Iowa on April 25, 1934. He attended a one-room country school through the eighth grade and then, as was not uncommon at the time, decided to forgo high school and work on his father's farm. At age 18, he joined the United States Navy. He served as an Electricians Mate, spending much of his enlistment at sea and made a round-the-world cruise aboard the USS Saipan.

In the Navy, Ron found an interest in and an aptitude for technology and recognized the need for further education. He completed a GED program in the Navy and, when he was discharged, enrolled in electrical engineering at Iowa State University. He received all his degrees there, finishing his doctorate in 1967.

In the fall of 1967, he accepted appointment as Assistant Professor in the Department of Electrical Engineering at the South Dakota School of Mines and Technology in Rapid City. He was involved in various research activities and directed both masters and doctoral students, but his strongest interest was always in teaching. Ron was a consummate teacher, patient with students who were having difficulty but intolerant of sloth. He received the School of Mines Teaching Award in 1975 and the Western Electric Fund Award for Excellence in Teaching in 1981.

Dr. Schmitz was very active in the IEEE, especially the Education Society, and served as Secretary Treasurer of the Society. He was also active in ERM and attended, and contributed to, many Frontiers in Education Conferences. He served as general chair of FIE 1981 in Rapid City.

Ron was an avid hunter and fisherman, a devoted husband and father and a faithful friend. He served his church as Lector and Lay Minister and was active as a Boy Scout leader.

Ron contracted cancer in 1983 and died on July 19, 1984.



Susan Lord
University of San Diego

Past Recipients

'79 Lawrence P. Grayson
'80 Demetrius T. Paris
'81 Lindon E. Saline
'82 Anthony B. Giordana
'83 Joseph Bordogna
'84 John C. Lindenlaub
'85 John D. Ryder
'86 James R. Rowland
'87 Bruce Eisenstein
'88 Mac Van Valkenburg
'89 Edward W. Ernst
'90 Ernst Weber
'91 J. David Irwin
'92 Jerrier A. Haddad
'93 Chalmers F. Sechrist
'94 Eric A. Walker
'95 Stephen W. Director
'96 William H. Hayt, Jr.
'97 Jerry R. Yeargan
'98 Ted E. Batchman
'99 Lyle D. Feisel
'00 Irene C. Peden
'01 Donald E. Kirk and
Eli Fromm
'02 Burks Oakley II
'03 Frank Barnes and
Delores Etter
'04 William E. Sayle II
'05 H. Vincent Poor
'06 George D. Peterson
'07 Sarah A. Rajala and
Marwan A. Simaan
'08 James A. Roberts
'09 Jose B. Cruz, Jr.
'10 Rob Reilly
'11 Susan E. Conry
'12 Theodore Rappaport
'13 Karen Panetta
'14 Raghunath K.
Shevgaonkar
'15 Marco Winzker

IEEE Education Society William E. Sayle II Award for Achievement in Education

For contributions to educational pedagogy, diversity, and leadership in engineering education

Susan M. Lord is Professor and Chair of Electrical Engineering, University of San Diego (USD). She received a B.S. from Cornell University and the M.S. and Ph.D. from Stanford University. Her research focuses on the study and promotion of diversity in engineering including student pathways, diverse populations including Latinos and military veterans, and cross-cultural studies with non U.S. students. Her research has been sponsored by the National Science Foundation (NSF). Dr. Lord and Dr. Michelle Madsen Camacho are among the first to study Latinos in engineering. In reviewing their 2013 book, *The Borderlands of Education: Latinas in Engineering*, Dr. Riley, Smith College, called it “groundbreaking work...that will challenge your assumptions about women and minorities in engineering”. Dr. Walden, University of Oklahoma said “This book should be high on the must-read list for engineering educators at all levels, from first-year faculty to deans.” Dr. Lord is a Fellow of the IEEE and ASEE and is active in the engineering education community including serving as General Co-Chair of the 2006 Frontiers in Education (FIE) Conference, on the FIE Steering Committee, and as President of the IEEE Education Society for 2009-2010. She is an Associate Editor of the IEEE Transactions on Education. She and coauthors received the 2011 Wickenden Award for the best paper in the Journal of Engineering Education and the 2011 Best Paper Award for the IEEE Transactions on Education. Dr. Lord spent a sabbatical in 2012 at Southeast University in Nanjing, China teaching and doing research. Dr. Lord is currently on the USD team implementing “Developing Changemaking Engineers”, an NSF-sponsored Revolutionizing Engineering Education (RED) project.

About the Sayle Award and William E. Sayle II

The William E. Sayle II Award is presented to recognize a member of the IEEE Education Society who has made significant contributions over a period of years in a field of interest of the IEEE Education Society. The award consists of a plaque, a certificate, and paid registration to the Frontiers in Education Conference.

Dr. William (Bill) E. Sayle received his BSEE and MSEE degrees from the University of Texas at Austin and his Ph.D. from the University of Washington. He joined the faculty in electrical engineering at Georgia Institute of Technology in 1970, just as Georgia Tech was beginning the transition from an undergraduate institution to a research university. He was the ECE associate chair for undergraduate affairs from 1988-2003 and, following retirement in 2003, served as director of undergraduate programs at Georgia Tech-Lorraine in France until 2007. Bill was a tireless advocate for students, putting in countless late night and weekend hours in addressing student issues, assigning teaching assistants, and meeting with prospective students and parents.

Throughout his career, Bill touched the lives of many people in the worldwide academic community. He was a leader and a pioneer in many areas. In the 1970s, he was a founding member of the IEEE Power Electronics Society, where he served in many leadership roles over the years. He was a champion of diversity and in recruiting underrepresented minorities and women to engineering and science, long before it became a national issue. He visited many high schools on behalf of the Southeastern Consortium for Minorities in Engineering, a role where he made many friends for Georgia Tech among high school administrators and students in the southern part of Georgia.

In his 30-year career at Georgia Tech, Bill received the ECE outstanding teacher award twice, as well as the Georgia Tech outstanding teacher award and outstanding service award. Bill lent his voice and efforts to Georgia Tech faculty governance throughout his career, serving as an elected member of Institute-level committees, the Academic Senate, and the Executive Board.

Bill was a long-time member and active volunteer in the IEEE Education Society and the Electrical and Computer Engineering Division of ASEE. He was a Fellow of both IEEE and ASEE. He was the recipient of the Education Society's 2001 Meritorious Service Award and 2004 Achievement Award and of the ECE Division's 2001 Meritorious Service Award and 2006 ECE Distinguished Educator Award. Bill was the General Chair of the 1995 Frontiers in Education (FIE) Conference, which is still remembered for its all-vegetarian menu, and received the 1996 Ronald J. Schmitz Award for outstanding service to FIE.

Much of Bill's professional career was devoted to engineering accreditation, serving at various times as member and chair of the IEEE Committee on Engineering Accreditation Activities and the IEEE Accreditation Policy Council. He participated in more than 20 visits as a program evaluator, in addition to serving as a team chair and member of the Engineering Accreditation Commission of ABET for more than five years. Bill received the IEEE Educational Activities Board Meritorious Achievement Award in Accreditation Activities in 2004.

Dr. Sayle passed away on February 2, 2008.



Jana Reisslein
Arizona State
University



Amy M. Johnson
Arizona State
University



Martin Reisslein
Arizona State
University

IEEE *Transactions on Education* Theodore E. Batchman Best Paper Award

***Color Coding of Circuit Quantities in Introductory Circuit Analysis Instruction*, Jana Reisslein, Amy M. Johnson, and Martin Reisslein, IEEE Transactions on Education Vol. 58, No. 1, February 2015, pp. 7-14**

Jana Reisslein received the Ph.D. degree in educational technology from Arizona State University (ASU), Tempe, in 2005 and the M.A. in Psychology from Palacky University, Czech Republic, in 2000. She was an instructional designer with Information Technology, Intel Corporation, from 2005 – 2007 and an instructional technologist with Business Information Technology, ASU, from 2007 – 2008. Since 2012 she has been an educational consultant and evaluator with the Fulton Schools of Engineering at ASU.

Amy Johnson is an Assistant Research Professor in the Science of Learning and Educational Technology (SoLET) Lab the Learning Sciences Institute at Arizona State University ASU), Tempe. She joined ASU as an Assistant Research Scientist in the School of Electrical, Computer, and Energy Engineering after having received her PhD in Cognitive Psychology from the University of Memphis in 2011. Her research interests concern learners' knowledge construction through integration of textual and pictorial information within multimedia and hypermedia environments, the use of multiple representations of information during regulating one's learning, and the use of animated pedagogical agents during learning. She is a member of the American Educational Research Association, Cognitive Science Society, International Artificial Intelligence in Education Society, American Society for Engineering Education, and Research in Engineering Education Network.

Martin Reisslein (A'96-S'97-M'98-SM'03-F'14) is a Professor in the School of Electrical, Computer, and Energy Engineering at Arizona State University (ASU), Tempe. He received the Ph.D. in systems engineering from the University of Pennsylvania in 1998. Martin Reisslein served as Editor-in-Chief for the IEEE Communications Surveys and Tutorials from 2003-2007 and as Associate Editor for the IEEE/ACM Transactions on Networking from 2009-2013. He currently serves as Associate Editor for the IEEE Transactions on Education as well as Computer Networks and Optical Switching and Networking. Martin Reisslein received the U.S. National Science Foundation Career Award in 2002 and the Friedrich Wilhelm Bessel Research Award from the Alexander von Humboldt Foundation in 2015.



Susan Lord
University of San Diego



Richard Layton
Rose-Hulman Institute



Matthew Ohland
Purdue University

IEEE Transactions on Education Theodore E. Batchman Best Paper Award

***Multi-Institution Study of Student Demographics and Outcomes in Electrical and Computer Engineering in the USA*, Susan Lord, Richard Layton, and Matthew Ohland, IEEE Transactions on Education Vol. 58, No. 3, August 2015, pp. 141-150**

Susan M. Lord is Professor and Chair of Electrical Engineering, University of San Diego (USD). She received a B.S. from Cornell University and the M.S. and Ph.D. from Stanford University. Her research focuses on the study and promotion of diversity in engineering including student pathways, diverse populations including Latinos and military veterans, and cross-cultural studies with non U.S. students. Her research has been sponsored by the National Science Foundation (NSF). Dr. Lord and Dr. Michelle Madsen Camacho are among the first to study Latinos in engineering. In reviewing their 2013 book, *The Borderlands of Education: Latinas in Engineering*, Dr. Riley, Smith College, called it “groundbreaking work...that will challenge your assumptions about women and minorities in engineering”. Dr. Lord is a Fellow of the IEEE and ASEE and is active in the engineering education community including serving as General Co-Chair of the 2006 Frontiers in Education (FIE) Conference, on the FIE Steering Committee, and as President of the IEEE Education Society for 2009-2010. She is an Associate Editor of the IEEE Transactions on Education. She and coauthors received the 2011 Wickenden Award for the best paper in the *Journal of Engineering Education* and the 2011 Best Paper Award for the IEEE Transactions on Education. Dr. Lord spent a sabbatical in 2012 at Southeast University in Nanjing, China teaching and doing research. Dr. Lord is currently on the USD team implementing “Developing Changemaking Engineers”, an NSF-sponsored Revolutionizing Engineering Education (RED) project.

Richard Layton is a Professor of Mechanical Engineering at Rose-Hulman Institute of Technology. His areas of scholarship include student teaming, longitudinal studies of engineering undergraduates, and data visualization. With his collaborators, he has been recognized with the best paper in the *Journal of Engineering Education* in 2008 and 2011 and in *IEEE Transactions on Education* in 2011. His teaching practice includes formal cooperative learning and integrating communications, ethics, and teaming across the curriculum. He is a founding developer of the CATME system, a free, web-based system that helps faculty assign students to teams and conduct self- and peer-evaluations. He is a co-author of the *Engineering Communication Manual*, a recent technical communication text designed specifically for engineering students. He can occasionally be found playing guitar at a local open mic.

Matthew Ohland is a Professor of Engineering Education at Purdue University. His research on the longitudinal study of engineering student development, team formation, peer evaluation, and extending the use of active and cooperative learning has been supported by the National Science Foundation and the Sloan Foundation. With his collaborators, he has been recognized with the best paper in the *Journal of Engineering Education* in 2008 and 2011 and in *IEEE Transactions on Education* in 2011 in addition to multiple conference best paper awards. Dr. Ohland is a Fellow of the American Society of Engineering Education and IEEE and has served on the IEEE Education Society Board of Governors (2007-2013), an Associate Editor of *IEEE Transactions on Education*, Chair of the Educational Research and Methods division of ASEE (2009-2011), as a Program Evaluator for ABET, and the 2002–2006 President of Tau Beta Pi.



Kayode P. Ayodele
Obafemi Awolowo
University



Isaac A. Inyang
University of the
Western Cape



Lawrence O. Kehinde
Obafemi Awolowo
University

IEEE Transactions on Education Theodore E. Batchman Best Paper Award

An iLab for Teaching Advanced Logic Concepts With Hardware Descriptive Languages, Kayode P. Ayodele, Isaac A. Inyang, and Lawrence O. Kehinde, *IEEE Transactions on Education* Vol. 58, No. 4, November 2015, pp. 262-268

Dr. Kayode P. Ayodele is a Senior Lecturer and Head of the Department of Electronic and Electrical Engineering, Obafemi Awolowo University, Nigeria. His current research interests include acquisition and processing of neurophysiological signals for brain-machine interfaces, and the development of remote laboratories and other pedagogical tools for engineering education. He was a winner of the MIT iLab Junior Research Fellowship and the MIT-Total Empowering the Teachers Fellowship in 2010 and 2013 respectively. He serves as a reviewer for many journals. Dr. Ayodele is a member of the IEEE and the Society for Neuroscience.

Dr. Isaac Anietye Inyang's areas of research include telemedicine, data science and virtual instrumentation. Dr. Inyang is a member of the IEEE, a corporate member of the Nigerian Society of Engineers, and a registered engineer with the Council for the Regulation of Engineering in Nigeria. Dr. Inyang is a co-founder and CEO Ansyl Software Engineering Limited in Nigeria. He is also a member of the Intelligent Systems and Advanced Telecommunication Research Group at the University of the Western Cape, South Africa. He has co-authored journal articles in reputable journals.

Professor Lawrence Kunle Kehinde, a former Engineering Dean and University Deputy Vice Chancellor, received his B.Sc 1st class Hons in Electronics (1971) at Obafemi Awolowo University (OAU), Ile-Ife, Nigeria, and a D.Phil, Control Engineering (1975), at the University of Sussex UK. He had his Post-Doctoral Studies in Nuclear Instrumentation at University of California, Berkeley USA (1977-1978) as an IAEA Fellow. He has spent most of his years as a Professor of Instrumentation Engineering at the Obafemi Awolowo University, Ile-Ife, Nigeria. He was the Rector of the first private Polytechnic in Nigeria. A few years back, he concluded a 3-year Visiting Professor term at the Texas Southern University, Houston Texas USA. He has worked in Techno-Managerial position as the Director of ICT at OAU for years. His major field is Instrumentation Designs and has designed equipment, two of which had received British patents in the past. He has published over 90 academic publications. He was the founding Principal Investigator of the University's iLab research and he currently designs remote and virtual experiments for remote experimentation. He is a Chartered Engineer, a Fellow of the Computer Professional Nigeria and a member of IEEE and ASEE.

About the Award

This award recognizes the best paper published each year in the IEEE Transactions on Education, as evaluated on originality, quality, advancement of the art, and effectiveness of presentation in terms of clarity of exposition and coherence.

About Theodore E. Batchman

Ted E. Batchman received his B.S.E.E., M.S.E.E. and Ph.D. degrees from the University of Kansas in 1962, 1963 and 1966, respectively. After working four years in the aerospace industry, he began his academic career at the University of Queensland in Brisbane, Australia (1970-75) where he was involved in optical systems and devices research. He then returned to the USA and assumed a position at the University of Virginia (1975) where he continued his research in electro-optics and semiconductors. In 1988 he moved to the University of Oklahoma to become the Chair of the Electrical Engineering Department, and then in 1995 he moved to the University of Nevada, Reno as Dean of the College of Engineering. He is currently founding director of the Renewable Energy Center at the University of Nevada, Reno. He has been a department chair and dean of engineering for the past 20 years. He was program co-chair of FIE 2000 and general chair of FIE 2001. He has served on the FIE Steering Committee for the past six years and was chair of the FIE Steering Committee in 2007/2008.

He is a fellow of the IEEE and ASEE, recipient of the IEEE Third Millennium Medal, IEEE Education Society 1998 Achievement Award, IEEE Education Society 2000 Meritorious Service Award, is a past member of the IEEE Education Activities Board (EAB) and past chair of the EAB Pre-college Education Committee, a member of the IEEE Education Society Administrative Committee and was editor-in-chief of the IEEE Transactions on Education from January 1997 to January 2001. He is a member of Eta Kappa Nu and Tau Beta Pi.

Past Recipients

- '99 J.A. Buck, H. Owen, J.P. Uyemura, C.M. Verber, and D.J. Blumenthal
- '00 David J. Russomanno and Ronald D. Bonnell
- '01 Christopher W. Trueman
- '02 Mohan Krishnan and Mark J. Paulik
- '03 Tyson S. Hall, James O. Hamblen, and Kimberly E. Newman
- '04 M. Brian Blake
- '04 Russell L. Pimmel
- '05 Antonio J. Lopez-Martin
- '06 Euan Lindsay and Malcolm C. Good
- '07 Jason A. Day and James D. Foley
- '08 France Bélanger, Tracy L. Lewis, George M. Kasper, Wanda J. Smith and K. Vernard Harrington
- '09 Kenneth Ricks, Jeff Jackson, and William A. Stapleton
- '10 Keith Holbert and George G. Karady
- '11 Julie A. Rursch, Andy Luse, and Doug Jacobson
- '12 Susan Lord, Richard Layton, and Matthew Ohland
- '13 Benjamin Hazen, Yun Wu, and Chetan Sankar
- '14 James McLurkin, Joshua B. Rykowski, Meagan John, Quillan Kaseman, and Andrew J Lynch
- '15 Raghu Raman, Krishnashree Achuthan, Prema Nedungadi, Shyam Diwakard, and Ranjan Bose



Chapter Chair
Sasha Nikolic

Past Recipients

'06 Nordic Chapter
'07 Spanish Chapter
'08 Gulf Chapter
'09 Santa Clara Valley
Chapter and
Portugal Chapter
'10 Austria Chapter
'11 Spain Chapter
'12 Hong Kong Chapter

IEEE Education Society Chapter Achievement Award

For experiencing an 80% increase in membership across two years through frequent innovative technical meetings, supporting women in engineering education and providing development opportunities to teaching assistants.

Sasha Nikolic (M'14-SM'15) is a Lecturer in Engineering Education at the University of Wollongong, where he is also a Fellow of the Wollongong Academy of Tertiary Teaching and Learning Excellence (WATTLE). He was previously a Laboratory Manager at the same university, and before that worked in operations analysis and telecommunications support in the banking and financial services industry. He is Chair of the New South Wales Chapter of the IEEE Education Society. He won a university Outstanding Contribution to Teaching and Learning Award in 2011. In 2012, he was awarded a Citation for Outstanding Contributions to Student Learning as part of the Australian Awards for University Teaching.

Vice Chair, Christian Ritz

Past Chair, Jun Shen

Secretary, Peter Vial

Women in Engineering Education, Azadeh Safari

General Member, Graeme Gwilliam



Francisco Arcega
University of Zaragoza

Past Recipients

- '06 Michael E. Auer and
Manuel Castro
- '07 Carlos Rueda
Artunduaga and
Oliver K. Ban
- '08 Bakr Hassan and
Edmundo Tovar
- '09 Emmanuel A. Gonzalez
- '10 Martín Llamas-Nistal
- '11 Russ Meier
- '12 German Cabuya
- '15 Rosanna Yuen-Yan
Chan

IEEE Education Society Distinguished Chapter Leadership Award

For innovative and dedicated leadership of professional activities

Francisco J. Arcega (M'80–SM'05) was born in Caspe (Zaragoza), Spain. He received the M.Sc. in Physics in 1976 and PhD in Physics in 1981 at the University of Zaragoza, Spain. In 1976 he joined the Electronics Department at the University of Zaragoza and since 1982 he is in the Electrical Engineering Department where he is currently Professor (CEU). His main research interests are in the field of electrical measurements and their applications in the industry field. As well, he is involved with quality in the education and in the laboratory activities. He is co-director of the research group EduQTech devoted to research and use the quality in education and in technology.

Dr. Arcega has been Director of the Department of Electrical Engineering and later Dean of the Faculty of Engineering (EUITIZ) at the University of Zaragoza (2004-2009).

He is member of the Directive of the Spanish Chapter of the Education Society of the IEEE and he has been Chair of the Chapter (2014-2015).

He has published about one hundred of papers in education and in Electrical Engineering mainly in aspects related with Quality and Measurements. He has published a book on Sensors and one in Metrology. He is reviewer of several technical journals and conferences

Since 1997 he is Director of the Laboratory of Electrical Measurements (LME), accredited by the Spanish National Accreditation Body (ENAC) for calibration Electricity and for testing Electrical parameters of Power Plants. As well he is Technical Expert for the accreditation of Testing Laboratories in Electrical Safety and Electromagnetic Compatibility acting for the Spanish, French and Italian Accreditation Bodies. As well, he has been auditing engineering university Faculties for Diplomas (Degree and Master) and Doctorate level for the Spanish National Agency for Accreditation (ANECA) and he is a Program Evaluator for the Accreditation Board for Engineering and Technology (ABET).



Michael Auer
Carinthia University of
Applied Sciences

Past Recipients

- '05 Marion O. Hagler and
Burks Oakley II
- '06 Ted Batchman and
David A. Conner
- '08 David L. Soldan
- '10 Manuel Castro
- '11 Susan M. Lord
- '12 Matthew Ohland
- '13 Victor Nelson
- '15 Jeffrey Froyd

IEEE Education Society Distinguished Member Award

*For to the growth and sustained development of Engineering
Education throughout the world*

Dr. (mult) Michael E. Auer is Vice-Rector and Professor of Electrical Engineering at Carinthia University of Applied Sciences Villach and Professor for Microelectronics at University of Klagenfurt, Austria. His current research is directed to technology enhanced learning and remote working environments especially in engineering.

He is author or co-author of more than 190 publications and leading member of numerous national and international organizations in the field of Online Technologies.

Michael Auer is founder and chair of the annual international IEEE EDUCON, ICL and REV conferences and chair or member of the Program Committees of several international conferences and workshops.

He works as an evaluator and coordinator of European Union funded research projects and is member in expert groups of the European Commission as well as US NSF.

He is an IEEE member since 1999 and has the grade of a Senior member.

Michael Auer is Founding-President and CEO of the "International Association of Online Engineering" (IAOE) since 2006, a non-governmental organization that promotes the vision of new engineering working environments worldwide. In 2009 he was appointed as member of the Advisory Board of the European Learning Industry Group (ELIG).

Furthermore, he is one of the founders and Secretary General of the "Global Online Laboratory Consortium" (GOLC). GOLC is the result of an initiative started in 2009 at MIT to coordinate the work on educational Online Laboratories worldwide.

From 2010 - 2016 he served as President of the "International Society of Engineering Education" (IGIP).

During the World Engineering Education Forum (WEEF2015) he was elected as President of the International Federation of Engineering Education Societies (IFEES) for 2016 - 2018.



Lance Pérez
University of Nebraska

Past Recipients

'78 Warren B. Boast
'79 Joseph M. Biedenbach
'80 Edwin C. Jones, Jr.
'81 Lyle D. Feisel
'82 Roy H. Mattson
'83 Robert F. Fontana
'84 Gerald R. Peterson
'85 Luke H. Noggle
'86 James A. Mulligan
Sidney S. Shamis
'87 Thomas K. Gaylord
'88 Robert F. Cotellessa
'89 E. Ben Peterson
'90 Darrell L. Vines
'91 Victor K. Schutz
'92 William K. LeBold
'93 Frank S. Barnes
'94 Patricia D. Daniels
'95 Robert W. Ritchie
'96 Marion O. Hagler
Donald E. Kirk
'97 Robert Sullivan
'98 Burks Oakley II
'99 Gerald L. Engel
'00 Ted E. Batchman
'01 William E. Sayle II
'02 James Rowland
'03 David A. Conner
'04 Trond Clausen
'05 J. David Irwin
Rodney J. Soukup
'06 Robert A. Reilly
'07 David V. Kerns, Jr.
'08 James J. Sluss, Jr.
'09 Manuel Castro
'10 Michael E. Auer
'11 Russ Meier
'11 Claudio da Rocha Brito
and Melany M. Ciampi
'12 Susan Lord

IEEE Education Society Edwin C. Jones, Jr. Meritorious Service Award

For sustained contributions to the Education Society including serving as Treasurer.

Dr. Lance C. Pérez has been a faculty member in the Department of Electrical and Computer Engineering at the University of Nebraska-Lincoln (UNL) since August 1996 where he holds the rank of Professor. He received his BS degree in electrical engineering from the University of Virginia and his MS and PhD degrees in electrical engineering from the University of Notre Dame. In 1995 he was a postdoctoral fellow with the Institute for Signal and Information Processing at the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland. Dr. Pérez's research interests are in the areas of wireless communications, signal and image processing, and engineering education and leads the Perceptual Systems Research Group with funding from NSF, NASA and other federal agencies. He was the recipient of a NSF CAREER award and has been the PI or co-PI on over fifteen million dollars of federally funded grants. While at UNL he has received many teaching awards including the university's College Outstanding Teaching Award. Dr. Pérez is the co-author with Dr. Christian B. Schlegel of the book *Trellis and Turbo Codes*.

From August 2008 to August 2010, Dr. Pérez was a Program Director in the Division of Undergraduate Education (DUE) at the National Science Foundation (NSF) where he worked on the Federal Cyber Service: Scholarship for Service (SFS) program, the Course, Curriculum and Laboratory Improvement (CCLI) program, the Advanced Technology Education (ATE) program and the Math and Science Partnership (MSP) program. He is currently on the board of directors of Unizin and WEPAN and serves as a member at large of the IEEE Education Society Board of Governors.

Dr. Pérez is currently the Interim Dean of the College of Engineering at the University of Nebraska-Lincoln.

'13 Charles Fleddermann
'14 Danilo G. Zutin
'15 Victor P. Nelson

About the Edwin C. Jones Award

The Edwin C. Jones Meritorious Service Award is presented to recognize a member of the IEEE Education Society who has made pioneering contributions to the administrative efforts of the IEEE Education Society over a period of years. The award consists of a plaque, a certificate, and registration to the Frontiers in Education Conference.

About Edwin C. Jones

Professor Jones served as a Society officer from 1970 through 1976; this service included two years as president. He served as Editor-in-Chief of the IEEE Transactions on Education from 1982-84. Since he first became involved in the Society in the late 1960s, he has held virtually every office in the Education Society. He is still actively involved with the Education Society. Professor Jones also served the IEEE as a member of the IEEE Committee on Engineering Accreditation Activities. Dr. Jones is University Professor and Associate Chair, emeritus, Department of Electrical and Computer Engineering, Iowa State University. Prior to joining Iowa State in 1966, he was an Assistant Professor at the University of Illinois from 1962-66. He received his PhD in 1962 from the University of Illinois; the DIC in 1956 from Imperial College of Science and Technology, University of London; and the BSEE in 1955 from West Virginia University. Dr. Jones' honors and awards include: Fellow, Institute of Electrical and Electronics Engineers; Fellow, American Society for Engineering Education; Fellow, American Association for Advancement of Science; Fellow, Accreditation Board for Engineering and Technology; IEEE Centennial Medal, 1984; ASEE Centennial Medal, 1993. Some of his ISU Honors Program students have started and endowed an undergraduate scholarship at Iowa State University in his honor.



Katherine Shu-Min Li
National Sun Yat-sen
University

Past Recipients

'04 Parham Aarabi
'05 John R. Buck
'06 Lisa G. Huettel
'07 Susan C. Hagness
'08 Kathleen E. Wage
'09 Min Wu
'10 Craig Ziles
'11 Jonathan Makela
'12 Babak Ayazifar
'13 Muhammad Zaman
'14 Jill Nelson
'15 Chengying Xu

IEEE Education Society Mac Van Valkenburg Early Career Teaching Award

For her adoption of creative teaching methodology, interactive learning, and project based learning techniques and for attracting students to interdisciplinary programs in design that lead to patentable product development.

Katherine Shu-Min Li (Senior Member IEEE) received the B.S. degree from Rutgers University, New Brunswick, NJ, and the M.S. and Ph.D. degrees from National Chiao Tung University, Hsinchu, Taiwan, in 2001 and 2006, respectively. She currently a Full Professor with the Department of Computer Science and Engineering, National Sun Yat-Sen University, Kaohsiung, Taiwan.

Her current research interests include Interposer Test, 2.5D/3D/SiP IC Test, Microfluidic Chip Synthesis & Test, Hardware Trojan, Side Channel Effect, Design for Security (DfS), Machine Learning & Big Data, Crosstalk Effects, Signal & Power Integrity, SOC testing, Floorplanning and Routing for Testability and Yield Enhancement, Design for Yield (DfX), Scan Reordering, Scan Routing, Low-Power Scan Technologies, particularly on Oscillation Ring Test Schemes, and Interconnect Optimization. Her recent research involves cross-field exploration in research field of IC Design & Test, Electronics Design Automation (EDA), Computer Integrated Manufacturing (CIM), Computer Aided Design (CAD) and Computer Aided Engineering (CAE), especially High Frequency Trading (HFT) in FinTech.

Dr. Li is a member of the IEEE Education and IEEE Circuits and Systems Societies, Association for Computing Machinery (ACM), and ACM Special Interest Group on Design Automation, and IEEE Women in Engineering (WIE).



Krishna Priya S.L
St. Xavier's Catholic
College of Engineering

Past Recipients

- '05 Marion O. Hagler and
Burks Oakley II
- '06 Ted Batchman and
David A. Conner
- '08 David L. Soldan
- '10 Manuel Castro
- '11 Susan M. Lord
- '12 Matthew Ohland
- '13 Victor Nelson
- '15 Jeffrey Froyd

IEEE Education Society Student Leadership Award

For emblematic leadership in the execution of programs and continuous improvements of the IEEE Education Society Student Chapter and for tremendous improvement in imparting technical education.

S.L. Krishna Priya is one of the Members of IEEE who completed her Bachelor of Engineering Degree in the Department of Electronics and Communication from St. Xavier's Catholic College of Engineering. She is one among the active volunteers of IEEE Madras Section. She is an Immediate Past Chairperson of IEEE Education Society Student Branch Chapter (STB62851). She is a member of IEEE WIE Affinity Group, IEEE Education Society, IEEE Computer Society, IEEE SSIT. She is also a member of IET.

She has more than 2 years of volunteering experience in IEEE. She has played an active role in making the IEEE Education Society Student Branch Chapter vibrant in St. Xavier's Catholic College of Engineering. She has been proffered the prestigious Richard. E. Merwin Scholarship Award in the year 2016 given by IEEE Computer Society for her exemplary works towards IEEE. She is also serving as the active volunteer of IEEE Education Society, Madras Section and IEEE Nagercoil Hub Congress. She and her team along with staff members has won the UPP (University Partnership Program) mini project funding for their proposal on Improvement of Education in Kanyakumari District in 2015.

She has also done well through her academics maintaining an excellent CGPA and was granted the toppers award for three consecutive years. In recognition of her achievements in Academic, Co-curricular and Extra-curricular activities she has been awarded the Best Outgoing student award from the Department of Electronics and Communication Engineering and Women Cell of St. Xavier's Catholic College of Engineering. She has volunteered in organizing all activities of IEEE STB62851 and other activities of IEEE.

Newly Elected IEEE Fellows



John Heywood is author of “Engineering Education: Research and Development in Curriculum and Instruction” which received the 2006 award for the best research publication from the Division for the Professions of the American Educational Research Association. He has just published “The Assessment of learning in engineering education. Practice and Policy.” He is a Fellow of the American Society for Engineering Education and a Fellow of the Institute of Electrical and Electronic Engineers. Before he retired he was Professor and Director of teacher education in the University of Dublin and is author of “Instructional and Curriculum Leadership: Toward Inquiry Oriented Schools.”



Diane Rover has been a professor in the Department of Electrical and Computer Engineering at Iowa State University since 2001, and was named University Professor in 2015. She currently serves as the director for two large-scale, NSF-funded programs: IINspire LSAMP is an alliance of sixteen institutions in Iowa, Illinois and Nebraska to broaden participation in STEM; and SP@ISU is a campus-wide program to support the broader impacts work of faculty. She is principal investigator of an NSF grant at ISU to investigate STEM faculty engagement with broader impacts. She is also co-PI for a nation-wide grant to establish the National Alliance for Broader Impacts. She has also been the principal investigator on NSF STEP and S-STEM grants at Iowa State that have focused on the recruitment, retention and success of engineering students. Dr. Rover has served on the IEEE Committee on Engineering Accreditation Activities and on the IEEE Education Society Board of Governors. She represented IEEE on the Engineering Accreditation Commission of ABET from 2009-2014 and began a term on the EAC Executive Committee in 2015. She began serving as an IEEE ABET program evaluator for computer engineering in 2002. From 1996-1998, she was director of technical activities for the IEEE Southeastern Michigan Section. Starting in 2009, she held officer positions in the ASEE ECE Division. She served as program chair for the ECE Division for the 2010 ASEE Annual Conference. From 2000-2008, she led the Academic Bookshelf column as a senior associate editor for the ASEE Journal of Engineering Education.

Reviewers

This year, FIE 2016 had over 800 papers and presentations submitted for consideration. The FIE 2016 Program Committee wishes to thank the following individuals for acting as abstract and paper reviewers. The program committee asked these individuals to help control the quality of the presentations at this year's conference by reviewing the submissions for FIE 2016. Their outstanding effort has helped maintain the high standard that has become the reputation of each FIE conference.

Name	Institution	Name	Institution
Cristinel Ababei	Marquette University	Toni Amorim	Universidade Estadual do Mato Grosso
Monica Abarca	Pontificia Universidad Catolica del Peru	Wilkerson Andrade	Federal University of Campina Grande
Haqiq Abdelkrim	Hassan university	Beatriz Añorbe-Díaz	Universidad de La Laguna
Otavio Acosta	Federal University of Rio Grande do Sul	Diego Aponte Roa	Caribbean University
Mangilal Agarwal	Indiana University-Purdue University Indianapolis	Eduardo Aranha	Federal University of Rio Grande do Norte (UFRN)
Dippy Aggarwal	University of Cincinnati	Catalina Aranzazu-Suescun	Florida Atlantic University
Benjamin Ahn	Iowa State University	Ana Liz Araujo	Federal University of Campina Grande
Ahmad Al-Jarrah	New Mexico State University	Eliane Araujo	Federal University of Campina Grande
Sadot Alexandres	Universidad Pontificia Comillas	Glen Archer	Michigan Technological University
Sanwar Ali	IUP	Julian Arenas Berrio	EAFIT University
Nuha Alkabour	University of Michigan-Flint	Danna Arias	Pontificia Universidad Catolica del Peru
Vicki Allan	Utah State University	Sanjeev Arora	Fort Valley State University
Graham Allen	Texas A&M University	Michael Auer	Carinthia Tech Institute
Colin Allison	University of St Andrews	Asad Azemi	Pennsylvania State University
Maria Altebarmakian	Brandeis University	Patricia Backer	San Jose State University
Ainhoa Álvarez	University of the Basque Country, UPV/EHU	M. Affan Badar	Indiana State University
Alexandre Alvaro	UFSCar - Sorocaba	Nilufar Baghaei	Unitec Institute of Technology
Luis Alves	Polytechnic Institute of Bragança	Thilak Balasubramanian	University of New Mexico
Idrees Alzahid	University of Technology	Silvia Baldiris	Universitat de Girona
Luis Amaral	University of Minho - ALGORITMI	Mahesh Banavar	Clarkson University
Catherine Amelink	Virginia Tech	Joan Banks-Hunt	Virginia Tech
Ricardo Amorim	State University of Bahia (UNEB)	Abubakar Bappah	Abubakar Tafawa Balewa University

Matthew Barner	Oregon State University	Maria Emília Bigotte de Almeida	Instituto Superior de Engenharia de Coimbra
John Barr	Ithaca College		
Elise Barrella	James Madison University	Devayan Bir	Iowa State University
Eduarne Barrenechea	Universidad Pública de Navarra	Ig Bittencourt	Universidade Federal de Alagoas
Marla Barrera	Universidad Nacional de Colombia	Roberto Bittencourt	State University of Feira de Santana
Luciana Barroso	Texas A&M University	Hannah Blau	University of Massachusetts Amherst
Sonia Bartolomei	University of Puerto Rico at Mayaguez	Brit-Maren Block	Leuphana University of Lüneburg
Robert Bass	Portland State University	Cheryl Bodnar	Rowan University
Rebecca Bates	Minnesota State University, Mankato	Christina Böhm	University of Vienna
Valério Batista	Federal University of ABC	Leonard J. Bohmann	Michigan Tech
Milton Joel Batres Márquez	Universidad Tecnológica de Chihuahua	Iva Bojic	Massachusetts Institute of Technology
Miguel Bazdresch	Rochester Institute of Technology	Andreas Bollin	University of Klagenfurt
Luiz Begosso	Fundacao Educacional do Municipio de Assis	Jennifer Bonniwell	Milwaukee School of Engineering
Luiz Begosso	Fundacao Educacional do Municipio de Assis - FEMA	Simone Borges	Universidade de São Paulo
Laleh Behjat	University of Calgary	Vanessa Borges	University of Sao Paulo
Lluís Belanche Muñoz	Universitat Politècnica de Catalunya	Barend Botha	University of Johannesburg
Mounir Ben Ghalia	The University of Texas Rio Grande Valley	Jesus Boticario	Universidad Nacional de Educacion a Distancia
Bedrich Benes	Purdue University		Munich University of Applied Sciences
José Benlloch-Dualde	Universitat Politècnica de València	Axel Böttcher	Interuniversity Doctoral Programme in Environmental Education,
Jens Bennedsen	University of Aarhus	Marija Božić	Autonomous University of Barcelona
Bridget Benson	Cal Poly, San Luis Obispo	Kalinka Branco	USP - University of São Paulo
Catherine Berdanier	The Pennsylvania State University	Anarosa Brandão	Universidade de São Paulo
Lamjed Bettaieb	ESPRIT	Leônidas Brandão	University of São Paulo
Angela Bielefeldt	University of Colorado Boulder	Catherine Brawner	Research Triangle Educational Consultants
		Rex Bringula	University of the East

Barry Brinkman	Gannon University	Manuel Castro	Spanish University
Claudio Brito	Science and Education Research Council		for Distance
Julien Broisin	University of Toulouse	Mario Chacon	Education - UNED
Shane Brown	Oregon State University	YunJeong Chang	Costa Rica Institute of Technology
Willie Brown	University of Maryland Eastern Shore	Norberto Charczuk	University of Virginia
Kevin Buffardi	California State University - Chico	Dmitriy Chebanov	National University of Lanus
Kevin Burger	Arizona State University	Helen Chen	LaGuardia Community College of CUNY Stan
Henriette Burns	Washington State University	Wei-Fan Chen	Penn State University
Candido Cabo	New York City College of Technology/City University of New York	Yongqiang Chen	Tsinghua University
Manuel Caeiro	University of Vigo	Ye Cheng	MathWorks
Carlos Caicedo Bastidas	Syracuse University	R Cheville	Bucknell University
María del Carmen Calatrava Moreno	Vienna University of Technology	Janneth Chicaiza	Universidad Técnica Particular de Loja
Hermes Calderón	Caribbean University		City University of Hong Kong
Agustin Caminero	The National University of Distance Education	Pit Ho Patrio Chiu	University of Illinois at Urbana- Champaign
Livia Campos	Federal University of Campina Grande	Dong San Choi	National University of Tainan
Edna Canedo	University of Brasília		Purdue University
Nathan Canney	Seattle University	Ken Christensen	University of South Florida
Mary Capraro	Texas A&M University	Melany Ciampi	Safety, Health and Environment Research Organization
Robert Capraro	Texas A&M University	Christopher Cischke	Michigan Technological University
Adam Carberry	Arizona State University	Ivan Claros	Universidad Autónoma de Madrid
Monica Cardella	Purdue University	Alison Clear	EIT
Guilherme Cardim	University of São Paulo State	Tony Clear	Auckland University of Technology
Cheryl Carrico	Virginia Tech		UOLS
Irene Andrea Carvalho	Universidade Federal do Amazonas - UFAM	August Climent	Nova Southeastern University
Jose Reginaldo Carvalho	Federal University of Amazonas	Maxine Cohen	University of Portland
Arthur Casals	USP - University of São Paulo	Olivia Coiado	Gannon University
Eileen Cashman	Humboldt State University	Nicholas Conklin	Speech Technology Group
Sofia Cassel	Uppsala University	Ricardo Cordoba	Polytechnic Institute of Coimbra
		Fernanda Brito Correia	

Robert Craig	PETROLEUM INSTITUTE	Adrienne Decker	Rochester Institute of Technology
DeLois Crawford	Rochester Institute of Technology	Opeyemi Dele-Ajayi	Northumbria University
Paul Crilly	United States Coast Guard Academy	Angel Delgado	University of Alicante
Jennifer Cross	Carnegie Mellon University	Matt DeMonbrun	University of Michigan
Kelly Cross	University of Illinois Urbana Champaign	Kayla DesPortes	Georgia Institute of Technology
Juan Cruz	Virginia Tech	Jan DeWaters	Clarkson University
Juan Cruz-Benito	University of Salamanca	Tuhin Dey	University of Houston
Antonette Cummings	Self-Employed	Gabriel Díaz	Universidad Nacional de Educación a Distancia - UNED
Patrick Currier	Embry-Riddle Aeronautical University	Samuel Dickerson	University of Pittsburgh
Nicholas Curtis	James Madison University	Heidi Diefes-Dux	Purdue University
Davidson Cury	UFES-Universidade Federal do Espirito Santo	Susan Donohue	University of Virginia
Stephanie Cutler	Penn State University	Mohsen Dorodchi	University of North Carolina, Charlotte
Maria da Silva	Universidade Federal de Alagoas	Kerrie Douglas	Purdue University
I Dabipi	University of Maryland Eastern Shore	Spyros Doukakis	The American College of Greece – Pierce
Theopisti Dafni	University of Zaragoza	Christos Douligeris	University of Piraeus
Danilo Dalmon	University of São Paulo	Adam Doupe	Arizona State University
Eduardo Damasceno	Universidade Tecnológica Federal do Paraná	Gavin Duffy	Dublin Institute of Technology
Andrew Danowitz	California Polytechnic State University San Luis Obispo	Alexey Dukhanov	ITMO University
Pratyusha Das	Tata Consultancy Services	Eric Durant	Milwaukee School of Engineering
Carol Davenport	Northumbria University	John Dyer	University of Oklahoma
Chad Davis	University of Oklahoma	Mauricio Dziedzic	Universidade Positivo
Kirsten Davis	Virginia Tech	Katherine Ehlert	Clemson University
Maria De Marsico	Sapienza University di Roma	Marius Ellingsen	South Dakota School of Mines and Technology
Charlotte de Vries	Pennsylvania State University Erie	Daniel Epstein	Federal University of Rio Grande do Sul - UFRGS
Eti de Vries	Hanze UAS	Kiran Kumar Eranki	IIT Bombay
Debzani Deb	Winston-salem State University	Andrew Erdman	Pennsylvania State University
		Andrey Esakia	Virginia Tech
		Elizabeth Eschenbach	Humboldt State University

M. Rosa Estela	Universitat Politècnica de Catalunya	Luciano Fleischfresser	Universidade Tecnológica Federal do Parana
Albert Esterline	North Carolina A&T State University	Shayne Flint	The Australian National University
Iria Estevez-Ayres	Universidad Carlos III de Madrid	David Fonseca	Enginyeria Arquitectura La Salle (Universitat Ramon Llull)
Odiel Estrada Molina	University of Informatics Science	Awdren Fontao	Federal University of Amazonas
Yadran Eterovic	Catholic University from Chile	Marissa Forbes	University of Colorado Boulder
Dan Ewert	North Dakota State University	Michael Fosmire	Purdue University
Courtney Faber	The College of New Jersey	Tad Foster	Indiana State University
Fabian Fagerholm	University of Helsinki	Robin Fowler	University of Michigan
Francisco Falcone	Universidad Publica de Navarra	Henrique Freitas	Pontifícia Universidade Católica de Minas Gerais
K.-Y. Daisy Fan	Cornell University	Sergio Freitas	University of Brasilia
Kai Fang	Tongji University	Stephen Frezza	Gannon University
Waleed Farag	Indiana University of Pennsylvania	Wilhelm Friess	University of Maine
Doron Faran	ORT Braude College	Cynthia Fry	Baylor University
Aracele Fassbinder	Federal Institute Of Education, Science And Technology of South Of Minas Gerais	Mohammad Fuad	Winston-Salem State University
Brian Faulkner	University of Illinois	Bruno Gadelha	Federal University of Amazonas
Leonardo Favario	Politecnico di Torino	Rose Gamble	University of Tulsa
Andreas Febrian	Utah State University	Tirupalavanam Ganesh	Arizona State University
Heiko Fechtner	University of Wuppertal	Eva Garcia	University of Alcalá
Eduardo Fernandes	UFMG	Rogério Garcia	São Paulo State University
Fernando Fernández-Martínez	Dpto. de Teoría de la Señal y Comunicaciones	Vinicius Garcia	Federal University of Pernambuco
Deller Ferreira	Federal University of Goias	Antonio Garcia-Cabot	University of Alcalá
Maria Joao Ferreira	Universidade Portucalense	Francisco García-Peñalvo	University of Salamanca
Begoña Ferrero	University of the Basque Country	Javier Garcia-Zubia	University of Deusto
Carla Fidalgo	ISEC/IPC	Anchal Garg	Amity University
Eduardo Figueiredo	Federal University of Minas Gerais (UFMG)	Cesar Garita	Costa Rica Institute of Technology
Maria Lydia Fioravanti	ICMC-USP	Nathan Garrett	Woodbury University
Wendy Fisher	Colorado School of Mines	Piedad Garrido	University of Zaragoza
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Session Chairs

The conference committee would like to thank the people that have agreed to act as session chairs at the 2016 Frontiers in Education Conference. Session chairs play an important role in ensuring the conference runs smoothly and that the technical presentations are a valuable experience for both speakers and attendees. Session chairs also have served a critical role in helping with the Ben Dasher Award process.

The primary responsibilities of session chairs are to:

- Read the session's papers in advance and recommend papers for the Ben Dasher Best Paper committee.
- Contact the authors in the session and become familiar with the authors who are presenting.
- Introduce the session and make any FIE announcements that are needed.
- Briefly introduce each speaker and paper.
- Manage audience questions, and ensure that presentations begin and end within their time slots.

The program committee would like to thank the following individuals and those session chairs not listed for their efforts to help make FIE 2016 both informative and successful:

Code	Title	Start time	Room	Chair
T1C	Design and Design Education	10:00 AM	130B	Manuel Castro (Spanish University for Distance Education - UNED, Spain)
T1D	Game-Based Learning: Development and Evaluation	10:00 AM	130C	Kevin Hadley (South Dakota School of Mines and Technology, United States)
T1E	PK-12: Teaching Math and Science and Engineering	10:00 AM	140A	Jennifer L. Cross (Carnegie Mellon University, United States)
T1F	Cybersecurity	10:00 AM	140B	Willie L. Brown (University of Maryland Eastern Shore, United States)
T1G	Entrepreneurship	10:00 AM	140C	Cheryl Bodnar (Rowan University, United States)
T1H	Online and Distance Learning	10:00 AM	160A	Catherine Berdanier (The Pennsylvania State University, USA)
T1I	Digital Design	10:00 AM	160B	Brian Skromme (Arizona State University, United States)
T1J	Problem-Based Learning	10:00 AM	160C	Cheryl Carrico (Virginia Tech, USA)
T2C	Academia-Industry Connections	1:30 PM	130B	Bart Johnson (Itasca Community College, United States)
T2D	Game-Based Learning: Skill Development	1:30 PM	130C	Joseph Ranalli (Penn State - Hazleton Campus, United States)
T2E	Algorithmic Assessment Methods	1:30 PM	140A	Salem Ali A. Elsaiah (Bucknell University, United States)
T2F	Computational Thinking	1:30 PM	140B	Leônidas O. Brandão (University of São Paulo, Brazil)
T2G	STEAM	1:30 PM	140C	James J. Sluss (The University of Oklahoma, United States)
T2H	Program Assessment and Program Development	1:30 PM	160A	Doron Faran (ORT Braude College, Israel)

T2I	Credentials and Accreditation	1:30 PM	160B	Paul B Crilly (United States Coast Guard Academy, United States)
T2J	Conceptions and Misconceptions	1:30 PM	160C	Tanya Kunberger (Florida Gulf Coast University, USA)
T3C	Educating Students on Professional Ethics	3:30 PM	130B	James Huff (Harding University, USA)
T3D	Game-Based Learning: Stakeholder Perspectives	3:30 PM	130C	Swaroop Joshi (The Ohio State University, United States)
T3E	Student Perceptions of Evaluation and Assessment	3:30 PM	140A	Rogério Garcia (São Paulo State University, Brazil)
T3F	Learning Software Development	3:30 PM	140B	Carlos Silla (Pontificia Universidade Católica do Paraná, Brazil)
T3G	Mathematics and Statistics	3:30 PM	140C	Jacqueline McNeil (University of Louisville, USA)
T3H	Computer-Based Learning and Courseware Technologies	3:30 PM	160A	Charles Wallace (Michigan Technological University, United States)
T3I	Student Beliefs and Motivation	3:30 PM	160B	Mounir Ben Ghalia (The University of Texas Rio Grande Valley, United States)
T3J	Design Education	3:30 PM	160C	Charlotte de Vries (Pennsylvania State University Erie, United States)
F1C	Faculty Development: Transferring Innovation	10:00 AM	130B	Molly Hathaway Goldstein (Purdue University, United States)
F1D	Self-Regulated Learning	10:00 AM	130C	Madalene Spezialetti (Trinity College, USA)
F1E	Robotics	10:00 AM	140A	Jose Reginaldo Hughes Carvalho (Federal University of Amazonas, Brazil)
F1F	Programming Courses and Concepts	10:00 AM	140B	Clifford De Raffaele (Middlesex University Malta, Malta)
F1G	Service and Learning	10:00 AM	140C	Carla Zoltowski (Purdue University, USA)
F1H	Pathways to Engineering Degrees	10:00 AM	160A	Beth Myers (University of Colorado Boulder, USA)
F1I	Graduate Student Education	10:00 AM	160B	Wendy Fisher (Colorado School of Mines, USA)
F1J	Integrating Business and Engineering	10:00 AM	160C	Donald V. MacKellar (Gannon University, United States)
F2C	Faculty Development: Careers	1:30 PM	130B	Divya Nalla (Nalla Malla Reddy Engineering College, India)
F2D	Diversity: Intersectionality	1:30 PM	130C	Javier A. Kypuros (The University of Texas Rio Grande Valley, USA)
F2E	PK-12: Teacher Development	1:30 PM	140A	Aaron Johnson (Tufts University, United States)
F2F	Advanced Computer Science Courses	1:30 PM	140B	Eric Durant (Milwaukee School of Engineering, USA)
F2G	Mobile Device Enabled Learning	1:30 PM	140C	Yi Wu (Penn State Erie, the Behrend College, United States)
F2H	Professional Skills Development	1:30 PM	160A	Benjamin Ahn (Iowa State University, United States)

F2I	Non-Traditional Student Pathways	1:30 PM	160B	Nathan Canney (Seattle University, United States)
F2J	Philosophy of Engineering and Engineering Education	1:30 PM	160C	Nicole Pitterson (Oregon State University, United States)
F3C	Faculty Development: Culture and Practices	4:00 PM	130B	Ella L Ingram (Rose-Hulman Institute of Technology, United States)
F3D	Diversity and Inclusivity Awareness	4:00 PM	130C	Kelly Cross (University of Illinois Urbana Champaign, United States)
F3E	PK-12: Teaching Computer-Related Topics	4:00 PM	140A	Courtney J. Faber (The College of New Jersey, USA)
F3F	Upper Division Computer Science	4:00 PM	140B	Tony Clear (Auckland University of Technology, New Zealand)
F3G	Remote Laboratories	4:00 PM	140C	Glen Archer (Michigan Technological University, United States)
F3H	Engineering Education Research	4:00 PM	160A	Cem Sahin (Drexel University, United States)
F3I	Engineering Discipline Specific	4:00 PM	160B	Yong-Kyu Jung (Gannon University, USA)
F3J	Problem Solving	4:00 PM	160C	Axel Böttcher (Munich University of Applied Sciences, Germany)
S1B	Peer Teaching and Learning	8:30 AM	170B	Kassim Tarhini (United States Coast Guard Academy, USA)
S1C	First and Second Year Programs	8:30 AM	130B	Mark A. Holliday (Western Carolina University, USA)
S1D	Inclusivity and Diversity Initiatives	8:30 AM	130C	Rebekah Michael (University of Cincinnati, USA)
S1E	Collaborative Teaching and Learning	8:30 AM	140A	Kurt Thoroughman (Washington University in St. Louis, USA)
S1F	Programming in the First and Second Years	8:30 AM	140B	Jeong Yang (Texas A&M University-San Antonio, United States)
S1G	Makers, Making, and Makerspaces	8:30 AM	140C	Tom J. Zajdel (University of California, Berkeley, United States)
S1H	Project-Based Learning	8:30 AM	160A	Qaiser Malik (National University of Sciences and Technology, Pakistan)
S1I	Undergraduate Research	8:30 AM	160B	Asad Azemi (Pennsylvania State University, United States)
S2C	Computer-Based Learning and Courseware Technologies II	10:30 AM	130B	Sven Esche (Stevens Institute of Technology, United States)
S2D	Diversity: Women and Girls	10:30 AM	130C	Alison Clear (EIT, New Zealand)
S2E	PK-12: Perceptions of STEM	10:30 AM	140A	Martin Kandlhofer (Graz University of Technology, Austria)
S2F	Computing Discipline Specific	10:30 AM	140B	Rebecca Reck (Kettering University, United States)
S2G	Student Approaches to Learning	10:30 AM	140C	Jill Nelson (George Mason University, United States)
S2H	Peer Tutoring and Mentoring	10:30 AM	160A	Matthew Barner (Oregon State University, USA)

S2I	Retention of First Year Students	10:30 AM	160B	Ciaran Moore (Victoria University of Wellington, New Zealand)
S3C	Redesigning Laboratory Experiences	1:30 PM	130B	Joshua Earnest (National Institute of Technical Teachers Training and Research, Bhopal, India)
S3D	Innovative Use of Tools	1:30 PM	130C	Georges El-Howayek (Valparaiso University, USA)
S3E	PK-12: Assessment and Evaluation Tools and Strategies	1:30 PM	140A	Nathan M. Hicks (Purdue University, USA)
S3F	Software Engineering Processes	1:30 PM	140B	Yolanda Martinez-Trevino (Tecnologico de Monterrey, Mexico)
S3G	Engineering in Global Context	1:30 PM	140C	Neha Choudhary (Purdue University, USA)
S3H	Literature Reviews and Analyses	1:30 PM	160A	Carlos Mugruza-Vassallo (Universidad de Lima, Peru)
S3I	Students as Learners	1:30 PM	160B	Ben Oni (Tuskegee University, USA)
S3J	Teaching and Learning Experiences in Engineering Education I	1:30 PM	160C	Jennifer Winikus (Michigan Technological University, United States)
S4A	Leadership	3:30 PM	170A	Andrew Danowitz (California Polytechnic State University San Luis Obispo, United States)
S4B	Group and Team Work	3:30 PM	170B	Marc Sosnick-Pérez (San Francisco State University, USA)
S4C	Identity, Learning and Persistence	3:30 PM	130B	Henriette Burns (Washington State University, United States)
S4D	Student-Centered Education	3:30 PM	130C	Renata A Revelo (University of Illinois at Chicago, United States)
S4E	PK-12: Pathways to Careers	3:30 PM	140A	Henry Griffith (Michigan State University, United States)
S4F	Evaluating Computer Programming	3:30 PM	140B	Nannan He (Minnesota State University at Mankato, United States)
S4G	Cultural Competence	3:30 PM	140C	Katherine Ehler (Clemson University, USA)
S4H	Learning and Teaching Analytics	3:30 PM	160A	Mohsen Dorodchi (University of North Carolina, Charlotte, United States)
S4I	Curriculum Design in Computer Science/Engineering	3:30 PM	160B	Sami Khorbotly (Valparaiso University, United States)
S4J	Teaching and Learning Experiences in Engineering Education II	3:30 PM	160C	Joan Banks-Hunt (Virginia Tech, USA)

Session Grid – Wednesday, October 12th

Time	Sheraton Harlequin A	Sheraton Harlequin B	Sheraton Otter	Sheraton Harlequin C	Sheraton Safe Harbor
1:00 PM -4:00 PM	Evidence-Based teaching	Designing an Engineering Recovery Course	<p>1A: A Developmental and Adaptive Problem Based Learning (PBL) Model Across the Curriculum: From Theory to Practice in Integrating and Assessing PBL Experiences across the James Madison University Engineering Curriculum</p> <p>DOI: 10.1109/FIE.2016.7757338</p>	<p>1B: NSF Programs that support Engineering Education Research</p> <p>DOI: 10.1109/FIE.2016.7757339</p>	<p>1C: Peer Grading Development Cycle</p> <p>DOI: 10.1109/FIE.2016.7757340</p>
5:00 PM -8:00 PM			<p>2B: Integrated Faculty Course Assessment Report (FCAR) Model with Traditional Rubric-Based (GR) Model to Enhance Automation of Student Outcomes Evaluation</p> <p>DOI: 10.1109/FIE.2016.7757342</p>	<p>2A: Tips for Turning Good Ideas into Competitive National Science Foundation Engineering Education CAREER Proposals: A Grant Writing Workshop</p> <p>DOI: 10.1109/FIE.2016.7757341</p>	<p>2C: Academic coaching tools for increased retention: empowering engineering students in their education</p> <p>DOI: 10.1109/FIE.2016.7757343</p>

Session Grid – Thursday, October 13th

Time	170A	170B	130B	130C	140A	140B	140C	160A	160B	160C
10:00 AM - 12:00 PM	T1A: Panel: Business & Engineering Education: A Multiple Stakeholder Perspective <small>DOI: 10.1109/FIE.2016.7757344</small>	T1B: Panel: Changing Your Department: Examples from Revolutionizing Engineering Departments <small>DOI: 10.1109/FIE.2016.7757345</small>	T1C: Design and Design Education	T1D: Game-Based Learning: Development and Evaluation	T1E: PK-12: Teaching Math and Science and Engineering	T1F: Cybersecurity	T1G: Entrepreneurship	T1H: Online and Distance Learning	T1I: Digital Design	T1J: Problem-Based Learning
1:30 PM - 3:00 PM	T2A: Special Session: Exploring Learning Opportunities in Engineering Education Using 2D, 3D, and Immersive Video-Augmented Online Technologies <small>DOI: 10.1109/FIE.2016.7757390</small>	T2B: Special Session: I-Corps™ for Learning: Sustaining and Scaling STEM Education Innovations for Impact <small>DOI: 10.1109/FIE.2016.7757391</small>	T2C: Academia-Industry Connections	T2D: Game-Based Learning: Skill Development	T2E: Algorithmic Assessment Methods	T2F: Computational Thinking	T2G: STEAM	T2H: Program Assessment and Program Development	T2I: Credentials and Accreditation	T2J: Conceptions and Misconceptions
3:30 PM - 5:00 PM	T3A: Special Session: Innovation T-Ball: Everybody Wins!! <small>DOI: 10.1109/FIE.2016.7757432</small>	T3B: Panel: Launching Curricular Guidelines for Computer Engineering: CE2016 <small>DOI: 10.1109/FIE.2016.7757433</small>	T3C: Educating Students on Professional Ethics	T3D: Game-Based Learning: Stakeholder Perspectives	T3E: Student Perceptions of Evaluation and Assessment	T3F: Learning Software Development	T3G: Mathematics and Statistics	T3H: Computer-Based Learning and Courseware Technologies	T3I: Student Beliefs and Motivation	T3J: Design Education

Session Grid – Friday, October 14th

Time	170A	170B	130B	130C	140A	140B	140C	160A	160B	160C
10:00 AM - 12:00 PM	F1A: Panel: Developments in Global Software Engineering Education <small>DOI: 10.1109/FIE.2016.7757471</small>	F1B: Panel: Integrating Systems Engineering and Systems Thinking into Undergraduate Engineering Education <small>DOI: 10.1109/FIE.2016.7757472</small>	F1C: Faculty Development: Transferring Innovation	F1D: Self-Regulated Learning	F1E: Robotics	F1F: Programming Courses and Concepts	F1G: Service and Learning	F1H: Pathways to Engineering Degrees	F1I: Graduate Student Education	F1J: Integrating Business and Engineering
1:30 PM - 3:00 PM	F2A: Special Session: Considering students' intrinsic motivations and positive emotions in course design: Are they ends, means, or threats? <small>DOI: 10.1109/FIE.2016.7757516</small>	F2B: Special Session: Open Sourcing Education for Data Engineering and Data Science <small>DOI: 10.1109/FIE.2016.7757517</small>	F2C: Faculty Development: Careers	F2D: Diversity: Intersectionality	F2E: PK-12: Teacher Development	F2F: Advanced Computer Science Courses	F2G: Mobile Devise Enabled Learning	F2H: Professional Skills Development	F2I: Non-Traditional Student Pathways	F2J: Philosophy of Engineering and Engineering Education
4:00 PM - 5:30 PM	F3A: Special Session: Developing ABET Criteria for Undergraduate Cybersecurity Programs <small>DOI: 10.1109/FIE.2016.7757557</small>	F3B: Special Session: Preparing Engineers for Careers in Social Innovation and Sustainable Development <small>DOI: 10.1109/FIE.2016.7757558</small>	F3C: Faculty Development: Culture and Practices	F3D: Diversity and Inclusivity Awareness	F3E: PK-12: Teaching Computer-Related Topics	F3F: Upper Division Computer Science	F3G: Remote Laboratories	F3H: Engineering Education Research	F3I: Engineering Discipline Specific	F3J: Problem Solving
5:00 PM - 6:30 PM	F4A: ABET CAC: Cybersecurity Program Criterion Development									

Session Grid – Saturday, October 15th

Time	170A	170B	130B	130C	140A	140B	140C	160A	160B	160C
8:30 AM - 10:30 AM	S1A: Special Session: Culturally Responsive Practices in K-16 Engineering Education <small>DOI: 10.1109/FIE.2016.7757596</small>	S1B: Peer Teaching and Learning	S1C: First and Second Year Programs	S1D: Inclusivity and Diversity Initiatives	S1E: Collaborative Teaching and Learning	S1F: Programming in the First and Second Years	S1G: Makers, Making, and Makerspaces	S1H: Project-Based Learning	S1I: Undergraduate Research	S1J: Special Session: ABET CAC Criterion Revisions: Discussion and Comment
10:30 AM - 12:00 PM	S2A: Special Session: Making the Multiple Institution Database for Investigating Engineering Longitudinal Development (MIDFIELD) More Accessible to Researchers <small>DOI: 10.1109/FIE.2016.7757635</small>	S2B: Special Session: Designing The Engineer's Way <small>DOI: 10.1109/FIE.2016.7757636</small>	S2C: Computer-Based Learning and Courseware Technologies II	S2D: Diversity: Women and Girls	S2E: PK-12: Perceptions of STEM	S2F: Computing Discipline Specific	S2G: Student Approaches to Learning	S2H: Peer Tutoring and Mentoring	S2I: Retention of First Year Students	
1:30 PM - 3:00 PM	S3A: Panel: Teaching Teachers to Teach Diverse Students in Computer Science: Content and Resources for In-person and Online Delivery <small>DOI: 10.1109/FIE.2016.7757665</small>	S3B: Special Session: The Behavioral Economics of Instructional Decision Making <small>DOI: 10.1109/FIE.2016.7757666</small>	S3C: Redesigning Laboratory Experiences	S3D: Innovative Use of Tools	S3E: PK-12: Assessment and Evaluation Tools and Strategies	S3F: Software Engineering Processes	S3G: Engineering in Global Context	S3H: Literature Reviews and Analyses	S3I: Students as Learners	S3J: Teaching and Learning Experiences in Engineering Education I
3:30 PM - 5:00 PM	S4A: Leadership	S4B: Group and Team Work	S4C: Identity, Learning and Persistence	S4D: Student-Centered Education	S4E: PK-12: Pathways to Careers	S4F: Evaluating Computer Programming	S4G: Cultural Competence	S4H: Learning and Teaching Analytics	S4I: Curriculum Design in Computer Science/ Engineering	S4J: Teaching and Learning Experiences in Engineering Education II

Technical Sessions Table of Contents

Wednesday, October 12

1A: A Developmental and Adaptive Problem Based Learning (PBL) Model Across the Curriculum: From Theory to Practice in Integrating and Assessing PBL Experiences across the James Madison University Engineering Curriculum

1:00 PM – 4:00 PM

Room: 170A

A DEVELOPMENTAL AND ADAPTIVE PROBLEM BASED LEARNING (PBL) MODEL ACROSS THE CURRICULUM: FROM THEORY TO PRACTICE IN INTEGRATING AND ASSESSING PBL EXPERIENCES ACROSS THE JAMES MADISON UNIVERSITY ENGINEERING CURRICULUM

Olga Pierrakos (James Madison University, USA)

Robin Anderson (James Madison University, USA)

Elise Barrella (James Madison University, USA)

1B: NSF Programs that support Engineering Education Research

1:00 PM – 4:00 PM

Room: 170B

NATIONAL SCIENCE FOUNDATION PROGRAMS THAT SUPPORT ENGINEERING EDUCATION RESEARCH

Ece Yaprak (National Science Foundation, USA)

Karen Crosby (National Science Foundation, USA)

Olga Pierrakos (National Science Foundation, USA)

Abby Ilumoka (National Science Foundation, USA)

Yvette Pearson Weatherton (National Science Foundation, USA)

Elliot Douglas (National Science Foundation, USA)

James Moore (National Science Foundation, USA)

1C: Peer Grading Development Cycle

1:00 PM – 4:00 PM

Room: 130B

PEER GRADING DEVELOPMENT CYCLE

Shawn Lupoli (UMBC, USA)

2A: Tips for Turning Good Ideas into Competitive National Science Foundation Engineering Education CAREER Proposals: A Grant Writing Workshop

5:00 PM – 8:00 PM

Room: 170A

TIPS FOR TURNING GOOD IDEAS INTO COMPETITIVE NATIONAL SCIENCE FOUNDATION ENGINEERING EDUCATION CAREER PROPOSALS: A GRANT WRITING WORKSHOP

Olga Pierrakos (National Science Foundation, USA)

2B: Integrated Faculty Course Assessment Report (FCAR) Model with Traditional Rubric-Based (GR) Model to Enhance Automation of Student Outcomes Evaluation

5:00 PM – 8:00 PM

Room: 170B

INTEGRATED FACULTY COURSE ASSESSMENT REPORT (FCAR) MODEL WITH TRADITIONAL RUBRIC-BASED (GR) MODEL TO ENHANCE AUTOMATION OF STUDENT OUTCOMES EVALUATION

Fong Mak (Gannon University, USA)

Ramakrishnan Sundaram (Gannon University, USA)

2C: Academic coaching tools for increased retention: empowering engineering students in their education

5:00 PM – 8:00 PM

Room: 130B

ACADEMIC COACHING TOOLS FOR INCREASED RETENTION: EMPOWERING ENGINEERING STUDENTS IN THEIR EDUCATION

Jennifer Groh (Purdue University, USA)

Thursday, October 13

TIA: Panel: Business & Engineering Education: A Multiple Stakeholder Perspective

10:00 AM - 12:00 PM

Room: 170A

BUSINESS & ENGINEERING EDUCATION: A MULTIPLE STAKEHOLDER PERSPECTIVE

Diane H. Parente (Penn State Erie, The Behrend College, USA)

Dipo Onipede (Penn State Erie, The Behrend College, USA)

Greg P. Dillon (Penn State Erie, The Behrend College, USA)

TIB: Panel: Changing Your Department: Examples from Revolutionizing Engineering Departments

10:00 AM - 12:00 PM

Room: 170B

PANEL: CHANGING YOUR DEPARTMENT: EXAMPLES FROM REVOLUTIONIZING ENGINEERING DEPARTMENTS

Ella L. Ingram (Rose-Hulman Institute of Technology, USA)

TIC: Design and Design Education

Chair: Manuel Castro (Spanish University for Distance Education – UNED, Spain)

10:00 AM - 12:00 PM

Room: 130B

DEVELOPING A MEASURE OF QUALITY FOR ENGINEERING DESIGN ARTIFACTS

Molly Hathaway Goldstein (Purdue University, USA)

Camilo Vieira Mejia (Purdue University, USA)

Robin Adams (Purdue University, USA)

Şenay Purzer (Purdue University, USA)

Mitch Zielinski (Purdue University, USA)

AN ADAPTIVE E-LEARNING PLATFORM FOR THE QUALIFICATION FOR WORKING ON ELECTRIC VEHICLES

Heiko Fechtner (University of Wuppertal, Germany)

Benedikt Schmuelling (University of Wuppertal, Germany)

Karl-Heinz Saes (TÜV NORD Bildung GmbH & Co. KG, Germany)

DESIGN OF SOCIAL SYSTEMS: THE CASE OF A UNIQUE COURSE

Doron Faran (ORT Braude academic college, Israel)

KNOWLEDGE TRANSFER: DOES MORE EXPERIENCE YIELD IMPROVED DESIGN QUALITY?

DeLean Tolbert (Purdue University, USA)

Reis Lehman (Purdue University, USA)

Guannan Liu (Purdue University, USA)

Benjamin Sadler (Purdue University, USA)

Monica Cardella (Purdue University, USA)

A DESIGN STUDIO COURSE IN APPLICATION DEVELOPMENT: LESSONS LEARNED

Steven R. Haynes (The Pennsylvania State University, USA)

David R. Mudgett (The Pennsylvania State University, USA)

FIVE YEARS OF EXTRA CREDIT IN A STUDIO-BASED COURSE: AN EFFORT TO INCENTIVIZE SOCIALLY USEFUL BEHAVIOR

Edward F. Gehringer (NC State University, USA)

Zhewei Hu (NC State University, USA)

Yang Song (NC State University, USA)

TID: Game-Based Learning: Development and Evaluation

Chair: Kevin Hadley (South Dakota School of Mines and Technology, USA)

10:00 AM - 12:00 PM

Room: 130C

USING GAMIFICATION FOR ENGAGEMENT AND LEARNING IN ELECTRICAL AND COMPUTER ENGINEERING CLASSROOMS

Emily Marasco (University of Calgary, Canada)

Laleh Behjat (University of Calgary, Canada)

Marjan Eggermont (University of Calgary, Canada)

William Rosehart (University of Calgary, Canada)

Mohammad Moshirpour (University of Calgary, Canada)

Ron Hugo (University of Calgary, Canada)

MOBILE SERIOUS GAME PROPOSAL FOR ENVIRONMENTAL AWARENESS OF CHILDREN

Eunice P. S. Nunes (Universidade Federal de Mato Grosso (UFMT), Brazil)

Alessandro R. Luz (Universidade Federal de Mato Grosso (UFMT), Brazil)

Eduardo M. Lemos (Universidade Federal de Mato Grosso (UFMT), Brazil)

Cristiano Maciel (Universidade Federal de Mato Grosso (UFMT), Brazil)

Alexandre Anjos (Universidade Federal de Mato Grosso (UFMT), Brazil)

Luciana Borges (Universidade Federal de Mato Grosso (UFMT), Brazil)

Clodoaldo Nunes (Instituto Federal de Educação, Ciencia e Tecnologia de Mato Grosso (IFMT), Brazil)

METHODOLOGY AND A TECHNOLOGICAL FRAMEWORK TO MAXIMIZE LEARNING IN A DEVELOPMENT OF SERIOUS GAMES DISTANCE COURSE AND THE EVALUATION OF LEARNING

Heraclito A. Pereira, Jr. (Federal University of Espirito Santo, Brazil)

Alberto F. De Souza (Federal University of Espirito Santo, Brazil)

Crediné S. De Menezes (Federal University of Espirito Santo, Brazil)

EDUCATIONAL GAMES DEVELOPMENT: ISSUES AND CHALLENGES

Daniela C. C. Peixoto (Centro Federal de Educação Tecnologia, Brazil)

Rodolfo F. Resende (Universidade Federal de Minas Gerais, Brazil)

Clarindo Isaias P. S. Pádua (Universidade Federal de Minas Gerais, Brazil)

CROWDLEARNING: A FRAMEWORK FOR COLLABORATIVE PERSONALIZED LEARNING

Thilak Balasubramanian (University of New Mexico, USA)

Trilce Estrada (University of New Mexico, USA)

DESIGN AND EVALUATION OF A COMPUTER BASED GAME FOR EDUCATION

María Julian-Mateos (Universidad Carlos III de Madrid, Spain)

Pedro J. Muñoz -Merino (Universidad Carlos III de Madrid, Spain)

Carlos Delgado Kloos (Universidad Carlos III de Madrid, Spain)

Davinia Hernández-Leo (Universitat Pompeu Fabra, Spain)

Diego Redondo-Martínez (Centro para Adultos CEPA Distrito, Spain)

TIE: PK-12: Teaching Math and Science and Engineering

Chair: Jennifer L. Cross (Carnegie Mellon University, USA)

10:00 AM - 12:00 PM

Room: 140A

***A FRAMEWORK TO TEACH MIDDLE SCHOOL STUDENTS MATHEMATICS
AND SCIENCE USING ROBOTS***

Abdelmalek Halawani (David Yellin Academic College of Education, Israel)

Eli Kolberg (Bar-Ilan University, Israel)

***TOWARDS THE STEM KNOWLEDGE HOMOGENIZATION OF PRE-UNIVERSITY STUDENTS IN 21ST
CENTURY: MOOC: THE LANGUAGE FOR ENGINEERING***

M.R. Estela-Carbonell (Universitat Politècnica de Catalunya, BarcelonaTech, Spain)

A. Codina (Universitat Politècnica de Catalunya, BarcelonaTech, Spain)

J. Poblet-Puig (Universitat Politècnica de Catalunya, BarcelonaTech, Spain)

P. Pardo (Universitat Politècnica de Catalunya, BarcelonaTech, Spain)

M.A. Puigvi (Universitat Politècnica de Catalunya, BarcelonaTech, Spain)

E. Pujadas (Universitat Politècnica de Catalunya, BarcelonaTech, Spain)

S. Valls (Universitat Politècnica de Catalunya, BarcelonaTech, Spain)

M.D. Alvarez (Universitat Politècnica de Catalunya, BarcelonaTech, Spain)

E. Gaus (Universitat Politècnica de Catalunya, BarcelonaTech, Spain)

C. Hervada-Sala (Universitat Politècnica de Catalunya, BarcelonaTech, Spain)

J. Macanás (Universitat Politècnica de Catalunya, BarcelonaTech, Spain)

A. Masip-Alvarez (Universitat Politècnica de Catalunya, BarcelonaTech, Spain)

M. Morillo (Universitat Politècnica de Catalunya, BarcelonaTech, Spain)

F. Nejari (Universitat Politècnica de Catalunya, BarcelonaTech, Spain)

***EMPLOYING PROJECT-BASED LEARNING TO ADDRESS THE NEXT GENERATION MATHEMATICS
STANDARDS IN HIGH SCHOOLS***

Afrin Naz (West Virginia University Institute of Technology, USA)

Mingyu Lu (West Virginia University Institute of Technology, USA)

Kenan Hatipoglu (West Virginia University Institute of Technology, USA)

Karen Rambo-Hernandez (West Virginia University, USA)

LABDUINO: AN OPEN SOURCE TOOL FOR SCIENCE EDUCATION

Diogo Guimarães Carvalho (C.E.S.A.R.edu, Brazil)

Walquiria Castelo Branco Lins (C.E.S.A.R.edu, Brazil)

***USING SPACED REPETITION AND GAMIFICATION TO ENHANCE K-12
STUDENT SCIENCE LITERACY WITH ON-DEMAND MOBILE SHORT READS***

Martin K.-C. Yeh (Penn State University, USA)

Abtin Toshtzar (Penn State University, USA)

Laura Guertin (Penn State University, USA)

Yu Yan (Penn State University, USA)

***BROADENING AND SUSTAINING AN AIR QUALITY K-12 CURRICULUM
THROUGH A DIGITAL LIBRARY AND UNDERGRADUATE
SERVICE LEARNING COURSE***

Daniel Knight (University of Colorado Boulder, USA)

Ashley Collier (University of Colorado, Boulder, USA)

Michael Hannigan (University of Colorado Boulder, USA)

Katya Hafich (University of Colorado, Boulder, USA)

TIF: Cybersecurity

Chair: Willie L. Brown, Jr (University of Maryland Eastern Shore, USA)

10:00 AM - 12:00 PM

Room: 140B

HOW STUDENTS REASON ABOUT CYBERSECURITY CONCEPTS

Travis Scheponik (University of Maryland Baltimore County, USA)

Alan T. Sherman (University of Maryland, Baltimore County, USA)

David DeLatte (University of Maryland, Baltimore County, USA)

Dhananjay Phatak (University of Maryland, Baltimore County, USA)

Linda Oliva (University of Maryland, Baltimore County, USA)

Julia Thompson (University of Illinois at Urbana-Champaign, USA)

Geoffrey L. Herman (University of Illinois at Urbana-Champaign, USA)

DEVELOPING AND EVALUATING A HANDS-ON LAB FOR TEACHING LOCAL AREA NETWORK VULNERABILITIES

Jinsheng Xu (North Carolina A&T State University, USA)

Xiaohong Yuan (North Carolina A&T State University, USA)

Anna Yu (North Carolina A&T State University, USA)

Jung Hee Kim (North Carolina A&T State University, USA)

Taehee Kim (North Carolina A&T State University, USA)

Jinghua Zhang (Winston-Salem State University, USA)

TEACHING MOBILE COMPUTING AND MOBILE SECURITY

Xiaohong Yuan (North Carolina Agricultural & Technical State University, USA)

Kenneth Williams (North Carolina Agricultural & Technical State University, USA)

Kelvin Bryant (North Carolina Agricultural & Technical State University, USA)

Jinsheng Xu (North Carolina Agricultural & Technical State University, USA)

Albert Esterline (North Carolina Agricultural & Technical State University, USA)

Scott McCrickard (Virginia Tech, USA)

Anyi Liu (Purdue University Fort Wayne, USA)

Charles Hardnett (Gwinnett Technical College, USA)

Selvarajah Mohanarajah (Claflin University, USA)

Litany H. Lineberry (Voorhees College, USA)

Rachel Rutledge (Charleston County School District, USA)

WIRELESS COMMUNICATIONS ENGINEERING EDUCATION VIA AUGMENTED REALITY

Cem Sahin (Drexel University, USA)

Danh Nguyen (Drexel University, USA)

Simon Begashaw (Drexel University, USA)

Brandon Katz (Drexel University, USA)

James Chacko (Drexel University, USA)

Logan Henderson (Drexel University, USA)

Jennifer Stanford (Drexel University, USA)

Kapil R. Dandekar (Drexel University, USA)

A MODULAR APPROACH TO TEACHING CRITICAL INFRASTRUCTURE PROTECTION CONCEPTS TO ENGINEERING, TECHNOLOGY AND COMPUTING STUDENTS

Sumita Mishra (Rochester Institute of Technology, USA)

Trudy Howles (Rochester Institute of Technology, USA)

Rajendra K. Raj (Rochester Institute of Technology, USA)

Carol J. Romanowski (Rochester Institute of Technology, USA)

Jennifer Schneider (Rochester Institute of Technology, USA)

Alicia McNett (Pennsylvania College of Technology, USA)

Daryl J. Dates (Corning Community College, USA)

TIG: Entrepreneurship

Chair: Cheryl Bodnar (Rowan University, USA)

10:00 AM - 12:00 PM

Room: 140C

FOSTERING AN ENTREPRENEURIAL MINDSET IN "DIGITAL SYSTEMS" CLASS THROUGH A PRODUCER-CUSTOMER MODEL

Nozar Tabrizi (Kettering University, USA)

EXPLORING DIFFERENCES IN PERCEIVED INNOVATIVE THINKING SKILLS BETWEEN FIRST YEAR AND UPPERCLASSMEN ENGINEERS

Kirsten A Davis (Virginia Tech, USA)

Catherine T. Amelink (Virginia Tech, USA)

ENTREPRENEURIAL CURRICULUM IN AN ENGINEERING TECHNICAL COMMUNICATION COURSE: LOOKING FOR IMPACT ON CREATIVITY AND MINDSET

Benjamin J. Call (Utah State University, USA)

Wade H. Goodridge (Utah State University, USA)

Melissa Scheaffer (Utah State University, USA)

RE-COMMERCE: A NEW PARADIGM FOR INNOVATION AND SUSTAINABILITY IN CSET EDUCATION

L. Eric James (University of Southern Maine, USA)

ENTREPRENEURSHIP AND TECHNOLOGY: DEVELOPING 21ST CENTURY SKILLS

Jose Luis Martin Nuñez (Universidad Politécnica de Madrid, Spain)

Gema Maria Fernández Merchán (HMS Gestión de Proyectos Chile, Chile)

Ana Vázquez Martínez de Miguel (Universidad Politécnica de Madrid, Spain)

Cristian Bravo Román (Fundación Telefónica Chile, Chile)

UNPACKING THE IMPACT OF ENGINEERING ENTREPRENEURSHIP EDUCATION THAT LEVERAGES THE LEAN LAUNCHPAD CURRICULUM

Aileen Huang-Saad (University of Michigan, USA)

Christina Morton (University of Michigan, USA)

Julie Libarkin (Michigan State University, USA)

TIH: Online and Distance Learning

Chair: Catherine Berdanier (The Pennsylvania State University, USA)

10:00 AM - 12:00 PM

Room: 160A

APPLICABILITY OF ONLINE MECHANICS OF MATERIALS COURSE FOR ENGINEERING UNDERGRADUATE STUDENTS

Devayan Bir (Iowa State University, USA)

Benjamin Ahn (Iowa State University, USA)

LET US LEARN TOGETHER! DO COMPLEMENTARY ABILITIES FOSTER PAIR COLLABORATION IN WEB-BASED LEARNING?

Patrícia Alves Rodrigues (University of São Paulo, Brazil)

Leônidas de O. Brandão (University of São Paulo, Brazil)

Anarosa Alves Franco Brandão (Universidade de São Paulo, Brazil)

***SURVEYING THE MOTIVATIONS OF GROUPS OF LEARNERS
IN HIGHLY-TECHNICAL STEM MOOCs***

Brittany Mihalec-Adkins (Purdue University, USA)
Nathan Hicks (Purdue University, USA)
Kerrie A. Douglas (Purdue University, USA)
Heidi Diefes-Dux (Purdue University, USA)
Peter Bermel (Purdue University, USA)
Krishna Madhavan (Purdue University, USA)

OPTIMIZING THE MANAGEMENT OF DISTANCE COURSES THOUGH MULTI-AGENT SYSTEM

Neila Batista Xavier (Ciência e Tecnologia do Amazonas, Brazil)
José Francisco de Magalhães Netto (Universidade Federal do Amazonas, Brazil)

***CAN ONLINE DELIVERY RESULT IN COMPARABLE ACHIEVEMENT OF COURSE OUTCOMES AND
STUDENT SUCCESS IN DIFFERENT COMPUTER SCIENCE COURSES?***

Waleed Farag (Indiana University of Pennsylvania, USA)
Sanwar Ali (Indiana University of Pennsylvania, USA)

***MOOE: A NEW ONLINE EDUCATION MODE: VIRTUAL SIMULATION EXPERIMENT MOOE
PLATFORM FOR FPGA***

Ying Li (Beihang University, P.R. China)
Jianwei Niu (Beihang University, P.R. China)
Zhang Jiong (Beihang University, P.R. China)
Xin Ren (Beihang University, P.R. China)

III: Digital Design

Chair: Brian Skromme (Arizona State University, USA)

10:00 AM - 12:00 PM

Room: 160B

***LEVERAGING THE FINAL PROJECT TO IMPROVE STUDENT MOTIVATION
IN INTRODUCTORY DIGITAL DESIGN COURSES***

Andrew Danowitz (California Polytechnic State University, USA)

***CIRCUIT DIAGRAMS VS. PHYSICAL CIRCUITS: THE EFFECT OF REPRESENTATIONAL
FORMS DURING ASSESSMENT***

Kayla DesPortes (Georgia Institute of Technology, USA)
Aditya Anupam (Georgia Institute of Technology, USA)
Neeti Pathak (Georgia Institute of Technology, USA)
Betsy DiSalvo (Georgia Institute of Technology, USA)

***EXPLORING UNDERGRADUATE ENGINEERING STUDENTS' CONCEPTUAL LEARNING
OF COMPLEX CIRCUIT CONCEPTS IN AN INTRODUCTORY COURSE***

Nicole P. Pitterson (Oregon State University, USA)
Ruth Streveler (Purdue University, USA)
Cordelia Brown (Auburn University, USA)

***USING THE BASYS-3 TRAINER TO SUPPORT VHDL IN DIGITAL LOGIC
FUNDAMENTALS COURSE***

Jennifer L. Bonniwell (Marquette University, USA)
Susan C. Schneider (Marquette University, USA)

STUDYING HOW DIGITAL LOGIC INSTRUCTORS SOLVE CANONICAL PROBLEMS

Geoffrey L. Herman (University of Illinois at Urbana-Champaign, USA)

T1J: Problem-Based Learning

Chair: Cheryl Carrico (Virginia Tech, USA)

10:00 AM - 12:00 PM

Room: 160C

A FRAMEWORK FOR APPLYING PROBLEM-BASED LEARNING TO COMPUTING EDUCATION

Ariane Nunes Rodrigues (Universidade Federal de Pernambuco, Brazil)

Simone C. dos Santos (Universidade Federal de Pernambuco, Brazil)

PBL-TUTOR CANVAS: A TOOL BASED ON BACKWARD DESIGN TO PLAN PBL IN COMPUTING EDUCATION

Tiago Carvalho Vidal (Informatics Center of Federal University of Pernambuco, Brazil)

Simone C. Dos Santos (Informatics Center of Federal University of Pernambuco, Brazil)

Rosângela Saraiva Carvalho (Informatics Center of Federal University of Pernambuco, Brazil)

DEVELOPMENT OF PROFESSIONAL COMPETENCY THROUGH PROFESSIONAL IDENTITY FORMATION IN A PBL CURRICULUM

Bart Johnson (Itasca Community College, USA)

Ron Ulseth (Iron Range Engineering, USA)

PBLMAESTRO: A VIRTUAL LEARNING ENVIRONMENT FOR THE IMPLEMENTATION OF PROBLEM-BASED LEARNING APPROACH IN COMPUTER EDUCATION

Felipe Soares de Oliveira (Center of Informatics, Brazil)

Simone Santos (Center of Informatics, Brazil)

EFFECTS OF BILATERAL PROBLEM-BASED LEARNING PROGRAM FOR ENGINEERING STUDENTS: CASE OF A JOINT COURSE WITH JAPAN AND THAILAND

Eri Ota (Tokyo Institute of Technology, Japan)

Proadpran Punyabukkana (Chulalongkorn University, Thailand)

T2A: Special Session: Exploring Learning Opportunities in Engineering Education Using 2D, 3D and Immersive Video-Augmented Online Technologies

1:30 PM - 3:00 PM

Room: 170A

SPECIAL SESSION: EXPLORING LEARNING OPPORTUNITIES IN ENGINEERING EDUCATION USING 2D, 3D AND IMMERSIVE VIDEO-AUGMENTED ONLINE TECHNOLOGIES

Sasha Nikolic (University of Wollongong, Australia)

Mark J. W. Lee (Charles Sturt University, Australia)

T2B: Special Session: I-Corps™ for Learning: Sustaining and Scaling STEM Education Innovations for Impact

1:30 PM - 3:00 PM

Room: 170B

I-CORPS™ FOR LEARNING: SUSTAINING AND SCALING STEM EDUCATION INNOVATIONS FOR IMPACT

Rocio C. Chavela Guerra (American Society for Engineering Education, USA)

Karl A. Smith (University of Minnesota, USA)

T2C: Academia-Industry Connections

Chair: Bart Johnson (Itasca Community College, USA)

10:00 AM - 12:00 PM

Room: 140B

STEM EDUCATION PROGRAM EVALUATION SURVEY: A REPORT OF EXPERIENCE

Jose Reginaldo Hughes Carvalho (Federal University of Amazonas, Brazil)

Elaine H. T. de Oliveira (Federal University of Amazonas, Brazil)

Irene Andrea V.A. Carvalho (Federal University of Amazonas, Brazil)

BRINGING CORPORATE SOCIAL RESPONSIBILITY INTO THE PETROLEUM ENGINEERING CLASSROOM

Carrie J. McClelland (Colorado School of Mines, USA)

Jessica M. Smith (Colorado School of Mines, USA)

Nicole M. Smith (Colorado School of Mines, USA)

ACADEMY-INDUSTRY COLLABORATION AND THE EFFECTS OF THE INVOLVEMENT OF UNDERGRADUATE STUDENTS IN REAL WORLD ACTIVITIES

Elaine Venson (University of Brasília, Brazil)

Rejane Figueiredo (University of Brasília, Brazil)

Wander Silva (University of Brasília, Brazil)

Luiz C. M. Ribeiro Júnior (University of Brasília, Brazil)

JOINT ASSESSMENT AND EVALUATION OF SENIOR DESIGN PROJECTS BY FACULTY AND INDUSTRY

Samuel J. Dickerson (University of Pittsburgh, USA)

Steven P. Jacobs (University of Pittsburgh, USA)

Adrian M. Garcia (University of Pittsburgh, USA)

David V.P. Sanchez (University of Pittsburgh, USA)

COURSE DESIGN FOR INTERNET OF THINGS USING LAB OF THINGS OF MICROSOFT RESEARCH

Gu-Min Jeong (Kookmin University, Korea)

Phuc Huu Truong (Kookmin University, Korea)

Tae-Yang Lee (Kookmin University, Korea)

Jin-Woo Choi (Kookmin University, Korea)

Miran Lee (Microsoft Research, Korea)

GENERATION OF CRITICAL MASS IN EDUCATION: AN INITIATIVE TO ENGAGEMENT

Elaine H. T. Oliveira (Federal University of Amazonas, Brazil)

Horacio A. B. F. Oliveira (Federal University of Amazonas, Brazil)

Jose R. Hughes Carvalho (Federal University of Amazonas, Brazil)

T2D: Game-Based Learning: Skill Development

Chair: Joseph Ranalli (Penn State - Hazleton Campus, USA)

1:30 PM - 3:00 PM

Room: 130C

GENERAL STRATEGY FOR DEVELOPMENT OF TEAMWORK SKILLS

Kevin Hadley (SDSM&T, USA)

Kenneth Reid (Virginia Polytechnic Institute and State University, USA)

Laura Beckmann (SDSM&T, USA)

SPLAT! ER, SHMUP? A POSTMORTEM ON A CAPSTONE PRODUCTION EXPERIENCE

Adrienne Decker (Rochester Institute of Technology, USA)

Christopher A. Egert (Rochester Institute of Technology, USA)

Andrew Phelps (Rochester Institute of Technology, USA)

***A FRAMEWORK TO HELP ANALYZE IF CREATING A GAME TO TEACH A LEARNING
OBJECTIVE IS WORTH THE WORK***

Peter Jamieson (Miami University, USA)
Lindsay Grace (American University, USA)

LEARNING MATHEMATICS THROUGH SERIOUS GAMES: AN ENGAGEMENT FRAMEWORK

Opeyemi Dele-Ajayi (Northumbria University, United Kingdom)
Rebecca Strachan (Northumbria University, United Kingdom)
Jonathan Sanderson (Northumbria University, United Kingdom)
Alison Pickard (Northumbria University, United Kingdom)

***STUDENTS' DEVELOPMENT OF INFORMATION-SEEKING SKILLS
IN A COMPUTER-AIDED QUEST***

Vadim Shmelev (ITMO University, Russia)
Maria Karpova (ITMO University, Russia)
Nikita Kogtikov (ITMO University, Russia)
Alexey Dukhanov (ITMO University, Russia)

T2E: Algorithmic Assessment Methods

Chair: Salem Ali A. Elsaiah (Bucknell University, USA)

1:30 PM - 3:00 PM

Room: 140A

USING WAVELETS TO CATEGORIZE STUDENT ATTENTION PATTERNS

M. Jean Mohammadi-Aragh (Mississippi State University, USA)
John E. Ball (Mississippi State University, USA)
Donna Jaison (Mississippi State University, USA)

MEASURING AND VISUALIZING LEARNING WITH MARKOV MODELS

Fatima Abu Deeb (Brandeis University, USA)
Kristian Kime (Brandeis University, USA)
Rebecca Torrey (Brandeis University, USA)
Timothy Hickey (Brandeis University, USA)

***INVESTIGATING CURRENT APPROACHES TO ASSESSING TEACHING EVALUATION
IN ENGINEERING DEPARTMENTS***

Nicole Pitterson (Oregon State University, USA)
Shane Brown (Oregon State University, USA)
Keisha Ann Villanueva (Oregon State University, USA)
Ann Sitomer (Oregon State University, USA)

***USING THE RANDOM FOREST CLASSIFIER TO ASSESS AND PREDICT STUDENT LEARNING
OF SOFTWARE ENGINEERING TEAMWORK***

Dragutin Petkovic (San Francisco State University, USA)
Marc Sosnick-Pérez (San Francisco State University, USA)
Kazunori Okada (San Francisco State University, USA)
Rainer Todtenhoefer (University of Applied Sciences, Fulda, Germany)
Shihong Huang (Florida Atlantic University, USA)
Nidhi Miglani (San Francisco State University, USA)
Arthur Vigil (San Francisco State University, USA)

A SYSTEMATIC MAPPING ON PEDAGOGICAL PATTERNS

Maria Lydia Fioravanti (University of São Paulo, Brazil)
Ellen Francine Barbosa (University of São Paulo, Brazil)

T2F: Computational Thinking

Chair: Leônidas O. Brandão (University of São Paulo, Brazil)

1:30 PM - 3:00 PM

Room: 140B

TEACHING PROGRAMMING BASED ON COMPUTATIONAL THINKING

Ying Li (Beihang University, P.R. China)

CAN COMPUTATIONAL THINKING HELP ME? A QUANTITATIVE STUDY OF ITS EFFECTS ON EDUCATION

Rivanilson S. Rodrigues (Federal University of Campina Grande, Brazil)

Wilkerson L. Andrade (Federal University of Campina Grande, Brazil)

Lívia M. R. Sampaio Campos (Federal University of Campina Grande, Brazil)

A REVIEW OF MODELS FOR INTRODUCING COMPUTATIONAL THINKING, COMPUTER SCIENCE AND COMPUTING IN K-12 EDUCATION

Fredrik Heintz (Linköping University, Sweden)

Linda Mannila (Åbo Akademi University, Finland)

Tommy Färnqvist (Linköping University, Sweden)

TRACKING AND VISUALIZING TIME MANAGEMENT FOR SELF-REGULATED LEARNERS

Mario Manso-Vázquez (University of Vigo, Spain)

Manuel Caeiro-Rodríguez (University of Vigo, Spain)

Martín Llamas-Nistal (University of Vigo, Spain)

INTRODUCING BEA INTO SELF-REGULATED LEARNING TO PROVIDE FORMATIVE ASSESSMENT SUPPORT

Manuel Caeiro-Rodríguez (University of Vigo, Spain)

Martín Llamas-Nistal (University of Vigo, Spain)

Fernando Mikic-Fonte (University of Vigo, Spain)

T2G: STEAM

Chair: James J. Sluss, Jr. (The University of Oklahoma, USA)

1:30 PM - 3:00 PM

Room: 140C

MUSIC EDUCATION MEETS COMPUTER SCIENCE AND ENGINEERING EDUCATION

Carlos N. Silla Jr. (Pontificia Universidade Católica do Paraná (PUCPR), Brazil)

André L. Przybysz (Federal University of Technology of Parana (UTFPR), Brazil)

Wellington V. Leal (Federal University of Technology of Parana (UTFPR), Brazil)

THE UNIVERSITY OF CENTRAL FLORIDA STEAM PROGRAM: WHERE ENGINEERING EDUCATION AND ART MEET

Carla Poindexter (The University of Central Florida, USA)

Debra Reinhart (The University of Central Florida, USA)

Bonnie Swan (The University of Central Florida, USA)

Victoria McNeil (The University of Central Florida, USA)

STEAM APPROACH BY INTEGRATING THE ARTS AND STEM THROUGH ORIGAMI IN K-12

Jamie L Kennedy (Drexel University, USA)

Erica Lee (GAMP High School, USA)

Adam Fontecchio (Drexel University, USA)

DEVELOPMENT OF COURSE MODULES FOR MULTIDISCIPLINARY STEM EDUCATION

Andreas Spanias (Clarkson University, USA)
Mahesh K. Banavar (Clarkson University, USA)
Henry Braun (Arizona State University, USA)
Photini Spanias (Arizona State University, USA)
Yongpeng Zhang (Prairie View A&M University, USA)

ROBOTIC EDUCATIONAL TOOL TO ENGAGE STUDENTS ON ENGINEERING

Pedro Plaza Merino (Siemens Rail Automation, SAU, Spain)
Elio Sancristobal Ruiz (Spanish University for Distance Education (UNED), Spain)
German Carro Fernandez (Spanish University for Distance Education (UNED), Spain)
Manuel Castro Gil (Spanish University for Distance Education (UNED), Spain)

T2H: Program Assessment and Program Development

Chair: Doron Faran (ORT Braude College, Israel)

1:30 PM - 3:00 PM

Room: 160A

QUALITY IMPROVEMENT WITH AUTOMATED ENGINEERING PROGRAM EVALUATIONS USING PERFORMANCE INDICATORS CLASSIFIED BASED ON BLOOM'S 3 DOMAINS

Wajid Hussain (Islamic University, Saudi Arabia)
M. F. Addas (Islamic University, Saudi Arabia)
Fong Mak (Gannon University, USA)

ALIGNING QUALITY ASSURANCE AT THE COURSE UNIT AND EDUCATIONAL PROGRAM LEVELS

Björn Þór Jónsson (Reykjavík University, Iceland)
Marta Kristín Lárusdóttir (Reykjavik University, Iceland)
Mats Daniels (Uppsala University, Sweden)
Alison Clear (EIT, New Zealand)
Tony Clear (Auckland University of Technology, New Zealand)
Roger McDermott (RGU, United Kingdom)

A FRAMEWORK FOR A SIMPLE AND EFFECTIVE ASSESSMENT AND CQI PROCESS

William Lasher (Penn State Behrend, USA)
Russell L. Warley (Penn State Behrend, USA)
Jonathan Meckley (Penn State Behrend, USA)

COMPLEMENTARY TRAINING PROGRAMME FOR ELECTRICAL AND COMPUTER ENGINEERING STUDENTS THROUGH AN INDUSTRIAL-ACADEMIC COLLABORATION

Felipe R. Monteiro (Federal University of Amazonas, Brazil)
Phillipe A. Pereira (Federal University of Amazonas, Brazil)
Lucas C. Cordeiro (Federal University of Amazonas, Brazil)
Cicero F. F. Costa Filho (Federal University of Amazonas, Brazil)
Marly G. F. Costa (Federal University of Amazonas, Brazil)

T2I: Credentials and Accreditation

Chair: Paul B. Crilly (United States Coast Guard Academy, USA)

1:30 PM - 3:00 PM

Room: 160B

SUCCESSFUL ACCREDITATION OF THE ELECTRICAL ENGINEERING PROGRAM OFFERED IN TWO CAMPUSES AT CARIBBEAN UNIVERSITY

Hermes E. Calderón (Caribbean University, Puerto Rico)
Ramón Vásquez (Caribbean University, Puerto Rico)
Diego Aponte Roa (Caribbean University, Puerto Rico)
Maritza Del Valle (Caribbean University, Puerto Rico)

CREDENTIALING IN THE CSET EDUCATION CHANGE PROCESS

Jennifer Karlin (University of Southern Maine, USA)
Rebecca Bates (Minnesota State University, Mankato, USA)
Cheryl Allendoerfer (University of Washington, USA)
Dan Ewert (North Dakota State University, USA)
Ron Ulseth (Itasca Community College, USA)

AN ANALYSIS OF THE USE OF BADGES IN AN EDUCATIONAL EXPERIMENT

José A. Ruiperez-Valiente (Universidad Carlos III de Madrid, Spain)
Pedro J. Muñoz -Merino (Universidad Carlos III de Madrid, Spain)
Carlos Delgado Kloos (Universidad Carlos III de Madrid, Spain)

ENGINEERING DIPLOMA CURRICULUM NITTTR-MSBTE MODEL 2016

S.K. Gupta (NITTTR, India)
Joshua Earnest (NITTTR, India)

FINDING GOOD FRIENDS TO LEARN FROM AND TO INSPIRE

Jens Bennedsen (University of Aarhus, Denmark)
Siegfried Rouvrais (Institut Mines Telecom, France)

T2J: Conceptions and Misconceptions

Chair: Tanya Kunberger (Florida Gulf Coast University, USA)
1:30 PM - 3:00 PM
Room: 160C

***A FACTOR ANALYSIS OF STATICS CONCEPT INVENTORY DATA
FROM PRACTICING CIVIL ENGINEERS***

Oai Ha (Oregon State University, USA)
Shane Brown (Oregon State University, USA)

***USING SIMULATION AND STRUCTURED GROUP WORK
TO ADDRESS STATISTICAL MISCONCEPTIONS***

Scott Streiner (University of Pittsburgh, USA)
Mary Besterfield-Sacre (University of Pittsburgh, USA)
Sam Donovan (University of Pittsburgh, USA)

***ENABLING DEEP CONCEPTUAL LEARNING IN COMPUTING COURSES
THROUGH CONFLICT-BASED COLLABORATIVE LEARNING***

Swaroop Joshi (The Ohio State University, USA)
Neelam Soundarajan (The Ohio State University, USA)

THE DEVELOPMENT OF A CONCEPT INVENTORY FOR ENGINEERING GRAPHICS

Steven Y. Nozaki (The Ohio State University, USA)
Sheryl A. Sorby (The Ohio State University, USA)
Nancy E. Study (Penn State Behrend, USA)
Heidi M. Steinhauer (Embry-Riddle Aeronautical University, USA)
Mary Sadowski (Purdue University, USA)
Ronald Miller (Colorado School of Mines, USA)

***THE IMPACT OF SUPERVISED HOMEWORK SESSIONS AND SAT-MATH SCORES
ON ACADEMIC PERFORMANCE IN AN ADVANCED UNDERGRADUATE COURSE***

Waterloo Tsutsui (Purdue University, USA)
Michael C. Loui (Purdue University, USA)

T3A: Special Session: Innovation T-Ball: Everybody Wins!!

3:30 PM – 5:00 PM

Room: 170A

INNOVATION T-BALL: EVERYBODY WINS!!

Stephanie Cutler (The Pennsylvania State University, USA)

Thomas Litzinger (The Pennsylvania State University, USA)

Sarah Zappe (The Pennsylvania State University, USA)

Michael Alley (The Pennsylvania State University, USA)

T3B: Panel: Launching Curricular Guidelines for Computer Engineering: CE2016

3:30 PM – 5:00 PM

Room: 170B

LAUNCHING CURRICULAR GUIDELINES FOR COMPUTER ENGINEERING: CE2016

John Impagliazzo (Hofstra University, USA)

Susan Conry (Clarkson University, USA)

Eric Durant (Milwaukee School of Engineering, USA)

Joseph Hughes (Georgia Tech, USA)

Russ Meier (Milwaukee School of Engineering, USA)

T3C: Educating Students on Professional Ethics

Chair: James Huff (Harding University, USA)

3:30 PM – 5:00 PM

Room: 130B

***PUBHUB: A WEB-BASED COMPENDIUM TO CATALYZE
UNDERGRADUATE RESEARCH PUBLICATION***

Rebecca Ligrani (Penn State University, USA)

Irena Gorski (Penn State University, USA)

Sarah Ritter (Penn State University, USA)

Khanjan Mehta (Penn State University, USA)

WHAT DO FIRST-YEAR ENGINEERS AND OTHERS CONSIDER CHEATING?

Brian E. Moyer (University of Pittsburgh at Johnstown, USA)

HOW SOFTWARE WORKS: COMPUTATIONAL THINKING AND ETHICS BEFORE CSI

Andrew Scott (Western Carolina University, USA)

Scott Barlowe (Western Carolina University, USA)

***MACROETHICS INSTRUCTION IN CO-CURRICULAR SETTINGS:
THE DEVELOPMENT AND RESULTS OF A NATIONAL SURVEY***

Daniel W. Knight (University of Colorado Boulder, USA)

Angela R. Bielefeldt (University of Colorado Boulder, USA)

Nathan E. Canney (Seattle University, USA)

Christopher Swan (Tufts University, USA)

***A COMMUNICATIVE APPROACH TO EXPLORING THE DEVELOPMENT OF ETHICAL
TEAM PROCESSES OVER TIME***

Megan Kenny Feister (Purdue University, USA)

Carla B. Zoltowski (Purdue University, USA)

Patrice M. Buzzanell (Purdue University, USA)

David Torres (Purdue University, USA)

T3D: Game-Based Learning: Stakeholder Perspectives
Chair: Swaroop Joshi (The Ohio State University, USA)
3:30 PM – 5:00 PM
Room: 130C

UNDERSTANDING THE ATTITUDE AND INTENTION TOWARDS ADOPTING VIRTUAL REALITY TECHNOLOGY IN CLASSROOM

JooYeon Christina Ri (Santa Clara University, USA)
Simon G. M. Koo (Ananse, Inc., USA)

STUDENT PERSPECTIVES ON APPLICATION OF GAME-BASED LEARNING WITHIN A GRADUATE-LEVEL ENGINEERING COURSE

Cheryl Bodnar (Rowan University, USA)
Renee Clark (University of Pittsburgh, USA)
Jesse Davis (University of Pittsburgh, USA)
Tom Congedo (University of Pittsburgh, USA)
Daniel Cole (University of Pittsburgh, USA)

GAMIFYING AN ONLINE APPROACH FOR PROMOTING GAME DEVELOPMENT LEARNING AND CONTEST: AN EXPERIENCE REPORT

Murilo Rocha Regalado (Federal University of Rio Grande do Norte - UFRN, Brazil)
Eduardo Aranha (Federal University of Rio Grande do Norte - UFRN, Brazil)
Thiago Reis da Silva (Federal Institute of Education, Science and Technology of Maranhão – IFMA, Brazil)

THE EFFECTS OF GAMIFICATION ON ENGINEERING LAB ACTIVITIES

Eunsik Kim (The Pennsylvania State University, USA)
Ling Rothrock (The Pennsylvania State University, USA)
Andris Freivalds (The Pennsylvania State University, USA)

T3E: Student Perceptions of Evaluation and Assessment

Chair: Rogério Garcia (São Paulo State University, Brazil)
3:30 PM – 5:00 PM
Room: 140A

FRESHMAN ENGINEERING STUDENT PERCEPTIONS OF ACADEMIC FEEDBACK – A CASE STUDY FROM DIGITAL SYSTEMS I

Rangith Baby Kuriakose (University of Technology, South Africa)

STUDENT ACCEPTANCE AND PERFORMANCE OF A VIRTUAL PLATFORM FOR TRAINING AND EVALUATION OF STATICS COURSE

Jorge Luis Restrepo Ochoa (EAFIT University, Colombia)
Jaime Leonardo Barbosa Pérez (EAFIT University, Colombia)
Julian Arenas Berrio (EAFIT University, Colombia)

STUDENT REFLECTIONS ON STANDARDS-BASED GRADED ASSIGNMENTS

Heidi A. Diefes-Dux (Purdue University, USA)

T3F: Learning Software Development

Chair: Carlos Silla (Pontificia Universidade Católica do Paraná, Brazil)
3:30 PM – 5:00 PM
Room: 140B

UNCOVERING DIFFICULTIES IN LEARNING FOR THE INTERMEDIATE PROGRAMMER

Adrienne Decker (Rochester Institute of Technology, USA)
David Simkins (Rochester Institute of Technology, USA)

DEBUGGING STUDENTS' DEBUGGING PROCESS

Axel Böttcher (Munich University of Applied Sciences, Germany)
Kathrin Schlierkamp (Munich University of Applied Sciences, Germany)
Daniela Zehetmeier (Munich University of Applied Sciences, Germany)
Veronika Thurner (Munich University of Applied Sciences, Germany)

7 SURPRISING LESSONS LEARNED FROM TEACHING IOS PROGRAMMING TO 30,000+ MOOC STUDENTS

Parham Aarabi (University of Toronto, Canada)
Narges Norouzi (University of Toronto, Canada)
Jack Wu (University of Toronto, Canada)
Michael Spears (University of Toronto, Canada)

EXAMINING THE INTERMEDIATE PROGRAMMERS UNDERSTANDING OF THE LEARNING PROCESS

David Simkins (Rochester Institute of Technology, USA)
Adrienne Decker (Rochester Institute of Technology, USA)

PROGRAMMING CASE STUDIES AS CONTEXT FOR ACTIVE LEARNING ACTIVITIES IN THE CLASSROOM

Yonglei Tao (Grand Valley State University, USA)
Jagadeesh Nandigam (Grand Valley State University, USA)

T3G: Mathematics and Statistics

Chair: Jacqueline McNeil (University of Louisville, USA)

3:30 PM – 5:00 PM

Room: 140C

USING INQUIRY-BASED LEARNING IN ENGINEERING STATISTICS COURSES

Christopher Golubski (University of Texas at Austin, USA)

IMPLEMENTING SCHEMA-BASED ASSESSMENT IN ENGINEERING STATISTICS COURSES

Walter M. Stroup (The University of Texas at Austin)
Christopher Golubski (The University of Texas at Austin, USA)

THE INFLUENCE OF EDUCATIONAL LEARNING PATHS IN ACADEMIC SUCCESS OF MATHEMATICS IN ENGINEERING UNDERGRADUATE

Maria Emília Bigotte (Engineering Institute of Polytechnic Institute of Coimbra, Portugal)
Anabela Gomes (Engineering Institute of Polytechnic Institute of Coimbra, Portugal)
João Ricardo Branco (Engineering Institute of Polytechnic Institute of Coimbra, Portugal)
Teresa Pessoa (University of Coimbra, Portugal)

INTERNET-BASED TUTORIAL PROVIDING MATHEMATICAL COMPLEMENTS FOR TECHNICAL MASTER STUDENTS: TIMEMATHCOM

M. Rosa Estela-Carbonell (Universitat Politècnica de Catalunya, BarcelonaTech, Spain)
Pedro Díez (Universitat Politècnica de Catalunya, BarcelonaTech, Spain)

A DYNAMIC LEARNING MODEL FOR ACCELERATED PRE-MATRICULATION MATHEMATICS PROGRAMS: A WORK-IN- PROGRESS

Henry Griffith (Michigan State University, USA)
Angela Griffith (Wright State University, USA)

T3H: Computer-Based Learning and Courseware Technologies
Chair: Charles Wallace (Michigan Technological University, USA)
3:30 PM – 5:00 PM
Room: 160A

***INFORMATION RESOURCE BASED ON SCIENTIFIC SOFTWARE AS A CORE OF
INTERDISCIPLINARY LEARNING RESOURCES***

Maria Karpova (ITMO University, Russia)
Vadim Shmelev (ITMO University, Russia)
Alexey Dukhanov (ITMO University, Russia)

***EXPLORATION OF THE COMPUTER HARDWARE EXPERIMENT TEACHING METHOD
BASED ON THE CLOUD PLATFORM***

Quan Chengbin (Tsinghua University, P.R. China)
Chen Yongqiang (Tsinghua University, P.R. China)
Li ShanShan (Tsinghua University, P.R. China)
Zhao Youjian (Tsinghua University, P.R. China)

***INTEGRATING INTERNET OF THINGS (IOT) INTO STEM UNDERGRADUATE EDUCATION:
CASE STUDY OF A MODERN TECHNOLOGY INFUSED COURSEWARE
FOR EMBEDDED SYSTEM COURSE***

Jing (Selena) He (Kennesaw State University, USA)
Dan Chia-Tien Lo (Kennesaw State University, USA)
Ying Xie (Kennesaw State University, USA)
Jonathan Lartigue (Kennesaw State University, USA)

***WEX-HIL: DESIGN OF A WIRELESS EXTENSIBLE HARDWARE-IN-THE-LOOP REAL-TIME
SIMULATOR FOR ELECTRIC VEHICLE APPLICATIONS***

Yong-Kyu Jung (Gannon University, USA)
Fong Mak (Gannon University, USA)
Fnu Qinggele (Gannon University, USA)
Idrees Alzahid (Gannon University, USA)

***E-NABLING EDUCATION: CURRICULA AND MODELS FOR TEACHING
STUDENTS TO PRINT HANDS***

Stephen Jacobs (RIT MAGIC Center, USA)
Jon Schull (RIT MAGIC Center, USA)
Perry White (RIT MAGIC Center, USA)
Richard Lehrer (RIT MAGIC Center, USA)
Akanksha Vishwakarma (RIT MAGIC Center, USA)
Andrea Bertucci (RIT MAGIC Center, USA)

T3I: Student Beliefs and Motivation

Chair: Mounir Ben Ghalia (The University of Texas Rio Grande Valley, USA)
1:30 PM – 3:00 PM
Room: 160B

***MEASURING ENGINEERING EPISTEMIC BELIEFS
IN UNDERGRADUATE ENGINEERING STUDENTS***

Courtney Faber (The College of New Jersey, USA)
Penelope Vargas (Clemson University, USA)
Lisa Benson (Clemson University, USA)

UNDERSTANDING STUDENTS' PERCEPTION OF ACADEMIC AND PROFESSIONAL RELEVANCE IN STEM COURSES

Yun-Hsin (Cynthia) Chen (Franklin W. Olin College of Engineering, USA)
Allison Tau (Franklin W. Olin College of Engineering, USA)
Yevgeniya V. Zastavker (Franklin W. Olin College of Engineering, USA)
Jonathan D. Stolk (Franklin W. Olin College of Engineering, USA)
Alex Dillon (Franklin W. Olin College of Engineering, USA)
Michael D. Gross (Wake Forest University, USA)

INTERNALIZATION AND EXTERNALIZATION IN THE CLASSROOM: HOW DO THEY EMERGE AND WHY IS IT IMPORTANT?

Pinar Demetci (Franklin W. Olin College of Engineering, USA)
Caz Nichols (Franklin W. Olin College of Engineering, USA)
Yevgeniya V. Zastavker (Franklin W. Olin College of Engineering, USA)
Jonathan D. Stolk (Franklin W. Olin College of Engineering, USA)
Alex Dillon (Franklin W. Olin College of Engineering, USA)
Michael D. Gross (Wake Forest University, USA)

TRAIT MINDFULNESS IN AN ENGINEERING CLASSROOM: AN EXPLORATION OF THE RELATIONSHIP BETWEEN MINDFULNESS, ACADEMIC SKILLS, AND PROFESSIONAL SKILLS

Beth Rieken (Stanford University, USA)
Mark Schar (Stanford University, USA)
Sheri Sheppard (Stanford University, USA)

CAREER GOALS, SELF-EFFICACY AND PERSISTENCE IN ENGINEERING STUDENTS

Philip R. Brown (Virginia Tech, USA)
Holly M. Matusovich (Virginia Tech, USA)

T3J: Design Education

Chair: Charlotte de Vries (Pennsylvania State University Erie, USA)

3:30 PM – 5:00 PM

Room: 160C

ENGINEERS' WRITTEN FEEDBACK ON DESIGN

Farshid Marbouti (San Jose State University, USA)
Heidi A. Diefes-Dux (Purdue University, USA)
Monica E. Cardella (Purdue University, USA)
Ali Shafaat (Purdue University, USA)

AN AUTOMATIC GENERATOR AND CORRECTOR OF MULTIPLE CHOICE TESTS WITH RANDOM ANSWER KEYS

Francisco de Assis Zampiroli (Federal University of ABC, Brazil)
Valério Ramos Batista (Federal University of ABC, Brazil)
José Artur Quilici-Gonzalez (Federal University of ABC, Brazil)

A LEARNING TOOL TO DEVELOP SUSTAINABLE PROJECTS

Fermín Sánchez-Carracedo (Universitat Politècnica de Catalunya - BarcelonaTech, Spain)
Jose Cabre (Universitat Politècnica de Catalunya - BarcelonaTech, Spain)
Marc Alier (Universitat Politècnica de Catalunya - BarcelonaTech, Spain)
Eva Vidal (Universitat Politècnica de Catalunya - BarcelonaTech, Spain)
David López (Universitat Politècnica de Catalunya - BarcelonaTech, Spain)
Carme Martín (Universitat Politècnica de Catalunya - BarcelonaTech, Spain)
Jordi García (Universitat Politècnica de Catalunya - BarcelonaTech, Spain)

INJECTION OF BUSINESS CODING STANDARDS AND PRACTICES TO EMBEDDED SOFTWARE COURSES

Donald V. MacKellar Jr. (Gannon University, USA)

EXPLORING STUDENTS' EXPERIMENTATION STRATEGIES IN ENGINEERING DESIGN USING AN EDUCATIONAL CAD TOOL

Ying Ying Seah (Purdue University, USA)

Camilo Vieira (Purdue University, USA)

Chandan Dasgupta (Purdue University, USA)

Alejandra J. Magana (Purdue University, USA)

Friday, October 14

F1A: Panel: Developments in Global Software Engineering Education

10:00 AM - 12:00 PM

Room: 170A

DEVELOPMENTS IN GLOBAL SOFTWARE ENGINEERING EDUCATION

Tony Clear (Auckland University of Technology, New Zealand)

Sarah Beecham (University of Limerick, Ireland)

John Barr (Ithaca College, USA)

Mats Daniels (Uppsala University, Sweden)

Michael Oudshoorn (Wentworth Institute of Technology, USA)

John Noll (University of Limerick, Ireland)

F1B: Panel: Integrating Systems Engineering and Systems Thinking into Undergraduate Engineering Education

10:00 AM - 12:00 PM

Room: 170B

INTEGRATING SYSTEMS ENGINEERING AND SYSTEMS THINKING INTO UNDERGRADUATE ENGINEERING EDUCATION

Rick Adcock (Cranfield University Centre for Systems Engineering, United Kingdom)

Alice Squires (Washington State University, USA)

Peggy Brouse (George Mason University, USA)

Mario Simoni (Rose-Hulman Institute of Technology, USA)

Fred Looft (Worcester Polytechnic Institute, USA)

F1C: Faculty Development: Transferring Innovation

Chair: Molly Hathaway Goldstein (Purdue University, USA)

10:00 AM - 12:00 PM

Room: 130B

THE CONNECTED LEARNER: ENGAGING FACULTY TO CONNECT COMPUTING STUDENTS TO PEERS, PROFESSION AND PURPOSE

Mary Lou Maher (University of North Carolina at Charlotte, USA)

Bojan Cukic (University of North Carolina at Charlotte, USA)

Larry Mays (University of North Carolina at Charlotte, USA)

Steven Rogelberg (University of North Carolina at Charlotte, USA)

Celine Latulipe (University of North Carolina at Charlotte, USA)

Jamie Payton (University of North Carolina at Charlotte, USA)

Audrey Rorrer (University of North Carolina at Charlotte, USA)

Tonya Frevert (University of North Carolina at Charlotte, USA)

ACADEMICS' EXPERIENCE OF TEACHING OPEN ENDED GROUP PROJECTS: A PHENOMENOGRAPHIC STUDY

Marianne Voogt (Uppsala University, Sweden)

Chuan Sheng Chen (Uppsala University, Sweden)

Neena Thota (Uppsala University, Sweden)

PROVIDING MEANINGFUL CHANGE IN THE ENGINEERING CLASSROOM

Matthew S. Barner (Oregon State University, USA)

Shane A. Brown (Oregon State University, USA)

LESSONS IN TRANSFER: BETTER UNDERSTANDING OF ENGINEERING STUDENTS' METACOGNITIVE DEVELOPMENT

Sarah A. Williams (Virginia Tech, USA)
John Morelock (Virginia Tech, USA)
Holly Matusovich (Virginia Tech, USA)
Patrick Cunningham (Rose-Hulman Institute of Technology, USA)

THE USE OF ONLINE MATERIALS IN UNDERGRADUATE COMPUTER SCIENCE CLASSROOMS: EXAMINING FACTORS FOR ADOPTING NEW CURRICULUM AND INSTRUCTION

Tim Weston (University of Colorado, USA)
Beth Quinn (University of Colorado, USA)

AN ADAPTABLE MODEL FOR TEACHING MOBILE APP DEVELOPMENT

Andrey Esakia (Virginia Tech, USA)
D. Scott McCrickard (Virginia Tech, USA)

FID: Self-Regulated Learning

Chair: Madalene Spezialetti (Trinity College, USA)

10:00 AM - 12:00 PM

Room: 130C

CHARACTERISTICS OF SELF-REGULATION OF ENGINEERING STUDENTS TO PREDICT AND IMPROVE THEIR ACADEMIC PERFORMANCE

Julietta Noguez (Tecnologico de Monterrey, Mexico)
Luis Neri (Tecnologico de Monterrey, Mexico)
Andres Gonzalez-Nucamendi (Tecnologico de Monterrey, Mexico)
Victor Robledo-Rella (Tecnologico de Monterrey, Mexico)

RESEARCH EXPERIENCES FOR UNDERGRADUATES (REU) ON SELF-REGULATED LEARNING IN ENGINEERING EDUCATION

Ning Fang (Utah State University, USA)
Oenardi Lawanto (Utah State University, USA)
Wade Goodridge (Utah State University, USA)
Idalis Villanueva (Utah State University, USA)

STUDENT SELF-REGULATION IN CAPSTONE DESIGN COURSES: A CASE STUDY OF TWO PROJECT TEAMS

Oenardi Lawanto (Utah State University, USA)
Andreas Febrian (Utah State University, USA)

FACILITATING HABITUAL REFLECTION IN STUDENTS - APPLICATION TO AN ENGINEERING CAPSTONE PROJECT

Michael Marsolek (Seattle University, USA)
Nathan Canney (Seattle University, USA)

FIE: Robotics

Chair: Jose Reginaldo Hughes Carvalho (Federal University of Amazonas, Brazil)

10:00 AM - 12:00 PM

Room: 140A

INTRODUCING COMPUTER ENGINEERING MAJOR FOR FIRST YEAR STUDENTS USING ROBOTIC PROJECTS

Georges El-Howayek (Valparaiso University, USA)

TEACHING DESIGN WITH A TINKERING-DRIVEN ROBOT HACK

Tom J. Zajdel (University of California, Berkeley, USA)

Michel M. Maharbiz (University of California, Berkeley, USA)

ROBOTIC FOOTBALL DANCE TEAM: AN ENGINEERING FINE-ARTS INTERDISCIPLINARY LEARNING EXPERIENCE

Danielle Desmond (Valparaiso University, USA)

Madeline Horton (Valparaiso University, USA)

Adam Morrison (Valparaiso University, USA)

Sami Khorbotly (Valparaiso University, USA)

UTILIZING ENGINEERING TO TEACH NON-TECHNICAL DISCIPLINES: CASE STUDIES OF ROBOTICS WITHIN MIDDLE SCHOOL ENGLISH AND HEALTH CLASSES

Emily Hamner (Carnegie Mellon University, USA)

Lauren Zito (Carnegie Mellon University, USA)

Jennifer Cross (Carnegie Mellon University, USA)

Brett Slezak (Allegheny Valley School District, USA)

Sue Mellon (Allegheny Valley School District, USA)

Heather Harapko (Allegheny Valley School District, USA)

Michele Welter (Allegheny Valley School District, USA)

ROBOTICS INTEGRATION TO CREATE AN AUTHENTIC LEARNING ENVIRONMENT IN ENGINEERING EDUCATION

Ahmad Khanlari (University of Toronto, Canada)

FIF: Programming Courses and Concepts

Chair: Clifford De Raffaele (Middlesex University Malta, Malta)

10:00 AM - 12:00 PM

Room: 140B

EVOLVING AN INTRODUCTORY PROGRAMMING COURSE: IMPACTS OF STUDENT SELF-EMPOWERMENT, GUIDED HANDS-ON TIMES, AND SELF-DIRECTED TRAINING

Patrick Seeling (Central Michigan University, USA)

MEASUREMENT RANGE INCREMENT IN A METHOD FOR EVALUATING PANORAMIC UNDERSTANDING OF PROGRAMMING

Dick Martinez Calderon (Kobe University, Japan)

Kin Man (Kobe University, Japan)

Hidenari Kiyomitsu (Kobe University, Japan)

Kazuhiro Ohtsuki (Kobe University, Japan)

Yukinobu Miyamoto (Kobe Institute of Computing, Japan)

Yi Sun (Kobe Institute of Computing, Japan)

Masami Hirabayashi (Institute of Advanced Media Arts and Sciences, Japan)

TOWARDS AN M-LEARNING REQUIREMENTS CATALOG FOR THE DEVELOPMENT OF EDUCATIONAL APPLICATIONS FOR THE TEACHING OF PROGRAMMING

Anderson S. Marcolino (Institute of Science and Computational Mathematics (ICMC-USP), Brazil)

Ellen Barbosa (Institute of Science and Computational Mathematics (ICMC-USP), Brazil)

EXAMINING STUDENTS' CONCERNS RELATED TO ONLINE DELIVERY OF AN INTRODUCTORY COMPUTER PROGRAMMING COURSE

Asad Azemi (Pennsylvania State University, USA)

EVIDENCE-BASED RE-DESIGN OF AN INTRODUCTORY COURSE "PROGRAMMING IN C"

Dion Timmermann (Hamburg University of Technology, Germany)

Christian Kautz (Hamburg University of Technology, Germany)

Volker Skwarek (Hamburg University of Applied Sciences, Germany)

INCLASS ASSISTANT, ENHANCING STUDENT CLASS PARTICIPATION

Yolanda Martinez-Trevino (Tecnologico de Monterrey, Mexico)

FIG: Service and Learning

Chair: Carla Zoltowski (Purdue University, USA)

10:00 AM - 12:00 PM

Room: 140C

STUDENT OUTCOMES OF SHORT-TERM INTERNATIONAL HUMANITARIAN ENGINEERING FIELDWORK

A.R. Nassar (The Pennsylvania State University, USA)

K. Holmes (The Pennsylvania State University, USA)

K. Mehta (The Pennsylvania State University, USA)

TEACHING FIRST YEAR ENGINEERING STUDENTS ENGINEERING DESIGN PROCESS AND PROBLEM SOLVING THROUGH SERVICE LEARNING PROJECTS

Lin Zhao (Gannon University, USA)

Karinna Vernaza (Gannon University, USA)

SERVING WITH ENGINEERING SKILLS WITHIN 15 MILES OF CAMPUS: THE SCHOLARS OF EXCELLENCE IN ENGINEERING AND COMPUTER SCIENCE PROGRAM

Theresa M. Vitolo (Gannon University, USA)

Barry J. Brinkman (Gannon University, USA)

Karinna M. Vernaza (Gannon University, USA)

Scott E. Steinbrink (Gannon University, USA)

HOW SERVICE LEARNING CAN BE OFFERED AS CAPSTONE

Ali Shafaat (Purdue University, USA)

Behzad Esmaeili (University of Nebraska-Lincoln, USA)

Farshid Marbouti (San Jose State University, USA)

Brandon Fulk (Purdue University, USA)

USING THE EFFORT OF ACADEMIC PROJECTS FOR THE COMMUNITY SERVICE: A SOFTWARE ENGINEERING PRACTICAL APPROACH

Jakeline Marcos-Abed (Tecnologico de Monterrey, Mexico)

COMMUNITY PARTNERS' PERSPECTIVES ON THE OUTCOMES FROM INTERNATIONAL SERVICE-LEARNING PROGRAMS:PROJECT SCOPE AND METHOD

Neha Choudhary (Purdue University, USA)

Brent K. Jesiek (Purdue University, USA)

FIH: Pathways to Engineering Degrees

Chair: Beth Myers (University of Colorado Boulder, USA)

10:00 AM - 12:00 PM

Room: 160A

CURRICULAR CHOICE AND TECHNICAL--NON-TECHNICAL BALANCE IN COMPUTER SCIENCE AND ENGINEERING DEGREE PROGRAMS

M.H. Forbes (University of Colorado Boulder, USA)

A.R. Bielefeldt (University of Colorado Boulder, USA)

J.F. Sullivan (University of Colorado Boulder, USA)

A RANDOM WALK ON THE MAJOR PATH SPACE: EXAMINING STUDENT PROGRESSION AS A RANDOM PROCESS USING MARKOV CHAINS

George Ricco (University of Kentucky, USA)

James Ryan (Chubb Insurance, USA)

EXAMINING ENGINEERING STUDENTS' MAJOR SELECTION: DEVELOPING BASELINE QUANTITATIVE RESULTS TO INVESTIGATE MAJOR SELECTION AND CHANGE

Jamie L. Paulson (The Ohio State University, USA)

Rachel L. Kajfez (The Ohio State University, USA)

Krista M. Kecskemety (The Ohio State University, USA)

COMBINING PROJECTS AND INFORMATIONAL SESSIONS TO CREATE A COMPREHENSIVE INTRODUCTION TO THE DEPARTMENT

Rebecca M. Reck (Kettering University, USA)

Girish Krishnan (University of Illinois at Urbana-Champaign, USA)

ADDRESSING MISCONCEPTIONS ABOUT ENGINEERING THROUGH STUDENT-INDUSTRY INTERACTION IN A VIDEO-AUGMENTED 3D IMMERSIVE VIRTUAL WORLD

Sasha Nikolic (University of Wollongong, Australia)

Mark J. W. Lee (Charles Sturt University, Australia)

Tom Goldfinch (University of Wollongong, Australia)

Christian H. Ritz (University of Wollongong, Australia)

FIH: Graduate Student Education

Chair: Wendy Fisher (Colorado School of Mines, USA)

10:00 AM - 12:00 PM

Room: 160B

CONSIDERATIONS FOR THE DESIGN OF A HANDS-ON WIRELESS COMMUNICATIONS GRADUATE COURSE BASED ON SOFTWARE-DEFINED RADIO

Miguel Bazdresch (Rochester Institute of Technology, USA)

CUSTOMIZING BIOINFORMATICS GRADUATE PROGRAMS FOR DIVERSIFIED STUDENT BACKGROUNDS

Huanmei Wu (School of Informatics and Computing Indianapolis, USA)

Oindrila Raha (School of Informatics and Computing Indianapolis, USA)

Jian Zhang (Shenzhen Polytechnic, P.R. China)

***AN EXPERIENCE REPORT OF INTER-INSTITUTIONAL ENGINEERING DEGREE PROGRAMS
IN THE AMAZON REGION***

Vicente F. de Lucena Jr. (Federal University of Amazonas, Brazil)

Jose Pinheiro Queiroz Neto (Federal Institute of Education, Science and Technology, Brazil)

Juliana M.V.M. de Lucena (Federal Institute of Education, Science and Technology, Brazil)

***THE DISSERTATION INSTITUTE: MOTIVATING DOCTORAL ENGINEERING STUDENTS
TOWARD DEGREE COMPLETION***

Indhira M. Hasbún (Virginia Tech, USA)

Holly M. Matusovich (Virginia Tech, USA)

Stephanie G. Adams (Virginia Tech, USA)

***UNDERSTANDING THE ROLE OF KNOWLEDGE RELATED TO FINANCIAL RESOURCES
ON DECISIONS TO ATTEND GRADUATE SCHOOL***

Marian S. Kennedy (Clemson University, USA)

Shelby K. Lanier (Clemson University, USA)

Katherine M. Ehlert (Clemson University, USA)

Kathryn K. Pegues (Clemson University, USA)

Karen A. High (Clemson University, USA)

Julia L. Sharp (Clemson University, USA)

FIJ: Integrating Business and Engineering

Chair: Donald V. MacKellar, Jr. (Gannon University, USA)

10:00 AM - 12:00 PM

Room: 160C

***USING INNOVATION AS A CATALYST FOR INTEGRATING BUSINESS
AND ENGINEERING EDUCATION***

David W. Keck (University of Nebraska - Lincoln, USA)

Ian J. Cottingham (University of Nebraska - Lincoln, USA)

***THEORY-BASED COURSE DESIGN FOR PROFESSIONAL MASTER'S DEGREE PROGRAM
IN BUSINESS ENGINEERING***

Brit-Maren Block (Leuphana University of Lüneburg, Germany)

SYSTEMS ENGINEERING AS INTEGRATOR BETWEEN ENGINEERING AND BUSINESS

Barend W Botha (University of Johannesburg, South Africa)

***INNOVATIVE BUSINESS ANALYSIS CURRICULUM FOR COMPUTER SCIENCE,
IT AND ENGINEERING PROGRAMS***

Vladimir Uskov (Bradley University, USA)

Urvashi Singh (Bradley University, USA)

Mounica Yalamanchili (Bradley University, USA)

Archana Penumatsa (Bradley University, USA)

***MASTER'S OF ENGINEERING MANAGEMENT:
GRADUATION RATES LAGGING BEHIND GROWTH RATE***

A. Marnewick (University of Johannesburg, South Africa)

JHC Pretorius (University of Johannesburg, South Africa)

***USING EXTERNAL BUSINESS PLAN COMPETITIONS TO DRIVE INNOVATION
AND EFFECTIVE CROSS-DISCIPLINARY COLLABORATION***

Davide Piovesan (Gannon University, USA)

Anne Schmitz (Gannon University, USA)

Kurt Hersch (Gannon University, USA)

F2A: Special Session: Considering students' intrinsic motivations and positive emotions in course design: Are they ends, means, or threats?

1:30 PM - 3:00 PM

Room: 170A

***CONSIDERING STUDENTS' INTRINSIC MOTIVATIONS AND POSITIVE EMOTIONS
IN COURSE DESIGN: ARE THEY ENDS, MEANS, OR THREATS?***

Jonathan D. Stolk (Franklin W. Olin College of Engineering, USA)

Yevgeniya V. Zastavker (Franklin W. Olin College of Engineering, USA)

Alex Dillon (Franklin W. Olin College of Engineering, USA)

Michael D. Gross (Wake Forest University, USA)

F2B: Special Session: Open Sourcing Education for Data Engineering and Data Science

1:30 PM - 3:00 PM

Room: 170B

OPEN SOURCING EDUCATION FOR DATA ENGINEERING AND DATA SCIENCE

David E Drummond (Insight Data Engineering, USA)

F2C: Faculty Development: Careers

Chair: Divya Nalla (Nalla Malla Reddy Engineering College, India)

1:30 PM - 3:00 PM

Room: 130B

***ASIAN-AMERICAN WOMEN ENGINEERING FACULTY: A LITERATURE REVIEW USING AN
INTERSECTIONAL FRAMEWORK OF RACE, CLASS, AND GENDER***

Nikitha Sambamurthy (Purdue University, USA)

Joyce B. Main (Purdue University, USA)

Matilde Sánchez-Peña (Purdue University, USA)

Monica F. Cox (The Ohio State University, USA)

Ebony McGee (Vanderbilt University, USA)

***THE FACTORS AFFECTING THE PERSISTENCE OF LATINA FACULTY: A LITERATURE REVIEW
USING THE INTERSECTIONALITY OF RACE, GENDER, AND CLASS***

Matilde Sánchez-Peña (Purdue University, USA)

Joyce Main (Purdue University, USA)

Nikitha Sambamurthy (Purdue University, USA)

Monica Cox (The Ohio State University, USA)

Ebony McGee (Vanderbilt University, USA)

THE CAREER GOALS OF NON-TENURE-TRACK FULL-TIME ENGINEERING FACULTY

Cliff Fitzmorris (University of Oklahoma, USA)

Randa Shehab (University of Oklahoma, USA)

Deborah Trytten (University of Oklahoma, USA)

***TEACHING PATHWAYS IN THE ACADEMY: A NARRATIVE STUDY OF ENGINEERING
FACULTY AT INSTITUTIONS WITH VARYING TEACHING AND RESEARCH ACTIVITY***

Natascha M. Trellinger (Purdue University, USA)

Brent K. Jesiek (Purdue University, USA)

***PERCEPTIONS OF TREATMENT FOR UNDERREPRESENTED
MINORITY FACULTY IN ENGINEERING***

Juan M. Cruz (Virginia Tech, USA)

Indhira M. Hasbún (Virginia Tech, USA)

Stephanie G. Adams (Virginia Tech, USA)

Joan M. Banks-Hunt (Virginia Tech, USA)

Gilda A. Barabino (CUNV City College, USA)

F2D: Diversity: Intersectionality**Chair:** Javier A. Kypuros (The University of Texas Rio Grande Valley, USA)**1:30 PM - 3:00 PM****Room:** 130C

***ENGINEERING COMPETITION TEAM RECRUITMENT AND INTEGRATION STRATEGIES
IMPACT ON TEAM DIVERSITY***

Deborah A. Trytten (University of Oklahoma, USA)

Ryan Browning (University of Oklahoma, USA)

Catherine Thomas (University of Oklahoma, USA)

Cindy Foor (University of Oklahoma, USA)

Randa Shehab (University of Oklahoma, USA)

Susan Walden (University of Oklahoma, USA)

Celia Pan (Toyota Financial Services, USA)

***REPRESENTATIONS OF UNDERREPRESENTED CHARACTERS
IN ENGINEERING CHILDREN BOOKS***

Hoda Ehsan (Purdue University, USA)

Xinrui (Rose) Xu (Purdue University, USA)

Monica Cardella (Purdue University, USA)

***ANALYSIS OF MULTI-MODAL SPATIAL VISUALIZATION WORKSHOP INTERVENTION ACROSS
GENDER, NATIONALITY, AND OTHER ENGINEERING STUDENT DEMOGRAPHICS***

Jacob L. Segil (University of Colorado at Boulder, USA)

Jacquelyn F. Sullivan (University of Colorado Boulder, USA)

Beth A. Myers (University of Colorado Boulder, USA)

Derek T. Reamon (University of Colorado Boulder, USA)

Marissa H. Forbes (University of Colorado Boulder, USA)

***SUPPORTING ECONOMICALLY DISADVANTAGED STUDENTS
FROM NICARAGUA IN STEM-C FIELDS***

Iva Bojic (Singapore-MIT Alliance for Research and Technology, Singapore)

Juan F. Arratia (Ana G. Méndez University System, USA)

Vedran Podobnik (University of Zagreb, Croatia)

Mislav Grgic (University of Zagreb, Croatia)

INVESTIGATING THE IMPACT OF A HYBRID SUMMER TRANSITION PROGRAM

Lauren Griggs (Virginia Commonwealth University, USA)

Falcon Rankins (Virginia Commonwealth University, USA)

JK Stringer (Virginia Commonwealth University, USA)

Rosalyn Hargraves (Virginia Commonwealth University, USA)

F2E: PK-12: Teacher Development**Chair:** Aaron Johnson (Tufts University, USA)**1:30 PM - 3:00 PM****Room:** 140A

***TRAINING TEACHERS TO INTEGRATE ENGINEERING INTO NON-TECHNICAL
MIDDLE SCHOOL CURRICULUM***

Emily Hamner (Carnegie Mellon University, USA)

Jennifer Cross (Carnegie Mellon University, USA)

Lauren Zito (Carnegie Mellon University, USA)

Debra Bernstein (TERC, USA)

Karen Mutch-Jones (TERC, USA)

RESEARCH MODELS WITH DISSEMINATION ACTIVITIES FOR RESEARCH EXPERIENCE FOR TEACHERS (RET)

Mangilal Agarwal (Indiana University-Purdue University Indianapolis, USA)
Brandon Sorge (Indiana University-Purdue University Indianapolis, USA)
Grant Fore (Indiana University-Purdue University Indianapolis, USA)
Dan Minner (Indiana University-Purdue University Indianapolis, USA)
Charles Feldhaus (Indiana University-Purdue University Indianapolis, USA)
Maher Rizkalla (Indiana University-Purdue University Indianapolis, USA)

ENGAGING K-12 TEACHERS IN ENGINEERING THROUGH A PROFESSIONAL DEVELOPMENT PROGRAM: IMPLEMENTATION STRATEGIES, RESULTS AND LESSONS LEARNED

Mounir Ben Ghalia (The University of Texas Rio Grande Valley, USA)
Ralph Carlson (The University of Texas Rio Grande Valley, USA)
Veronica Estrada (The University of Texas Rio Grande Valley, USA)
Hasina Huq (The University of Texas Rio Grande Valley, USA)
Jaime Ramos (The University of Texas Rio Grande Valley, USA)

K-12 STEM EDUCATION: BRINGING THE ENGINEERING MAKER SPACE, STUDENT-CENTERED LEARNING, CURRICULUM, AND TEACHER TRAINING TO MIDDLE SCHOOLS

Joan M. Banks-Hunt (Virginia Tech University, USA)
Stephanie Adams (Virginia Tech University, USA)
Susan Ganter (Virginia Tech University, USA)
Juan Cruz Bohorquez (Virginia Tech University, USA)

AN EXPERIENTIAL APPROACH TO UNDERSTANDING THE ENGINEERING DESIGN PROCESS

Sarah Gray (University of San Diego, USA)
Maaron Tesfaye (University of San Diego, USA)
Rishika Daryanani (University of San Diego, USA)
Odesma Dalrymple (University of San Diego, USA)
Susan Lord (University of San Diego, USA)

F2F: Advanced Computer Science Courses

Chair: Eric Durant (Milwaukee School of Engineering, USA)

1:30 PM - 3:00 PM

Room: 140B

TEACHING MOBILE APPLICATION DEVELOPMENT THROUGH LECTURES, INTERACTIVE TUTORIALS, AND PAIR PROGRAMMING

Mohammed Seyam (Virginia Tech, USA)
D. Scott McCrickard (Virginia Tech, USA)
Shuo Niu (Virginia Tech, USA)
Andrey Esakia (Virginia Tech, USA)
Woongsup Kim (Dongguk University, Korea)

TEACHING GENETIC ALGORITHM-BASED PARAMETER OPTIMIZATION USING PACMAN

Carlos N. Silla Jr. (Pontifical Catholic University of Paraná, Brazil)

USE OF MODEL-BASED DESIGN TO TEACH EMBEDDED SYSTEMS PROGRAMMING

Nannan He (Minnesota State University at Mankato, USA)
Han-way Huang (Minnesota State University at Mankato, USA)

IMMEDIATE FEEDBACK TOOL IN TEACHING DATABASE AND ITS CONTRIBUTION TO THE LEARNING OF STUDENTS ON COMPUTER SCIENCE COURSE

Monael Pinheiro Ribeiro (Federal University of ABC, Brazil)
Gabriel Paulon (Federal University of ABC, Brazil)
Adriana Keiko Nishida (Federal University of ABC, Brazil)

***TEACHING-LEARNING FIREWALL CONFIGURATION USING A VISUAL MODELING WEB BASED TOOL:
THE SP2MODEL AND ITS APPLICATION TO COMPUTER SCIENCE COURSE***

Helton Molina Sapia (Universidade Estadual Paulista “Júlio de Mesquita Filho”, Brazil)
Rogério Eduardo Garcia (Universidade Estadual Paulista “Júlio de Mesquita Filho”, Brazil)
Celso Olivete Júnior (Universidade Estadual Paulista “Júlio de Mesquita Filho”, Brazil)
Danillo Roberto Pereira (Universidade Estadual Paulista “Júlio de Mesquita Filho”, Brazil)
Kleber Manrique Trevisani (Instituto Federal de Educação Ciência e Tecnologia de São Paulo, Brazil)

F2G: Mobile Devise Enabled Learning

Chair: Yi Wu (Penn State Erie, the Behrend College, USA)

1:30 PM - 3:00 PM

Room: 140C

AN ANDROID APP FOR SPATIAL ACOUSTIC ANALYSIS AS A LEARNING TOOL

Thomas H. DePue (Clarkson University, USA)
Benjamin Robistow (Clarkson University, USA)
Robert Newman (Clarkson University, USA)
Kevin Mack (Clarkson University, USA)
Mahesh K. Banavar (Clarkson University, USA)
Tianqi Yang (Clarkson University, USA)
Dana Barry (Clarkson University, USA)
Paul Curtis (Arizona State University, USA)
Andreas Spanias (Arizona State University, USA)
Whitni Watkins (Systems Librarian, USA)

***CONTINUANCE USE INTENTION OF PRIMARY SCHOOL LEARNERS TOWARDS MOBILE
MATHEMATICAL APPLICATIONS***

Marisa Venter (Central University of Technology, South Africa)
Lizette de Wet (University of the Free State, South Africa)

QUALITY EVALUATION OF MOBILE LEARNING APPLICATIONS

Gustavo Willians Soad (University of São Paulo (USP), Brazil)
Nemesio F. Duarte Filho (Federal Institute of São Paulo (IFSP), Brazil)
Ellen Francine Barbosa (University of São Paulo (USP), Brazil)

***DISCOVERING STUDENTS MOBILE LEARNING EXPERIENCES
IN HIGHER EDUCATION IN NIGERIA***

Solomon S. Oyelere (University of Eastern Finland, Finland)
Jarkko Suhonen (University of Eastern Finland, Finland)
Shaibu A. Shonola (University of Warwick, United Kingdom)
Mike S. Joy (University of Warwick, United Kingdom)

***DEVELOPMENT OF A MOBILE-FRIENDLY CLASSROOM SUPPORT SYSTEM TO IMPROVE STUDENTS'
PRESENTATION SKILLS***

Junko Toyoshima (Hosei University, Japan)
Soichiro Fujii (Hosei University, Japan)
Yuji Tokiwa (Hosei University, Japan)

F2H: Professional Skills Development

Chair: Benjamin Ahn (Iowa State University, USA)

1:30 PM – 3:00 PM

Room: 160A

***AN EFFECTIVE DESIGN COURSE TO INSPIRE ACTIVE LEARNING IN
UNDERGRADUATE EDUCATION***

Salem Elsaiah (Bucknell University, USA)
Peter Mark Jansson (Bucknell University, USA)

IMPLEMENTING LEAN LAUNCHPAD METHODOLOGY INTO AN ENGINEERING PROFESSIONAL DEVELOPMENT COURSE

Chad E. Davis (University of Oklahoma, USA)
Ronald E. Bolen (University of Oklahoma, USA)

***DETERMINING PROGRESS IN WRITING COMPETENCY
BY ASSESSING STUDENTS' ARGUMENTATION***

Sofia Cassel (Uppsala University, Sweden)
Aletta Nylén (Uppsala University, Sweden)

***ENGINEERING REPORT: A TOOL TO FACILITATE LEARNING
FOR REAL-WORLD PROBLEM SOLVING***

Jia-Ling Lin (University of Minnesota Twin Cities, USA)
Paul Imbertson (University of Minnesota Twin Cities, USA)
Kundan Srivastav (University of Minnesota Twin Cities, USA)
William Horn (University of Minnesota Twin Cities, USA)

CONTINUOUS LEARNING THROUGH INLINE TRAINING

Brian Krisler (Raytheon BBN Technologies, USA)
Richard Alterman (Brandeis University, USA)

F2I: Non-Traditional Student Pathways

Chair: Nathan Canney (Seattle University, USA)

1:30 PM - 3:00 PM

Room: 160B

ENTRY PATHWAYS, ACADEMIC PERFORMANCE, AND PERSISTENCE OF NONTRADITIONAL STUDENTS IN ENGINEERING BY TRANSFER STATUS

Jacqueline C. McNeil (University of Louisville, USA)
Matthew W. Ohland (Purdue University, USA)
Russell A. Long (Purdue University, USA)

FORMATIVE EVALUATION OF AN INNOVATIVE PROGRAM TO PREPARE NON-TECHNICAL MAJORS TO JOIN ADVANCED MANUFACTURING WORKFORCE

Abe Zeid (Northeastern University, USA)
Claire Duggan (Northeastern University, USA)
Marina Bogard (MassBay Community College, USA)
Chitra Javdekar (MassBay Community College, USA)

EXPLORING THE INTERSECTION OF VETERAN STATUS, AGE, AND ENGINEERING STUDY

Catherine E. Brawner (Research Triangle Educational Consultants, USA)
Catherine Mobley (Clemson University, USA)
Joyce Main (Purdue University, USA)
Michelle M. Camacho (University of San Diego, USA)
Susan M. Lord (University of San Diego, USA)

***A STEM PROGRAM FOCUSED ON TRANSFER STUDENT SUCCESS
AT BINGHAMTON UNIVERSITY***

Eric Cotts (Binghamton University, USA)
Jiye Fang (Binghamton University, USA)
Wayne Jones (Binghamton University, USA)
David Klotzkin (Binghamton University, USA)
Greta Myers (Binghamton University, USA)
Bruce White (Binghamton University, USA)

F2J: Philosophy of Engineering and Engineering Education

Chair: Nicole Pitterson (Oregon State University, USA)

1:30 PM - 3:00 PM

Room: 160C

***MORE BY LUCK THAN GOOD JUDGEMENT: MORAL PURPOSE IN ENGINEERING EDUCATION
POLICY MAKING FOR CHANGE***

John Heywood (Trinity College Dublin, Ireland)

FRONTIERS IN EDUCATION-HAVE WE MADE A DIFFERENCE? IF SO, WHAT?

Edwin C. Jones, Jr (Iowa State University, USA)

James R. Rowland (University of Kansas, USA)

***STATE OF MIXED METHODS RESEARCH IN ENGINEERING EDUCATION:
IN-DEPTH EXAMINATION OF JEE ARTICLES, 2010-2015***

Neha Choudhary (Purdue University, USA)

Brent K. Jesiek (Purdue University, USA)

BALANCING ENGINEERING AND RELIGIOUS IDENTITY

Kelly J. Cross (University of Illinois Urbana Champaign, USA)

ISSUES IN STUDENT VALUING OF SOFTWARE ENGINEERING BEST PRACTICES

Stephen T. Frezza (Gannon University, USA)

F3A: Special Session: Developing ABET Criteria for Undergraduate Cybersecurity Programs

4:00 PM - 5:30 PM

Room: 170A

DEVELOPING ABET CRITERIA FOR UNDERGRADUATE CYBERSECURITY PROGRAMS

Allen Parrish (The United States Naval Academy, USA)

Edward Sobiesk (Army Cyber Institute, USA)

F3B: Special Session: Preparing Engineers for Careers in Social Innovation and Sustainable Development

4:00 PM - 5:30 PM

Room: 170B

***PREPARING ENGINEERS FOR CAREERS IN SOCIAL INNOVATION
AND SUSTAINABLE DEVELOPMENT***

Khanjan Mehta (The Pennsylvania State University, USA)

Irena Gorski (The Pennsylvania State University, USA)

F3C: Faculty Development: Culture and Practices

Chair: Ella L. Ingram (Rose-Hulman Institute of Technology, USA)

4:00 PM - 5:30 PM

Room: 130B

***DO DIFFERENCES EXIST BETWEEN HOW ENGINEERING AND NON-ENGINEERING LECTURERS
PERCEIVE THE IMPORTANCE OF TEACHING COMPETENCES?***

Antoni Perez-Poch (Universitat Politècnica de Catalunya - BarcelonaTech, Spain)

David López (Universitat Politècnica de Catalunya - BarcelonaTech, Spain)

***RESEARCH CULTURE IN ENGINEERING FACULTY: ITS EFFECT ON THE ATTAINMENT
OF GRADUATE ATTRIBUTES***

Divya Nalla (Nalla Malla Reddy Engineering College, India)

Sneha Nalla (Nalla Malla Reddy Engineering College, India)

STUDYING FACULTY COMMUNITIES OF PRACTICE THROUGH SOCIAL NETWORK ANALYSIS

Shufeng Ma (University of Illinois at Urbana-Champaign, USA)
Geoffrey L. Herman (University of Illinois at Urbana-Champaign, USA)
Matthew West (University of Illinois at Urbana-Champaign, USA)
Jonathan Tomkin (University of Illinois at Urbana-Champaign, USA)
Jose Mestre (University of Illinois at Urbana-Champaign, USA)

USING REFLECTION TO IDENTIFY DISSONANCE, CONSONANCE, AND INTEREST IN TEACHING: COMPARING DEFINITIONS AND STORIES TO RESOLVE CONFLICT

Anne LoVerso (Franklin W. Olin College of Engineering, USA)
Adam Coppola (Franklin W. Olin College of Engineering, USA)
Emma Price (Franklin W. Olin College of Engineering, USA)
Gwyneth Phelps (Franklin W. Olin College of Engineering, USA)
Yevgeniya V. Zastavker (Franklin W. Olin College of Engineering, USA)
Jeremy M. Goodman (Franklin W. Olin College of Engineering, USA)

F3D: Diversity and Inclusivity Awareness

Chair: Kelly Cross (University of Illinois Urbana Champaign, USA)

4:00 PM – 5:30 PM

Room: 130C

PARTICIPATORY DESIGN FOR THE DEVELOPMENT OF INCLUSIVE EDUCATIONAL TECHNOLOGIES: A SYSTEMATIC REVIEW

Luciana C. L. F. Borges (Universidade Federal de Mato Grosso, Brazil)
Mauricio R. R. Araujo (Universidade Federal de Mato Grosso, Brazil)
Cristiano Maciel (Universidade Federal de Mato Grosso, Brazil)
Eunice P. S. Nunes (Universidade Federal de Mato Grosso, Brazil)

DEVELOPING DIVERSITY AWARENESS OF SOFTWARE ENGINEERS: A DIVERSITY FRAMEWORK AND ITS APPLICATION IN AN ACADEMIC AND LIFE-LONG LEARNING CONTEXT

Christina Böhm (University of Vienna, Austria)
Renate Motschnig (University of Vienna, Austria)

EXPLORING STUDENT MOTIVATION TOWARDS DIVERSITY EDUCATION IN ENGINEERING

Sarah A. Williams (Virginia Tech, USA)
Ben Lutz (Virginia Tech, USA)
Cynthia Hampton (Virginia Tech, USA)
Holly M. Matusovich (Virginia Tech, USA)
Walter C. Lee (Virginia Tech, USA)

AUTISM SPECTRUM DISORDER AND ENGINEERING EDUCATION – NEEDS AND CONSIDERATIONS

Mary Pilotte (Purdue University, USA)
Diana Bairaktarova (Virginia Tech, USA)

INTEGRATED CRAYONS FOR ADAPTIVE NEEDS

Nancy Morris (Gannon University, USA)
Davide Piovesan (Gannon University, USA)

F3E: PK-12: Teaching Computer-Related Topics

Chair: Courtney J Faber (The College of New Jersey, USA)

4:00 PM – 5:30 PM

Room: 130C

APPLYING SCRUM PROJECT MANAGEMENT IN ECE CURRICULUM

Robert B. Bass (Portland State University, USA)

Branimir Pejcinovic (Portland State University, USA)

John Grant (Portland State University, USA)

"CODE YOURSELF" AND "A PROGRAMAR": A BILINGUAL MOOC FOR TEACHING COMPUTER SCIENCE TO TEENAGERS

Inés Friss de Kereki (Universidad ORT Uruguay, Uruguay)

Areti Manatakis (University of Edinburgh, United Kingdom)

ARTIFICIAL INTELLIGENCE AND COMPUTER SCIENCE IN EDUCATION: FROM KINDERGARTEN TO UNIVERSITY

Martin Kandlhofer (Graz University of Technology, Austria)

Gerald Steinbauer (Graz University of Technology, Austria)

Sabine Hirschmugl-Gaisch (University of Teacher Education Styria, Austria)

Petra Huber (Children's Office Graz, Austria)

TEXTUAL VS. VISUAL PROGRAMMING LANGUAGES IN PROGRAMMING EDUCATION FOR PRIMARY SCHOOLCHILDREN

Hidekuni Tsukamoto (Osaka University of Arts, Japan)

Yasuhiro Takemura (Osaka University of Arts, Japan)

Yasumasa Oomori (Joetsu University of Education, Japan)

Isamu Ikeda (Institute of Information Education Support, Japan)

Hideo Nagumo (Niigata Seiryō University, Japan)

Akito Monden (Okayama University, Japan)

Ken-ichi Matsumoto (Nara Institute of Science and Technology, Japan)

COMPETENCY BASED IT EXPERIENCES

Chengcheng Li (University of Cincinnati, USA)

Hazem Said (University of Cincinnati, USA)

Rebekah Michael (University of Cincinnati, USA)

Marcus Johnson (University of Cincinnati, USA)

Helen Meyer (University of Cincinnati, USA)

F3F: Upper Division Computer Science

Chair: Tony Clear (Auckland University of Technology, New Zealand)

4:00 PM – 5:30 PM

Room: 140B

THE APTNESS OF TANGIBLE USER INTERFACES FOR EXPLAINING ABSTRACT COMPUTER NETWORK PRINCIPLES

Clifford De Raffaele (Middlesex University Malta, Malta)

Serengul Smith (Middlesex University, United Kingdom)

Orhan Gemikonakli (Middlesex University, United Kingdom)

COMBINED METHODOLOGY FOR THEORETICAL COMPUTING

Gabriel Spadon de Souza (Universidade de São Paulo (USP), Brazil)

Pedro Henrique de Andrade Gomes (Universidade Estadual Paulista (UNESP), Brazil)

Ronaldo Celso Messias Correia (Universidade Estadual Paulista (UNESP), Brazil)

Celso Olivete Júnior (Universidade Estadual Paulista (UNESP), Brazil)

Daniilo Medeiros Eler (Universidade Estadual Paulista (UNESP), Brazil)

Rogério Eduardo Garcia (Universidade Estadual Paulista (UNESP), Brazil)

***ANALYSIS OF STUDENTS' BEHAVIOR IN THE PROCESS
OF OPERATING SYSTEM EXPERIMENTS***

Lei Wang (Beihang University, P.R. China)
Chao Gao (Beihang University, P.R. China)
Tianyu Wo (Beihang University, P.R. China)
Bin Shi (Beihang University, P.R. China)

***A TEAM-APPROACH TO PUTTING LEARNER-CENTERED PRINCIPLES TO PRACTICE IN A LARGE
COURSE ON HUMAN-COMPUTER INTERACTION***

Renate Motschnig (University of Vienna, Austria)
Michael Sedlmair (University of Vienna, Austria)
Svenja Schröder (University of Vienna, Austria)
Torsten Möller (University of Vienna, Austria)

***JOTHELLOT: A JAVA-BASED OPEN SOURCE OTHELLO FRAMEWORK
FOR ARTIFICIAL INTELLIGENCE UNDERGRADUATE CLASSES***

Carlos N. Silla Jr. Pontifical Catholic University of Paraná (PUCPR), Brazil
Marcelo Paglione (Federal University of Technology of Paraná (UTFPR), Brazil)
Iuri G.P. Mardegan (Federal University of Technology of Paraná (UTFPR), Brazil)

F3G: Remote Laboratories

Chair: Glen Archer (Michigan Technological University, USA)

4:00 PM – 5:30 PM

Room: 140C

***ADOPTING AN EXERCISE PROGRAM FOR ELECTRONICS ENGINEERING EDUCATION UTILISING
REMOTE LABORATORIES FOR THE AGE OF MOOC***

Dag A. H. Samuelsen (University College of Southeast Norway, Norway)
Olaf H. Graven (University College of Southeast Norway, Norway)

***LABSLAND: A SHARING ECONOMY PLATFORM TO PROMOTE EDUCATIONAL REMOTE
LABORATORIES MAINTAINABILITY, SUSTAINABILITY AND ADOPTION***

Pablo Orduña (DeustoTech - Deusto Institute of Technology, Spain)
Luis Rodriguez-Gil (DeustoTech - Deusto Institute of Technology, Spain)
Javier Garcia-Zubia (University of Deusto, Spain)
Ignacio Angulo (DeustoTech - Deusto Institute of Technology, Spain)
Unai Hernández (DeustoTech - Deusto Institute of Technology, Spain)
Esteban Azcuénaga (LabsLand, Spain)

***HANDS-ON AND VIRTUAL LABORATORIES TO UNDERGRADUATE CHEMISTRY EDUCATION:
TOWARD A PEDAGOGICAL INTEGRATION***

Saulo Ramos (ABC Federal University, Brazil)
Edson P. Pimentel (ABC Federal University, Brazil)
Maria das Graças B. Marietto (ABC Federal University, Brazil)
Wagner T. Botelho (ABC Federal University, Brazil)

DESIGN OF A LATIN AMERICAN AND CARIBBEAN REMOTE LABORATORIES NETWORK

Luis Felipe Zapata Rivera (Florida Atlantic University, USA)
Maria M. Larrondo-Petrie (Florida Atlantic University, USA)

***HYBRID TEACHING MODE FOR LABORATORY-BASED REMOTE EDUCATION OF COMPUTER
STRUCTURE COURSE***

Han Wan (Beihang University, P.R. China)
Xiaopeng Gao (Beihang University, P.R. China)
Qian Liu (Beihang University, P.R. China)

F3H: Engineering Education Research**Chair:** Cem Sahin (Drexel University, USA)**4:00 PM – 5:30 PM****Room:** 160A

GRIT AND FIRST-YEAR RETENTION IN ENGINEERING

Dong San Choi (University of Illinois at Urbana-Champaign, USA)

Beth Ann Myers (University of Colorado Boulder, USA)

Michael C. Loui (Purdue University, USA)

MASTERY GRADING OF ENGINEERING HOMEWORK ASSIGNMENTS

Jacob Moore (Penn State University, USA)

DEVELOPING A GROUNDED THEORY OF UNDERGRADUATE CIVIL ENGINEERING PROFESSIONAL IDENTITY FORMATION

Cassandra Groen (Virginia Tech, USA)

Lisa D. McNair (Virginia Tech, USA)

EXPLORING SHAME IN ENGINEERING EDUCATION

James L. Huff (Harding University, USA)

Jeremiah Sullins (Harding University, USA)

Nicola W. Sochacka (University of Georgia, USA)

Kathryn M. Youngblood (University of Georgia, USA)

Kerby M. Wood (University of Georgia, USA)

Shari E. Miller (University of Georgia, USA)

Joachim Walther (University of Georgia, USA)

PHYSIOLOGICAL SENSING BASED STRESS ANALYSIS DURING ASSESSMENT

Aniruddha Sinha (Tata Consultancy Services Ltd., India)

Pratyusha Das (Tata Consultancy Services Ltd., India)

Rahul Gavas (Tata Consultancy Services Ltd., India)

Debatree Chatterjee (Tata Consultancy Services Ltd., India)

Sanjoy Saha (Jadavpur University, India)

F3I: Engineering Discipline Specific**Chair:** Yong-Kyu Jung (Gannon University, USA)**4:00 PM – 5:30 PM****Room:** 160B

TEACHING MODERN CONTROL THEORY TO UNDERGRADUATES USING A STATE SPACE MODEL OF A SYNCHRONOUS GENERATOR

Mohammad Rasouli (Penn State Erie, USA)

Robert Weissbach (Penn State Erie, USA)

Deryck Yeung (Penn State Erie, USA)

TEACHING THE FOUNDATIONS OF THERMODYNAMICS WITH PYRO

Christopher R. Martin (Penn State University, USA)

Jacob P. Moore (Penn State University, USA)

Joseph A. Ranalli (Penn State University, USA)

FILLING THE SKILLS GAP IN U.S. MANUFACTURING: PROMOTING INTERNSHIP AND CO-OP EXPERIENCES AND INTEGRATING INDUSTRIAL ENGINEERING COURSES TO IMPROVE STUDENT DESIGN AND MANUFACTURING KNOWLEDGE

Paul Lynch (Penn State Behrend, USA)

Faisal Aqlan (Penn State Behrend, USA)

***DEVELOPING A SYSTEMATIC FRAMEWORK
TO ENHANCE CONSTRUCTION PROCEDURE DESIGN***

Ali Shafaat (Purdue University, USA)
Hossein Ebrahimejad (Purdue University, USA)
Farshid Marbouti (San Jose State University, USA)
Monica Cardella (Purdue University, USA)
Amr Kandil (Purdue University, USA)

F3J: Problem Solving

Chair: Axel Böttcher (Munich University of Applied Sciences, Germany)

4:00 PM – 5:30 PM

Room: 160C

***DEVELOPING MORE ROBUST PROBLEM SOLVERS
THROUGH DIVERSITY OF COURSE EXPERIENCES***

Elif E. Miskioğlu (Bucknell University, USA)

EXPLORING THE ROLE OF SPATIAL COGNITION IN PROBLEM SOLVING

Gavin Duffy (Dublin Institute of Technology, Ireland)
Sheryl Sorby (Ohio State University, USA)
Steven Nozaki (Ohio State University, USA)
Brian Bowe (Dublin Institute of Technology, Ireland)

***ABSTRACTION AND PROBLEM SOLVING IN AN UNDERGRADUATE ELECTRICAL ENGINEERING
CIRCUITS COURSE***

Presentacion Rivera-Reyes (University of Nebraska-Lincoln, USA)
Lance C. Pérez (University of Nebraska-Lincoln, USA)

***THINKING ABOUT ASKING: ENCOURAGING A QUESTIONING APPROACH TO REQUIREMENTS
GATHERING AND PROBLEM SOLVING***

Madalene Spezialetti (Trinity College, USA)

Saturday, October 15

SIA: Special Session: Culturally Responsive Practices in K-16 Engineering Education

8:30 AM - 10:00 AM

Room: 170A

***SPECIAL SESSION: CULTURALLY RESPONSIVE PRACTICES
IN K-16 ENGINEERING EDUCATION***

Renata A. Revelo (University of Illinois at Chicago, USA)

Joel Alejandro Mejia (Angelo State University, USA)

Marlon Mitchell (University of Illinois at Urbana-Champaign, USA)

SIB: Peer Teaching and Learning

Chair: Kassim Tarhini (United States Coast Guard Academy, USA)

8:30 AM - 10:00 AM

Room: 170B

***AN EXPERIMENT WITH SEPARATE FORMATIVE AND SUMMATIVE RUBRICS
IN EDUCATIONAL PEER ASSESSMENT***

Yang Song (NC State University, USA)

Zhewei Hu (NC State University, USA)

Yifan Guo (NC State University, USA)

Edward F. Gehringer (NC State University, USA)

***"TEACHING IS LEARNING": PEDAGOGICAL MATERIAL
CREATED AND EVALUATED BY STUDENTS***

Jérémy Barbay (University of Chile, Chile)

Jocelyn Simmonds (University of Chile, Chile)

Adriana Keiko Nishida (Federal University of ABC, Brazil)

Monael Pinheiro Ribeiro (Federal University of ABC, Brazil)

PEER GRADING EXAMS WITH VIDEO RUBRICS

Shawn Lupoli (University of Maryland, Baltimore County, USA)

***A MARKUP LANGUAGE FOR BUILDING A DATA WAREHOUSE
FOR EDUCATIONAL PEER-ASSESSMENT RESEARCH***

Yang Song (North Carolina State University, USA)

Ferry Pramudianto (North Carolina State University, USA)

Edward F Gehringer (North Carolina State University, USA)

LEARNING WITH INTERACTIVE TABLETOP DISPLAYS

Shuo Niu (Virginia Tech, USA)

D. Scott McCrickard (Virginia Tech, USA)

Sophia M. Nguyen (Virginia Tech, USA)

SIC: First and Second Year Programs

Chair: Mark A. Holliday (Western Carolina University, USA)

8:30 AM - 10:00 AM

Room: 130B

***HOW IMPORTANT IS HIGH-SCHOOL COMPUTING EXPERIENCE
FOR FIRST-YEAR ENGINEERING STUDENT SUCCESS?***

Amber Kempainen (Michigan Technological University, USA)

Mary Fraley (Michigan Technological University, USA)

Amy Hamlin (Michigan Technological University, USA)

Gretchen Hein (Michigan Technological University, USA)

TARGETED FLIPPED CLASSROOM TECHNIQUE APPLIED TO A CHALLENGING TOPIC

Joseph Ranalli (Penn State Hazleton, USA)
Jacob Moore (Penn State Mont Alto, USA)

**ASSESSMENT OF CLOUD-BASED COMPUTATIONAL ENVIRONMENTS
FOR HIGHER EDUCATION**

J. Damian Segrelles (Universitat Politècnica de València, Spain)
Germán Moltó (Universitat Politècnica de València, Spain)

**DESIGN OF OPEN SOURCE PLATFORM FOR AUTOMATIC CONTROL SYSTEMS EDUCATION
BASED ON COOPERATIVE LEARNING**

Jonathan Alvarez Ariza (Uniminuto, Colombia)

**USING DESIGN JOURNALS TO UNCOVER INFORMATION LITERACY HABITS
OF FIRST-YEAR STUDENTS**

Michael Fosmire (Purdue University, USA)
Nastasha Johnson (Purdue University, USA)
Nathan Mentzer (Purdue University, USA)

SID: Inclusivity and Diversity Initiatives

Chair: Rebekah Michael (University of Cincinnati, USA)

8:30 AM - 10:00 AM

Room: 130C

**METHODOLOGY FOR INNOVATION IN THE EDUCATION OF FUTURE ENGINEERS WITH
TECHNOLOGICAL AND SOCIAL AWARENESS**

D. Arias (Pontificia Universidad Catolica del Peru, Peru)
D. Quiroz (Pontificia Universidad Catolica del Peru, Peru)
D. Elias (Pontificia Universidad Catolica del Peru, Peru)

**MOTIVATING ATTENDEE'S PARTICIPATION IN DISTANCE LEARNING VIA AN AUTOMATIC
MESSAGING PLUGIN FOR THE MOODLE PLATFORM**

Luciano R. de Almeida (University of Brasília, Brazil)
Joao Paulo C. L. da Costa (University of Brasília, Brazil)
Rafael T. de Sousa Junior (University of Brasília, Brazil)
Edison P. de Freitas (Federal University of Rio Grande do Sul, Brazil)
Edna D. Canedo (University of Brasília, Brazil)
Juliano Pretz (Universidade de Brasília, Brazil)
Eliakim Zacarias (Universidade de Brasília, Brazil)
Giovanni Del Galdo (Ilmenau University of Technology, Germany)

**INTERDISCIPLINARY SYSTEMS ENGINEERING AND AERONAUTICS SCIENCE EFFORT
TO ENHANCE SUAS TRAINING PROGRAM FOR UNDERGRADUATE STUDENTS**

Luis Daniel Otero (Florida Institute of Technology, USA)
Nicholas Gagliardo (Florida Institute of Technology, USA)
Dennis Dalli (Florida Institute of Technology, USA)
Julie Moore (Florida Institute of Technology, USA)

**INSTRUCTIONAL DESIGN PRINCIPLES OF DIVERSITY-FOCUSED PROFESSIONAL DEVELOPMENT
MOOC FOR COMMUNITY COLLEGE COMPUTING FACULTY: LIGHTHOUSE CC**

Yunjeong Chang (University of Virginia, USA)
Leslie Cintron (University of Virginia, USA)
Joanne Cohoon (University of Virginia, USA)
James Cohoon (University of Virginia, USA)
Luther Tychonievich (University of Virginia, USA)

MINORITY MERIT: IMPROVING RETENTION WITH COOPERATIVE LEARNING IN A FIRST-YEAR ELECTRONICS COURSE

Serge Minin (University of Illinois at Urbana-Champaign, USA)
David Varodayan (University of Illinois at Urbana-Champaign, USA)
Christopher Schmitz (University of Illinois at Urbana-Champaign, USA)
Brian Faulkner (University of Illinois at Urbana-Champaign)
Dong San Choi (University of Illinois at Urbana-Champaign, USA)
Geoffrey L. Herman (University of Illinois at Urbana-Champaign, USA)

SIE: Collaborative Teaching and Learning

Chair: Kurt Thoroughman (Washington University in St. Louis, USA)

8:30 AM - 10:00 AM

Room: 140A

THE MICROGENETIC ANALYSIS OF STAGED PEER COLLABORATION FOR INTRODUCTORY PROGRAMMING

Maria Altebarmakian (Brandeis University, USA)
Richard Alterman (Brandeis University, USA)
Anna Yatskar (Brandeis University, USA)
Kendall Harsch (Brandeis University, USA)
Antonella DiLillo (Brandeis University, USA)

MAKING THE CONNECTION: SUCCESSFUL CROSS CAMPUS COLLABORATION AMONG STUDENTS

Theresa M. Vitolo (Gannon University, USA)
Kurt E. Hersch (Gannon University, USA)
Barry J. Brinkman (Gannon University, USA)

WHO WANTS TO COLLABORATE? A STEP TOWARDS UNDERSTANDING COLLABORATION AS CHOICE

Matthew Bojey (University of British Columbia, Canada)
Bowen Hui (University of British Columbia, Canada)

COLLABORATIVE TEACHING: EXPLORING REFLECTIVE PRACTICE TO ADDRESS UNCERTAINTY AVOIDANCE

Lisa D. McNair (Virginia Tech, USA)
Liesl Baum (Virginia Tech, USA)
Najla Mouchrek (Virginia Tech, USA)

SOCIAL EPISTEMIC COGNITION AND ENGINEERING STUDENTS' COLLABORATIVE LEARNING IN EMERGING AREAS: AN IMPLEMENTATION CASE STUDY IN A COURSE FOR SOCIAL NETWORKING

Rosanna Yuen-Yan Chan (The Chinese University of Hong Kong, Hong Kong)

SIF: Programming in the First and Second Years

Chair: Jeong Yang (Texas A&M University-San Antonio, USA)

8:30 AM - 10:00 AM

Room: 140B

TEACHING PROGRAMMING IN THE CONTEXT OF SOLVING ENGINEERING PROBLEMS

Joseph P. Hoffbeck (University of Portland, USA)
Heather E. Dillon (University of Portland, USA)
Robert J. Albright (University of Portland, USA)
Wayne Lu (University of Portland, USA)
Timothy A. Doughty (University of Portland, USA)

COVERAGE OF CS1 PROGRAMMING CONCEPTS IN C++ AND JAVA TEXTBOOKS

Kirby McMaster (Weber State University, USA)
Brian Rague (Weber State University, USA)
Samuel Sambasivam (Azusa Pacific University, USA)
Stuart Wolthuis (Brigham Young University-Hawaii, USA)

AN APPROACH FOR THE USE OF LEARNING OBJECTS IN TEACHING COMPUTER PROGRAMMING CONCEPTS

Luiz Ricardo Begosso (Centro de Pesquisas em Informatica - Cepein, Brazil)
Luiz Carlos Begosso (Faculdade de Tecnologia de Assis, Brazil)
Raissa Helena Begosso (BS Tecnologia, Brazil)

SWITCHING TO BLEND-ED: EFFECTS OF REPLACING THE TEXTBOOK WITH THE BROWSER IN AN INTRODUCTORY COMPUTER PROGRAMMING COURSE

Patrick Seeling (Central Michigan University, USA)

VISUAL PROGRAMMING AND AUTOMATIC EVALUATION OF EXERCISES: AN EXPERIENCE WITH A STEM COURSE

Leônidas de Oliveira Brandão (University of São Paulo, Brazil)
Yorah Bosse (Federal Univ. of Mato Grosso do Sul, Brazil)
Marco Aurélio Gerosa (University of São Paulo, Brazil)

SIG: Makers, Making, and Makerspaces

Chair: Tom J. Zajdel (University of California, Berkeley, USA)

8:30 AM - 10:00 AM

Room: 140C

THE ROLE OF VIRTUAL OBJECTS IN PERFORMING ENGINEERING RELATED TASK

Diana Bairaktarova (Virginia Tech, USA)
Aditya Johri (George Mason University, USA)

EXAMINING TWO LEARNER APPROACHES IN A MAKING ACTIVITY WITH UNIVERSITY STUDENTS

Fayette Shaw (Tufts University, USA)
Kristen Wendell (Tufts University, USA)

EXPLORING TRADITIONAL AND WORKBENCH-STYLE KITS TO SUPPORT PROJECT- AND PROBLEM-BASED LEARNING

Zane Cochran (Georgia Institute of Technology, USA)
Betsy DiSalvo (Georgia Institute of Technology, USA)

SIH: Project-Based Learning

Chair: Qaiser Malik (National University of Sciences and Technology, Pakistan)

8:30 AM - 10:00 AM

Room: 160A

TEACHING TOUCH SENSING TECHNOLOGIES THROUGH PROJECT-BASED LEARNING

Nannan He (Minnesota State University at Mankato, USA)
Han-way Huang (Minnesota State University at Mankato, USA)
Ying Qian (Nanjing Institute of Technology, P.R. China)

MAINSTREAMING USABILITY IN LOWER LEVEL UNDERGRADUATE DESIGN COURSES

Allen H. Hoffman (Worcester Polytechnic Institute, USA)

INCORPORATING FEA IN AN UNDERGRADUATE BIOMECHANICS COURSE

Yi Wu (Pennsylvania State University Erie, the Behrend College, USA)
Amir Khalilollahi (Pennsylvania State University Erie, the Behrend College, USA)
Philip Martone (Pennsylvania State University Erie, the Behrend College, USA)

A CROSS-CURRICULAR APPROACH TO FOSTERING INNOVATION SUCH AS VIRTUAL REALITY DEVELOPMENT THROUGH STUDENT-LED PROJECTS

Sherri Harms (University of Nebraska at Kearney, USA)
John Hastings (University of Nebraska at Kearney, USA)

STUDENTS' MOTIVATIONAL ATTITUDES IN INTRODUCTORY STEM COURSES: THE RELATIONSHIP BETWEEN ASSESSMENT AND EXTERNALIZATION

Sarah Walters (Franklin W. Olin College of Engineering, USA)
Cesar Santana (Franklin W. Olin College of Engineering, USA)
Yevgeniya V Zastavker (Franklin W. Olin College of Engineering, USA)
Alex Dillon (Franklin W. Olin College of Engineering, USA)
Jonathan D. Stolk (Franklin W. Olin College of Engineering, USA)
Michael Gross (Wake Forest University, USA)

III: Undergraduate Research

Chair: Asad Azemi (Pennsylvania State University, USA)

8:30 AM - 10:00 AM

Room: 160B

UNDERSTANDING UNDERGRADUATE ENGINEERING RESEARCHERS AND HOW THEY LEARN

Lisa C. Benson (Clemson University, USA)
Marian S. Kennedy (Clemson University, USA)
Katherine M. Ehlert (Clemson University, USA)
Penelope M. D. Vargas (Clemson University, USA)
Courtney J. Faber (The College of New Jersey, USA)
Rachel L. Kajfez (The Ohio State University, USA)
Anne M. McAlister (The Ohio State University, USA)

IMPROVING STUDENT LEARNING EXPERIENCE VIA EXTRACURRICULAR UNDERGRADUATE RESEARCH IN NEAR-SPACE BALLOONING

Wookwon Lee (Gannon University, USA)
Nicholas B. Conklin (Gannon University, USA)

A SUB-ORBITAL EXPERIMENTAL PAYLOAD FOR ENGAGING UNDERGRADUATE ENGINEERING STUDENTS IN INTERDISCIPLINARY RESEARCH

Nicholas B. Conklin (Gannon University, USA)
Wookwon Lee (Gannon University, USA)

INTEGRAL AND TRANSFORMATIVE ENGINEERING COURSEWORK IN FORMATIVE RESEARCH FOR UNDERGRADUATE CURRICULA

Carlos Mugruza-Vassallo (Universidad de Lima, Peru)

USING ARCHIVAL MATERIALS TO STUDY THE INFLUENCE OF PUBLIC POLICY ON A HYDROELECTRIC PROJECT

Andrew Rose (University of Pittsburgh at Johnstown, USA)

S2A: Special Session: Making the Multiple Institution Database for Investigating Engineering Longitudinal Development (MIDFIELD) More Accessible to Researchers

10:30 AM - 12:00 PM

Room: 170A

MAKING THE MULTIPLE INSTITUTION DATABASE FOR INVESTIGATING ENGINEERING LONGITUDINAL DEVELOPMENT (MIDFIELD) MORE ACCESSIBLE TO RESEARCHERS

Matthew W. Ohland (Purdue University, USA)

Russell A. Long (Purdue University, USA)

Richard A. Layton (Rose-Hulman Institute of Technology, USA)

Susan M. Lord (University of San Diego, USA)

Marisa K. Orr (Louisiana Tech University, USA)

Catherine E. Brawner (Research Triangle Educational Consultants, USA)

S2B: Special Session: Designing The Engineer's Way

10:30 AM - 12:00 PM

Room: 170B

FIE 2016 SPECIAL SESSION - DESIGNING THE ENGINEER'S WAY

Susan K. Donohue (University of Virginia, USA)

Larry G. Richards (University of Virginia, USA)

S2C: Computer-Based Learning and Courseware Technologies II

Chair: Sven Esche (Stevens Institute of Technology, USA)

10:30 AM - 12:00 PM

Room: 130B

ONLINE PROGRAMMING TUTOR OR PAPER STUDY GUIDES?

Wendy Fisher (Colorado School of Mines, USA)

Cyndi Rader (Colorado School of Mines, USA)

Tracy Camp (Colorado School of Mines, USA)

IMPACT OF STEP-BASED TUTORING ON STUDENT LEARNING IN LINEAR CIRCUIT COURSES

B.J. Skromme (Arizona State University, USA)

V. Seetharam (Arizona State University, USA)

X. Gao (Arizona State University, USA)

B. Korrapati (Arizona State University, USA)

B.E. McNamara (Arizona State University, USA)

Y.-F. Huang (University of Notre Dame, USA)

D.G. Robinson (Colorado State University, USA)

IMPACT OF STATIC AND DYNAMIC VISUALIZATION IN IMPROVING OBJECT-ORIENTED PROGRAMMING CONCEPTS

Brandon Earwood (Texas A&M University-Kingsville)

Jeong Yang (Texas A&M University-Kingsville, USA)

Young Lee (Texas A&M University-Kingsville, USA)

IMPACT OF COLLABORATIVE LEARNING ON STUDENT PERCEPTION OF VIRTUAL COMPUTER LABORATORIES

Abdullah Konak (Penn State Berks, USA)

Michael R. Bartolacci (Penn State Berks, USA)

Sadan Kulturel-Konak (Penn State Berks, USA)

Mahdi Nasereddin (Penn State Berks, USA)

***DISCRETE MATHEMATICS FOR COMPUTING STUDENTS:
A PROGRAMMING ORIENTED APPROACH WITH ALLOY***

Leo C. Ureel, II (Michigan Technological University, USA)
Charles Wallace (Michigan Technological University, USA)

S2D: Diversity: Women and Girls

Chair: Alison Clear (EIT, New Zealand)

10:30 AM - 12:00 PM

Room: 130C

***TRAVEL GRANTS WHICH FACILITATE ENGINEERING LEADERSHIP IDENTITY IN FEMALE
ENGINEERING STUDENTS***

Mayari I. Serrano (Purdue University, USA)
Jennifer L. Groh (Purdue University, USA)

***EVIDENCE-BASED PLANNING TO BROADEN THE PARTICIPATION OF WOMEN
IN ELECTRICAL AND COMPUTER ENGINEERING***

Diane Rover (Iowa State University, USA)
Joseph Zambreno (Iowa State University, USA)
Mani Mina (Iowa State University, USA)
Phillip Jones (Iowa State University, USA)
Lora Leigh Chrystal (Iowa State University, USA)

***PRE- TO POST-CONFERENCE DIFFERENCES:
CELEBRATIONS OF WOMEN IN COMPUTING***

Gloria Childress Townsend (DePauw University, USA)
Kay Sloan (Rockman et al, USA)

GIRLS' INTEREST IN STEM

Henriette D. Burns (Washington State University, USA)
Kristin Lesseig (Washington State University, USA)
Nancy Staus (Oregon State University, USA)

***A METHODOLOGICAL REFINEMENT FOR STUDYING
THE STEM GRADE-POINT PENALTY***

Jonathan Tomkin (University of Illinois at Urbana Champaign, USA)
Matthew West (University of Illinois at Urbana-Champaign, USA)
Geoffrey L. Herman (University of Illinois at Urbana-Champaign, USA)

S2E: PK-12: Perceptions of STEM

Chair: Martin Kandlhofer (Graz University of Technology, Austria)

10:30 AM - 12:00 PM

Room: 140A

***PERSPECTIVE OF TEENAGERS ON TRAITS AND RESEARCH ASSOCIATED WITH ELECTRICAL
AND COMPUTER ENGINEERS AND THEIR RESEARCH***

Jennifer Winikus (Michigan Technological University, USA)
Glen Archer (Michigan Technological University, USA)

WHAT THEY SAY: BLACK CHILDREN TALK ABOUT LEARNING ENGINEERING

DeLean Tolbert (Purdue University, USA)
Monica Cardella (Purdue University, USA)

***LONG TERM EFFECTS OF EDUCATIONAL ROBOTS ON A GRADE 9 GIRL'S
PERCEPTIONS OF SCIENCE AND MATH***

Ahmad Khanlari (University of Toronto, Canada)

S2F: Computing Discipline Specific

Chair: Rebecca Reck (Kettering University, USA)

10:30 AM - 12:00 PM

Room: 140B

A SOFTWARE DEVELOPMENT COURSE BASED ON SERVER-SIDE JAVASCRIPT

Mark A. Holliday (Western Carolina University, USA)

Andrew S. Scott (Western Carolina University, USA)

***REPORT OF A DISTANCE LEARNING COURSE OF SPECIALIZATION
IN INFORMATION TECHNOLOGY AT A BRAZILIAN PUBLIC UNIVERSITY***

Guiou Kobayashi (Federal University of ABC, Brazil)

Francisco de Assis Zampiroli (Federal University of ABC, Brazil)

José Artur Quilici-Gonzalez (Federal University of ABC, Brazil)

WHO IS THE ENGINEERING TECHNOLOGY GRADUATE AND WHERE DO THEY GO?

Anne M. Lucietto (Purdue University, USA)

ELICITING FEATURES TO BUILD COLLABORATIVE LEARNING OBJECTS

Bruno Elias Penteado (University of São Paulo, Brazil)

Fernando Tiosso (University of São Paulo, Brazil)

EVALUATION OF ACOUSTICAL POSITION DETERMINATION IN A CLASSROOM SCENARIO

Robin Nicolay (University of Rostock, Germany)

Thomas Mundt (University of Rostock, Germany)

S2G: Student Approaches to Learning

Chair: Jill Nelson (George Mason University, USA)

10:30 AM - 12:00 PM

Room: 140C

***A CASE STUDY OF STUDENTS' ENGAGEMENT
IN A CONTROL SYSTEMS HOMEWORK PROBLEM***

Jessica Swenson (Tufts University, USA)

Kristen Wendell (Tufts University, USA)

***A QUANTITATIVE CASE STUDY ON STUDENTS' STRATEGY
FOR USING AUTHORIZED CHEAT-SHEETS***

Yang Song (NC State University, USA)

Yifan Guo (NC State University, USA)

David Thuente (NC State University, USA)

PRE-COLLEGE STUDENTS' USE OF SYSTEMS ENGINEERING METHODS IN DESIGN

Aaron W. Johnson (Tufts University, USA)

Sara Willner-Giwerc (Tufts University, USA)

Paul T. Grogan (Stevens Institute of Technology, USA)

Ethan E. Danahy (Tufts University, USA)

S2H: Peer Tutoring and Mentoring

Chair: Matthew Barner (Oregon State University, USA)

10:30 AM - 12:00 PM

Room: 160A

PEER LEARNING ASSISTANTS IN UNDERGRADUATE COMPUTER SCIENCE COURSES

Inna Pivkina (New Mexico State University, USA)

***THE IMPACT OF NEAR-PEER MENTORING ON SELF-EFFICACY
IN AN INTRODUCTORY ENGINEERING COURSE***

Tanya Kunberger (Florida Gulf Coast University, USA)
Chris Geiger (Florida Gulf Coast University, USA)

***GUIDELINES TO PRODUCING STRUCTURED INTEROPERABLE DATA FROM OPEN ACCESS
REPOSITORIES: AN EXAMPLE OF INTEGRATION OF DIGITAL REPOSITORIES OF HIGHER
EDUCATIONAL INSTITUTIONS FROM LATAM***

Nelson Piedra (Universidad Técnica Particular de Loja, Ecuador)
Janneth Chicaiza (Universidad Técnica Particular de Loja, Ecuador)
Jorge Lopez-Vargas (Universidad Técnica Particular de Loja, Ecuador)
Edmundo Tovar Caro (Universidad Politécnica de Madrid, Spain)

***ESTABLISHING LEARNING COMMUNITIES AMONG ENGINEERING FRESHMEN
THROUGH PEER-GROUP TUTORING PROGRAM***

Ben Oni (Tuskegee University, USA)
Vimal Viswanathan (Tuskegee University, USA)

S2I: Retention of First Year Students

Chair: Ciaran Moore (Victoria University of Wellington, New Zealand)

10:30 AM - 12:00 PM

Room: 160B

***ENGAGE AND EDUCATE: ENGINEERING LABORATORY ACTIVITIES
FOR FIRST-YEAR ENGINEERING STUDENTS***

Ramakrishnan Sundaram (Gannon University, USA)

***ENRICHED STUDENT GUIDANCE AND ENGAGEMENT IN LOWER LEVEL
ENGINEERING GATEKEEPER COURSES***

Horacio Vasquez (The University of Texas Rio Grande Valley, USA)
Arturo A. Fuentes (The University of Texas Rio Grande Valley, USA)
Javier A. Kypuros (The University of Texas Rio Grande Valley, USA)

***TECHNOLOGY-ENABLED, AFTER-HOURS, ASYNCHRONOUS, PEER-LED SUPPLEMENTARY
INSTRUCTION AND MENTORING IN ENGINEERING GATEKEEPER COURSES***

Javier A. Kypuros (The University of Texas Rio Grande Valley, USA)
Arturo A. Fuentes (The University of Texas Rio Grande Valley, USA)
Horacio Vasquez (The University of Texas Rio Grande Valley, USA)
Stephen W. Crown (The University of Texas Rio Grande Valley, USA)
Virgil Pierce (The University of Texas Rio Grande Valley, USA)

***S3A: Panel: Teaching Teachers to Teach Diverse Students in Computer Science: Content and Resources for In-
person and Online Delivery***

1:30 PM – 3:00 PM

Room: 170A

***TEACHING TEACHERS TO TEACH DIVERSE STUDENTS IN COMPUTER SCIENCE: CONTENT
AND RESOURCES FOR IN-PERSON AND ONLINE DELIVERY***

James P. Cohoon (University of Virginia, USA)
Joanne M. Cohoon (University of Virginia, USA)
Leslie G. Cintron (University of Virginia, USA)

S3B: Special Session: The Behavioral Economics of Instructional Decision Making

1:30 PM – 3:00 PM

Room: 170B

THE BEHAVIORAL ECONOMICS OF INSTRUCTIONAL DECISION MAKING

Cory Hixson (Rowan University, USA)

Stephanie Cutler (Penn State, USA)

James J. Pembridge (Embry-Riddle Aeronautical University, USA)

S3C: Redesigning Laboratory Experiences

Chair: Joshua Earnest (National Institute of Technical Teachers Training and Research, Bhopal, India)

1:30 PM – 3:00 PM

Room: 130B

PRACTICAL LABORATORY CLASSES TO IMPROVE ENGAGEMENT AND ACHIEVEMENT AMONGST ENGINEERING STUDENTS TAKING FIRST-YEAR MATHEMATICS

Ciaran Moore (Victoria University of Wellington, New Zealand)

Craig Watterson (Victoria University of Wellington, New Zealand)

James Eldridge (Victoria University of Wellington, New Zealand)

CHANGE THE TRADITIONAL WAY OF TEACHING ELECTRIC DRIVES LABORATORY WITH DESIGN OF EXPERIMENT

Lin Zhao (Gannon University, USA)

Fong Mak (Gannon University, USA)

A HANDS-ON MODULAR LABORATORY ENVIRONMENT TO FOSTER LEARNING IN CONTROL SYSTEM SECURITY

Pallavi P. Deshmukh (Virginia Tech, USA)

Cameron D. Patterson (Virginia Tech, USA)

William T. Baumann (Virginia Tech, USA)

EVALUATION OF A VIDEO GAME ADAPTATION FOR MECHANICAL ENGINEERING EDUCATIONAL LABORATORIES

Yizhe Chang (Stevens Institute of Technology, USA)

El-Sayed Aziz (Stevens Institute of Technology, USA)

Zhou Zhang (Stevens Institute of Technology, USA)

Mingshao Zhang (Stevens Institute of Technology, USA)

Sven K. Esche (Stevens Institute of Technology, USA)

S3D: Innovative Use of Tools

Chair: Georges El-Howayek (Valparaiso University, USA)

1:30 PM – 3:00 PM

Room: 130C

ENHANCE HANDS ON EXPERIENCE OF SYSTEM AND CONTROL USING LOW COST LEGO KITS

Yi Wu (Pennsylvania State University Erie, the Behrend College, USA)

Charlotte de Vries (Pennsylvania State University Erie, the Behrend College, USA)

Oladiipo Onipede (Pennsylvania State University Erie, the Behrend College, USA)

Melanie Ford (Pennsylvania State University Erie, the Behrend College, USA)

A SATELLITE GROUND STATION FOR TEACHING DIGITAL AND WIRELESS COMMUNICATIONS

Miguel Bazdresch (Rochester Institute of Technology, USA)

Sneha Velayudhan (Rochester Institute of Technology, USA)

William Johnson (Rochester Institute of Technology, USA)

APPLICATION OF LOW-COST 3D SCANNING TECHNOLOGIES TO THE DEVELOPMENT OF EDUCATIONAL AUGMENTED REALITY CONTENT

Jorge D. Camba (University of Houston, USA)
Alejandro Bonnet De Leon (Universidad de La Laguna, Spain)
Jorge de la Torre (Universidad de La Laguna, Spain)
Jose Luis Saorin (University de La Laguna, Spain)
Manuel Contero (Universidad Politécnica de Valencia, Spain)

TEACHERS' PERCEPTIONS ON TRADITIONAL AND NON-TRADITIONAL DATA VISUALIZATION FOR PEDAGOGICAL DECISION-MAKING

Maria Cavalcanti (Federal University of Alagoas, Brazil)
Ranilson Paiva (Federal University of Campina Grande, Brazil)
Patrícia Espinheira Ospina (Federal University of Pernambuco, Brazil)
Ig Ibert Bittencourt (Federal University of Alagoas, Brazil)
Esther de Freitas (Federal University of Alagoas, Brazil)
Sergio Amorim (Federal University of Alagoas, Brazil)
Alan Pedro da Silva (Federal University of Alagoas, Brazil)

AN APPROACH TO USING RASP TOOLS IN ANALOG SYSTEMS EDUCATION

Michelle Collins (Georgia Institute of Technology, USA)
Jennifer Hasler (Georgia Institute of Technology, USA)
Sahil Shah (Georgia Institute of Technology, USA)

S3E: PK-12: Assessment and Evaluation Tools and Strategies

Chair: Nathan M. Hicks (Purdue University, USA)

1:30 PM – 3:00 PM

Room: 140A

NO PATTERNS IN PATTERN RECOGNITION: A SYSTEMATIC LITERATURE REVIEW

Senay Purzer (Purdue University, USA)
Annwesa Dasgupta (Purdue University, USA)

DEVELOPMENT OF AN ASSESSMENT FOR MEASURING MIDDLE SCHOOL STUDENT ATTITUDES TOWARDS ROBOTICS ACTIVITIES

Jennifer Cross (Carnegie Mellon University, USA)
Emily Hamner (Carnegie Mellon University, USA)
Lauren Zito (Carnegie Mellon University, USA)
Illah Nourbakhsh (Carnegie Mellon University, USA)
Debra Bernstein (TERC, USA)

A SYSTEMATIC MAPPING STUDY ON ASSESSING COMPUTATIONAL THINKING ABILITIES

Ana Liz Souto O. de Araujo (Federal University of Campina Grande, Brazil)
Wilkerson L. Andrade (Federal University of Campina Grande, Brazil)
Dalton D. Serey Guerrero (Federal University of Campina Grande, Brazil)

IMPACT FOR FEMALE STUDENTS OF AN INTEGRATED STEM PBL SUMMER CURRICULUM ON CONTENT KNOWLEDGE MASTERY AND POST-SECONDARY MATRICULATION

Robert M. Capraro (Texas A&M University, USA)
Mary M. Capraro (Texas A&M University, USA)
Sandra B. Nite (Texas A&M University, USA)
Luciana R. Barroso (Texas A&M University, USA)
'Chon Brooks (Texas A&M University, USA)

***INNOVATIVE METHODS FOR EVALUATING THE SCIENCE CAPITAL
OF YOUNG CHILDREN***

Annie Padwick (Northumbria University, United Kingdom)
Opeyemi Dele-Ajayi (Northumbria University, United Kingdom)
Carol Davenport (Northumbria University, United Kingdom)
Rebecca Strachan (Northumbria University, United Kingdom)

S3F: Software Engineering Processes

Chair: Yolanda Martinez-Trevino (Tecnologico de Monterrey, Mexico)

1:30 PM – 3:00 PM

Room: 140B

***INVESTIGATING HOW FEATURES OF ONLINE LEARNING SUPPORT
SOFTWARE PROCESS EDUCATION***

Eduardo Fernandes (Federal University of Minas Gerais (UFMG), Brazil)
Johnatan Oliveira (Federal University of Minas Gerais (UFMG), Brazil)
Eduardo Figueiredo (Federal University of Minas Gerais (UFMG), Brazil)

AN AGILE SOFTWARE ENGINEERING PROCESS IMPROVEMENT GAME

Bruce R. Maxim (University of Michigan-Dearborn, USA)
Raspinder Kaur (University of Michigan-Dearborn, USA)
Christopher Apzynski (University of Michigan-Dearborn, USA)
David Edwards (University of Michigan-Dearborn, USA)
Ethan Evans (University of Michigan-Dearborn, USA)

***UTILIZING OPEN SOURCE SOFTWARE IN TEACHING PRACTICE-BASED
SOFTWARE ENGINEERING COURSES***

Mohsen Dorodchi (University of North Carolina, Charlotte, USA)
Nasrin Dehbozorgi (University of North Carolina, Charlotte, USA)

AGILE METRICS FOR A UNIVERSITY SOFTWARE ENGINEERING COURSE

Christoph Matthies (University of Potsdam, Germany)
Thomas Kowark (University of Potsdam, Germany)
Matthias Uflacker (University of Potsdam, Germany)
Hasso Plattner (University of Potsdam, Germany)

LEVERAGING ROLE PLAY TO EXPLORE SOFTWARE AND GAME DEVELOPMENT PROCESS

Adrienne Decker (Rochester Institute of Technology, USA)
David Simkins (Rochester Institute of Technology, USA)

S3G: Engineering in Global Context

Chair: Neha Choudhary (Purdue University, USA)

1:30 PM – 3:00 PM

Room: 140C

THE RESILIENT CIVIL ENGINEER WITH THE CHANGING GLOBAL ENVIRONMENT

Hudson Jackson (U.S. Coast Guard Academy, USA)
Kassim Tarhini (U.S. Coast Guard Academy, USA)
Sharon Zelmanowitz (U.S. Coast Guard Academy, USA)
Alina Zapalska (U.S. Coast Guard Academy, USA)

ENGINEERING THE ENGINEERING PROGRAM: THE YEAR OF DISCOVERY

Claudio da Rocha Brito (Science and Education Research Council, Brazil)
Melany M. Ciampi (World Council on Systems Engineering and Technology Information, Brazil)
Victor F. A. Barros (Science and Education Research Council, Portugal)
Luis Amaral (Computer Graphics Center, Portugal)
Rosa Vasconcelos (University of Minho, Portugal)

***STUDENT PERCEPTIONS OF GLOBAL KNOWLEDGE AND SKILLS ACQUIRED
DURING A FIVE-WEEK STUDY ABROAD PROGRAM***

Robert O'Connell (University of Missouri, USA)
Miguel Ayllon (University of Missouri, USA)

***MEASURING GLOBAL AWARENESS INTEREST DEVELOPMENT OF ENGINEERING
AND INFORMATION TECHNOLOGY STUDENTS***

Sadan Kulturel-Konak (Penn State Berks, USA)
Abdullah Konak (Penn State Berks, USA)
Ivan E. Esparragoza (Penn State Brandywine, USA)
Gül E. Okudan Kremer (Penn State University Park, USA)

S3H: Literature Reviews and Analyses

Chair: Carlos Mugruza-Vassallo (Universidad de Lima, Peru)

1:30 PM – 3:00 PM

Room: 160A

***VISUALIZING SYSTEMATIC LITERATURE REVIEWS
TO IDENTIFY NEW AREAS OF RESEARCH***

Allison Godwin (Purdue University, USA)

***UNDERSTANDING ENGINEERING THROUGH THE ENGINEERING JOURNAL
OF THE COLOMBIAN UNIVERSITY OF LOS ANDES***

Mariana Tafur-Arciniegas (University of Los Andes, Colombia)

***LEARNING PRINCIPLES IN PROGRAM VISUALIZATIONS:
A SYSTEMATIC LITERATURE REVIEW***

Jeisson Hidalgo-Céspedes (Universidad de Costa Rica, Costa Rica)
Gabriela Marín-Raventós (Universidad de Costa Rica, Costa Rica)
Vladimir Lara-Villagrán (Universidad de Costa Rica, Costa Rica)

***AUTHORSHIP/AUTHORING POSSIBILITIES IN THREE-DIMENSIONAL VIRTUAL WORLDS IN
EDUCATION: THE STATE OF ART FROM A SYSTEMATIC REVIEW***

Leander Cordeiro de Oliveira (Universidade Tecnológica Federal do Paraná - UTFPR, Brazil)
Marília Abrahão Amaral (Universidade Tecnológica Federal do Paraná - UTFPR, Brazil)
Danúbia BuenoEspíndola (Universidade Federal do Rio Grande - FURG, Brazil)
Regina Barwaldt (Universidade Federal do Rio Grande - FURG, Brazil)
Sílvia S. C. Botelho (Universidade Federal do Rio Grande - FURG, Brazil)

S3I: Students as Learners

Chair: Ben Oni (Tuskegee University, USA)

1:30 PM – 3:00 PM

Room: 160B

PEDAGOGICAL STANDARD FOR THE ANALYSIS OF VIRTUAL LEARNING ENVIRONMENTS

Rosana Abutakka Vasconcelos dos Anjos (The Federal University of Mato Grosso, Brazil)
Kátia Morosov Alonso (The Federal University of Mato Grosso, Brazil)
Cristiano Maciel (The Federal University of Mato Grosso, Brazil)
Alexandre Martins dos Anjos (The Federal University of Mato Grosso, Brazil)
Eunice dos Santos Nunes (The Federal University of Mato Grosso, Brazil)

***UNDERSTANDING SIMILARITIES AND DIFFERENCES IN STUDENTS ACROSS
FIRST-YEAR COMPUTING MAJORS***

Glen Archer (Michigan Technological University, USA)
Leonard Bohmann (Michigan Technological University)
Allison Carter (Michigan Technological University, USA)
Christopher Cischke (Michigan Technological University, USA)
Linda M. Ott (Michigan Technological University, USA)
Leo Ureel (Michigan Technological University, USA)

***COURSE MATERIAL DELIVERY IN ENGINEERING
USING BRAIN-BASED LEARNING TECHNIQUES***

John Solomon (Tuskegee University, USA)
Vimal Viswanathan (Tuskegee University, USA)
Vinu Unnikrishnan (University of Alabama, USA)
Eric Hamilton (Pepperdine University, USA)

THE VISUAL DIPOLE - A KEY TO UNDERSTANDING ANTENNA THEORY

Paul Crilly (United States Coast Guard Academy, USA)

S3J: Teaching and Learning Experiences in Engineering Education I

Chair: Jennifer Winikus (Michigan Technological University, USA)

1:30 PM – 3:00 PM

Room: 160C

USING EVERYDAY OBJECTS TO ENGAGE STUDENTS IN STANDARDS EDUCATION

Margaret Phillips (Purdue University, USA)
Paul McPherson (Purdue University, USA)

***OPTIMIZATION AND IMPROVEMENTS OF A MOODLE-BASED ONLINE LEARNING SYSTEM
FOR C PROGRAMMING***

Xiaohong Su (Harbin Institute of Technology, P.R. China)
Jing Qiu (Harbin Institute of Technology, P.R. China)
Tiantian Wang (Harbin Institute of Technology, P.R. China)
Lingling Zhao (Harbin Institute of Technology, P.R. China)

***MULTI-DIMENSIONAL AND CUSTOMIZABLE OPEN-SOURCE LABWARE
FOR PROMOTING BIG DATA ANALYTICAL SKILLS IN STEM EDUCATION***

Ying Xie (Kennesaw State University, USA)
Kai Qian (Kennesaw State University, USA)
Jing (Sena) He (Kennesaw State University, USA)

STUDENTS ENVISIONING THE FUTURE

Thomas Lind (Uppsala University, Sweden)
Åsa Cajander (Uppsala University, Sweden)
Bengt Sandblad (Uppsala University, Sweden)
Mats Daniels (Uppsala University, Sweden)
Marta Lárusdóttir (Reykjavik University, Iceland)
Roger McDermott (The Robert Gordon University, United Kingdom)
Tony Clear (Auckland University of Technology, New Zealand)

***A CONCEPT MAP-BASED COGNITIVE FRAMEWORK FOR ACQUIRING EXPERT KNOWLEDGE IN
INDUSTRIAL ENVIRONMENT***

Yuetong Lin (Indiana State University, USA)
A. Mehran Shahhosseini (Indiana State University, USA)
M. Affan Badar (Indiana State University, USA)
Tad Foster (Indiana State University, USA)
Jason Dean (Indiana State University, USA)

S4A: Leadership

Chair: Andrew Danowitz (California Polytechnic State University San Luis Obispo, USA)

3:30 PM – 5:00 PM

Room: 170A

***CORRELATION BETWEEN ENGINEERING STUDENT LEADERSHIP PRACTICES,
PERSONALITY TYPES, AND DEMOGRAPHIC CHARACTERISTICS***

Benjamin Ahn (Iowa State University, USA)

John G. Brisson (Massachusetts Institute of Technology, USA)

***A METHODOLOGICAL EVALUATION OF AN INTEGRATIVE PEDAGOGY FOR ENGINEERING
EDUCATION***

Cecilia Moloney (Memorial University of Newfoundland, Canada)

Janna Rosales (Memorial University of Newfoundland, Canada)

Cecile Badenhurst (Memorial University of Newfoundland, Canada)

S4B: Group and Team Work

Chair: Marc Sosnick-Pérez (San Francisco State University, USA)

3:30 PM – 5:00 PM

Room: 170B

***CAPSTONE: A CLOUD-BASED PLATFORM FOR MULTI-PARTY COLLABORATION ON CAPSTONE
PROJECTS***

Xiaocong Fan (Pennsylvania State University, USA)

***USING FRAME-OF-REFERENCE TRAINING TO IMPROVE THE DISPERSION OF PEER RATINGS IN
TEAMS***

Daniel M. Ferguson (Purdue University, USA)

Chad Lally (Purdue University, USA)

Hilda Ibriga Somnooma (Purdue University, USA)

Olivia Murch (Purdue University, USA)

Matthew W. Ohland (Purdue University, USA)

CONFIGURING AN APPROPRIATE TEAM ENVIRONMENT TO SATISFY RELEVANT CRITERIA

Charles Walter (University of Tulsa, USA)

Ian Riley (University of Tulsa, USA)

Rose Gamble (University of Tulsa, USA)

A TOOL FOR STUDENTS' GROUPING IN CLASSROOM

Sergio A. A. Freitas (University of Brasilia, Brazil)

Rita C. Silva (University of Brasilia, Brazil)

Edna D. Canedo (University of Brasilia, Brazil)

Tiago Franklin R. Lucena (Centro Universitário de Maringa, Brazil)

S4C: Identity, Learning and Persistence

Chair: Henriette Burns (Washington State University, USA)

3:30 PM – 5:00 PM

Room: 130B

***HOW SALIENT IS THE IDENTITY OF ENGINEERING STUDENTS?
ON THE USE OF THE ENGINEERING STUDENT IDENTITY SURVEY***

Olga Pierrakos (James Madison University, USA)

Nicholas A. Curtis (James Madison University, USA)

Robin D. Anderson (James Madison University, USA)

***UNDERSTANDING INTERSECTING SOCIAL IDENTITIES IN
ENGINEERING EDUCATION AND PRACTICE***

Javier A. Kypuros (University of Texas, USA)

Michelle Bothwell (Oregon State University, USA)

Charles S. Sasaki (Windward Community College, USA)

Jessica Lavariega Monforti (Pace University, USA)

Kelli Y. Nakamura (Kapi'olani Community College, USA)

Dwayne Plaza (Oregon State University, USA)

***A DEGREE IS NOT ENOUGH: PROMOTING ENGINEERING IDENTITY DEVELOPMENT AND
PROFESSIONAL PLANNING THROUGH THE TEACHING
OF ENGINEERING RÉSUMÉ WRITING***

Catherine G.P. Berdancier (The Pennsylvania State University, USA)

Mary McCall (Purdue University, USA)

Gracemarie Mike (Rowan University, USA)

***MOTIVATION AND IDENTITY IN C++: THE EFFECTS OF MUSIC IN
AN ENGINEERING CLASSROOM***

Courtney S. Smith-Orr (UNC Charlotte, USA)

Andrew Garnett (UNC Charlotte, USA)

***HIGH IMPACT PRACTICES TOWARD PERSONAL AND PROFESSIONAL IDENTITY
IN INTRODUCTORY AND ADVANCED ENGINEERING SEMINAR COURSES***

Kurt A. Thoroughman (Washington University in St. Louis, USA)

Joseph A. O'Sullivan (Washington University in St. Louis, USA)

S4D: Student-Centered Education

Chair: Renata A. Revelo (University of Illinois at Chicago, USA)

3:30 PM – 5:00 PM

Room: 130C

ACTUALIZING STUDENTS' PRIOR KNOWLEDGE IN ENGINEERING EDUCATION

Qaiser Malik (National University of Sciences and Technology, Pakistan)

Naveed Zafar (National University of Sciences and Technology, Pakistan)

Mohammad Javed Khan (Tuskegee University, USA)

***A CRITICAL ANALYSIS OF TRENDS IN STUDENT-CENTRIC ENGINEERING EDUCATION
AND THEIR IMPLICATIONS FOR LEARNING***

Arnold Pears (Uppsala University, Sweden)

Aletta Nylén (Uppsala University, Sweden)

Mats Daniels (Uppsala University, Sweden)

THE FIRST STEP TOWARDS A PRE-REQUISITE KNOWLEDGE TRACKING ARCHITECTURE FOR ENGINEERING PROGRAMS

Chitra R. Nayak (Tuskegee University, USA)
Vimal Viswanathan (Tuskegee University, USA)
John Solomon (Tuskegee University, USA)

USING PROCESS MAPPING TO UNDERSTAND ENGINEERING STUDENTS' CONCEPTIONS OF INNOVATION PROCESSES

Todd Fernandez (Purdue University, USA)
Senay Purzer (Purdue University, USA)
Nicholas D. Fila (Purdue University, USA)

A FRAMEWORK FOR WRITING LEARNING AGREEMENTS

Tony Clear (Auckland University of Technology, New Zealand)
Roger McDermott (Robert Gordon University, United Kingdom)
Elin Parsjö (Uppsala University, Sweden)
Åsa Cajander (Uppsala University, Sweden)
Mats Daniels (Uppsala University, Sweden)
Nanna Lagerqvist (Uppsala University, Sweden)

S4E: PK-12: Pathways to Careers

Chair: Henry Griffith (Michigan State University, USA)
3:30 PM – 5:00 PM
Room: 140A

INFORMAL STEM CAMP INFLUENCES ON ENGINEERING CONFIDENCE

Ali Bicer (Texas A&M University, USA)
Sandra B. Nite (Texas A&M University, USA)
Robert M. Capraro (Texas A&M University, USA)
Luciana R. Barroso (Texas A&M University, USA)
Mary M. Capraro (Texas A&M University, USA)
Jeffrey E. Froyd (Texas A&M University, USA)

ENGINEERING AND COMPUTATIONAL THINKING TALENT IN MIDDLE SCHOOL STUDENTS: A FRAMEWORK FOR DEFINING AND RECOGNIZING STUDENT AFFINITIES

Jennifer Cross (Carnegie Mellon University, USA)
Emily Hamner (Carnegie Mellon University, USA)
Lauren Zito (Carnegie Mellon University, USA)
Illah Nourbakhsh (Carnegie Mellon University, USA)

ENHANCING CONTINUITY BETWEEN GENDER DIVERSITY INTERVENTIONS USING HYBRID SOCIAL NETWORKS

Henry Griffith (Michigan State University, USA)
Faezeh Hajiaghajani (Michigan State University, USA)
Angela Griffith (Wright State University, USA)

THE ROLES OF SOCIALIZERS IN CAREER CHOICE DECISIONS FOR HIGH SCHOOL STUDENTS IN RURAL CENTRAL APPALACHIA: "WHO'S DOING WHAT?"

Cheryl Carrico (Virginia Polytechnique Institute and State University, USA)
Homero Murzi (Virginia Polytechnique Institute and State University, USA)
Holly Matusovich (Virginia Polytechnique Institute and State University, USA)

A SYNCHRONOUS DISTANCE EDUCATION HYBRID MODEL OF COLLEGE-LEVEL CREDITS FOR HIGH-SCHOOL STUDENTS

Manuel Jimenez (Univ. of Puerto Rico at Mayagüez, Puerto Rico)
Sonia Bartolomei (Univ. of Puerto Rico at Mayagüez, Puerto Rico)
Ysela Ochoa (Univ. of Puerto Rico at Mayagüez, Puerto Rico)
Wilma Santiago (Univ. of Puerto Rico at Mayagüez, Puerto Rico)

S4F: Evaluating Computer Programming

Chair: Nannan He (Minnesota State University at Mankato, USA)

3:30 PM – 5:00 PM

Room: 140B

***SIMPLE FEEDBACK CAN DO THE JOB: ANALYZING THE EFFECTS OF SIMPLE
COMPUTER BASED FEEDBACK FOR FUNDAMENTAL PROGRAMMING TASKS***

Matthias Laengrich (University of Applied Sciences Zittau / Goerlitz, Germany)

***QUALITATIVE ASPECTS OF STUDENTS' PROGRAMS:
CAN WE MAKE THEM MEASURABLE?***

Eliane Araujo (Federal University of Campina Grande, Brazil)

Dalton Serey (Federal University of Campina Grande, Brazil)

Jorge Figueiredo (Federal University of Campina Grande, Brazil)

TYPES OF ASSESSING STUDENT-PROGRAMMING KNOWLEDGE

Anabela Gomes (University of Coimbra, Portugal)

Fernanda Brito Correia (University of Aveiro, Portugal)

Pedro Henriques Abreu (University of Coimbra, Portugal)

APPLYING SPECTRUM-BASED FAULT LOCALIZATION ON NOVICE'S PROGRAMS

Eliane Araujo (Federal University of Campina Grande, Brazil)

Matheus Gaudencio (Federal University of Campina Grande, Brazil)

Dalton Serey (Federal University of Campina Grande, Brazil)

Jorge Figueiredo (Federal University of Campina Grande, Brazil)

AUTOMATED STYLE FEEDBACK FOR ADVANCED BEGINNER JAVA PROGRAMMERS

Hannah Blau (University of Massachusetts, USA)

Samantha Kolovson (University of Massachusetts, USA)

W. Richards Adrion (University of Massachusetts, USA)

Robert Moll (University of Massachusetts, USA)

S4G: Cultural Competence

Chair: Katherine Ehlert (Clemson University, USA)

3:30 PM – 5:00 PM

Room: 140C

***INCREASING DIVERSE STUDENTS' PERSISTENCE IN ENGINEERING:
A SOCIAL COGNITIVE PERSPECTIVE***

Heather K. Hunt (University of Missouri, USA)

Lisa Y. Flores (University of Missouri, USA)

Rachel L. Navarro (University of North Dakota, USA)

Hang-Shim Lee (Oklahoma State University, USA)

***ENRICHING AN INFORMAL ENGINEERING EDUCATION PROGRAM WITH SOCIAL
RELEVANCE AND HISTORY FOR MIDDLE SCHOOL GIRLS***

Ann Reimers (University of Virginia, USA)

John F. Smith (University of Pennsylvania, USA)

PROMOTING LGBTQ EQUALITY IN ENGINEERING VIA ONLINE SAFE ZONE WORKSHOPS

Rocio C. Chavela Guerra (American Society for Engineering Education, USA)

Stephanie Farrell (Rowan University, USA)

Alexandra Longo (American Society for Engineering Education, USA)

THE PROMISE OF FACULTY CARE IN UNDERGRADUATE STEM COURSES

Robert Siegel (Franklin W. Olin College of Engineering, USA)
March Saper (Franklin W. Olin College of Engineering, USA)
Emilia Tanu (Franklin W. Olin College of Engineering, USA)
Yevgeniya V. Zastavker (Franklin W. Olin College of Engineering, USA)
Jonathan D. Stolk (Franklin W. Olin College of Engineering, USA)
Alex Dillon (Franklin W. Olin College of Engineering, USA)
Michael D. Gross (Wake Forest University, USA)

S4H: Learning and Teaching Analytics

Chair: Mohsen Dorodchi (University of North Carolina, Charlotte, USA)

3:30 PM – 5:00 PM

Room: 160A

MEASURING COGNITIVE ENGAGEMENT THROUGH INTERACTIVE, CONSTRUCTIVE, ACTIVE AND PASSIVE LEARNING ACTIVITIES

Nicole P. Pitterson (Oregon State University, USA)
Shane Brown (Oregon State University, USA)
Jason Pascoe (Oregon State University, USA)
Kathleen Quardokus Fisher (Oregon State University, USA)

VISUALIZING THE LESSON PROCESS IN ACTIVE LEARNING CLASSES

Masahiro Toyoura (University of Yamanashi, Japan)
Mayato Sakaguchi (University of Yamanashi, Japan)
Xiaoyang Mao (University of Yamanashi, Japan)
Masanori Hanawa (University of Yamanashi, Japan)
Masayuki Murakami (Kyoto University of Foreign Studies, Japan)

INTEGRATING ANALYTICS AND SURVEYS TO UNDERSTAND FULLY ENGAGED LEARNERS IN A HIGHLY-TECHNICAL STEM MOOC

Nathan M. Hicks (Purdue University, USA)
Doipayan Roy (Purdue University, USA)
Siddharth Shah (Purdue University, USA)
Kerrie A. Douglas (Purdue University, USA)
Peter Bermel (Purdue University, USA)
Heidi A. Diefes-Dux (Purdue University, USA)
Krishna Madhavan (Purdue University, USA)

TEACHER INTERVENTIONS TO ENHANCE THE QUALITY OF STUDENT COMMENTS AND THEIR EFFECT ON PREDICTION PERFORMANCE

Shaymaa E. Sorour (Kyushu University, Japan)
Shaimaa Abd El Rahman (Kafrelsheikh University, Egypt)
Tsunenori Mine (Kyushu University, Japan)

IMPROVED METHOD FOR CREATING CRITERION MAPS FOR AUTOMATIC MIND MAP ANALYSIS

Amber Franklin (Miami University, USA)
Ryan Sunderhaus (Miami University, USA)
Chris Bell (Miami University, USA)
Peter Jamieson (Miami University, USA)

S4I: Curriculum Design in Computer Science/Engineering

Chair: Sami Khorbotly (Valparaiso University, USA)

3:30 PM – 5:00 PM

Room: 160B

TEACHING PROGRAMMING AS APPLICATION DEVELOPMENT FROM THE GROUND UP

David R. Mudgett (The Pennsylvania State University, USA)

Steven R. Haynes (The Pennsylvania State University, USA)

FLIPPING THE CS1 AND CS2 CLASSROOMS IN CENTRAL ASIA

Benjamin Tyler (Nazarbayev University, Kazakhstan)

Madina Abdrakhmanova (Nazarbayev University, Kazakhstan)

COLLABORATIVE PROBLEM SOLVING AND ACHIEVEMENT IN A DISCRETE-TIME SIGNALS AND SYSTEMS COURSE

Daria Gerasimova (George Mason University, USA)

Jill K. Nelson (George Mason University, USA)

EXPLORING ELECTRICAL ENGINEERING THROUGH MOVEMENT: GOING WITH THE FLOW AND PROGRAMMING PUZZLES

Emily Marasco (University of Calgary, Canada)

Stephanie Hladik (University of Calgary, Canada)

Laleh Behjat (University of Calgary, Canada)

William Rosehart (University of Calgary, Canada)

S4J: Teaching and Learning Experiences in Engineering Education II

Chair: Joan Banks-Hunt (Virginia Tech, USA)

3:30 PM – 5:00 PM

Room: 160C

A MULTIDIMENSIONAL DATA MODEL FOR THE ANALYSIS OF LEARNING MANAGEMENT SYSTEMS UNDER DIFFERENT PERSPECTIVES

Vanessa Araujo Borges (University of Sao Paulo, Brazil)

Bruno Nogueira (Federal University of Mato Grosso do Sul, Brazil)

Ellen Francine Barbosa (University of São Paulo, Brazil)

MODELING REAL-WORLD OBJECTS: CONNECTING SOLIDWORKS TO TOY ADAPTATION

Olga M. Stavridis (The Ohio State University, USA)

Rachel L. Kajfez (The Ohio State University, USA)

Elizabeth A. Riter (The Ohio State University, USA)

Molly Y. Mollica (The Ohio State University, USA)

INTEGRATING COMPLEX AVIATION SCIENCE PROJECTS INTO UNDERGRADUATE ENGINEERING EDUCATION WITH DIALECTIC DESIGN APPROACH AND COMPARATIVE PERFORMANCE ANALYSIS FOR INNOVATIVE PRACTICES

I. Dabipi (University of Maryland Eastern Shore, USA)

Willie L. Brown, Jr (University of Maryland Eastern Shore, USA)

Lei Zhang (University of Maryland Eastern Shore, USA)

Christopher Hartman (University of Maryland Eastern Shore, USA)

FULLY INTEGRATING REMOTE STUDENTS INTO A TRADITIONAL CLASSROOM USING LIVE-STREAMING AND TEACHBACK

William T. Tarimo (Brandeis University, USA)

Timothy J. Hickey (Brandeis University, USA)

**THE UNIVERSITY OF MICHIGAN'S M-STEM ACADEMIES PROGRAM: EXAMINING THE SOCIAL
COMMUNITY OF FUTURE ENGINEERS**

Joi-Lynn Mondisa (University of Michigan, USA)
Joanna Millunchick (University of Michigan, USA)
Cinda Davis (University of Michigan, USA)
Darryl Koch (University of Michigan, USA)

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