

ANNUAL REPORT 2002 – DSP TC, IEEE CAS SOCIETY

Chairman: Prof. P. S. R. Diniz
Secretary: Prof. T. Saramäki
Past Chairman: Prof. Y. C. Lim

- (1) TC Meeting: The Digital Signal Processing Technical Committee met from 12:00hr till 14:00hr on the 8th of June in the year 2001, in a meeting room in Parkroyal Hotel at Darlington Harbour in Sydney, Australia, during ISCAS 2001. Twelve members and five invited researchers attended the meeting to approve last year's minutes, report activities sponsored by the DSP Technical committee, report on-going Technical Committee activities and discuss future plans and activities. Prof. H. K. Kwan was elected as the incoming Secretary of the committee. The members attending the meeting are Y. C. Lim, P. S. R. Diniz, T. Saramäki, H. Johansson, Y. Miyanaga, Y.-F. Huang, M. Kawamata, T. Hinamoto, H. K. Kwan, K. Parhi, T. Stouraitis, and L. Karam. The invited researchers are K. Egiazarian, B. Nowrouzian, Z. Lin, W. X. Zheng, M. N. S. Swamy and J. A. Nossek.

- (2) The following new members have been voted into the TC:
 - (a) Prof. M. N. S. Swamy, Department of Electrical and Computer Engineering, Concordia University, 1455 de Maisonneuve Blvd. West Montreal, Quebec, Canada H3G 1M8, e-mail: swamy@ece.concordia.ca
 - (b) Prof. Josef A. Nossek, Munich University of Technology, Arcisstr. 21, 80333 Munich, Germany, e-mail: nossek@nws.ei.tum.de
 - (c) Assoc. Professor Zhiping LIN, School of Electrical and Electronic Engineering, Nanyang Technological University, Nanyang Ave., Singapore 639798, e-mail: ezplin@ntu.edu.sg
 - (d) Prof. Wei Xing Zheng, School of Quantitative Methods and Mathematical Sciences, University of Western Sydney, Kingswood Sydney, NSW 2747, Australia, email: zheng@uws.edu.au
 - (e) Prof. Behrouz Nowrouzian, Department of Electrical and Computer Engineering, University of Alberta, Edmonton, Alberta, Canada T6G 2G7, e-mail: nowr@ee.ualberta.ca
 - (f) Prof. Karen Egiazarian, Institute of Signal Processing, Tampere University of Technology, P. O. Box 553, FIN-33101 Tampere, Finland, e-mail: karen@cs.tut.fi
 - (g) Prof. Yong Hoon Lee resigned from the DSP TC because his major research area of interest has been shifted to communication systems and theory.

- (3) Conferences or workshops where the DSP TC or members of the TC was/were actively involved in 2001 include the followings:
 - (a) Prof. Paulo Diniz was the DSP track chair for ISCAS 2001 and he will be a cochair in 2002.
 - (b) Prof. Zhiping Lin was the Program Co-Chair of the Third International Conference on Information, Communications and Signal Processing (ICICS 2001), Singapore, October 2001.
 - (c) Prof. Zhiping Lin co-organized and co-chaired the special session entitled "Techniques for Multidimensional Systems and Signal Processing" at ISCAS 2001. The session, with 20 papers, was divided into four sub-sessions and was well attended by many participants.
 - (d) Prof. S. Basu was elected as the Chair of the Steering Committee of the IEEE International Conference on Multimedia & Expo (ICME).
 - (e) Prof. S. Basu organized a special session entitled "mD Signals and Systems" at ISCAS 2001 (co-organized with Zhiling Lin) and at ISCAS 2002.
 - (f) Prof. T. Stouraitis was a member of the TP Committee and Steering Committee of IEEE CASS-supported ICECS 2001 - held in Malta, September 2001.
 - (g) Prof. M. Gabbouj organized and chaired WIAMIS 2001, the European workshop on multimedia interactive services in Tampere. Two special issues of the journal of applied signal processing were

dedicated to this important international event, mainly sponsored by the EU COST 211 quat. The action was headed by Prof. M. Gabbouj.

- (h) Prof. M. Gabbouj served as the Publicity Chair of the 2001 Nonlinear Signal and Image Processing (NSIP 2001) workshop held in the Inner Harbor of Baltimore Maryland, June 3-6, 2001. The workshop was sponsored jointly by the IEEE and the EURASIP (European Association for Signal Processing). The DSP TC served as a sponsor of the workshop, which is held every two years. Additional information on NSIP 2001 can be found at: <http://www.ece.udel.edu/NSIP>.
 - (i) Prof. Y. Miyanaga was a member of the Steering Committee of ASP-DAC (Asia and South Pacific, Design Automation Conference 2001), Pacifico Yokohama, Yokohama, Japan, January 30 – February 2, 2001. The conference was sponsored jointly by IEEE Circuits and Systems and IEICE. The goal of the conference was to provide a forum for presentations, discussions, and observations of the state-of-the-art of Design Automation (DA) technologies, and design methodologies of electronic systems.
 - (j) Prof. Y. Miyanaga was a member of the Steering Committee of the 2001 International Symposium on Communications and Information Technology (ISCIT 2001), Chiang Mai Orchid Hotel, Chiang Mai, Thailand, November 14–16, 2001. In addition, Prof. Y. Miyanaga gave a keynote speech entitled "A System on A Chip for Digital Media Processing". ISCIT 2001 was organized jointly by IEEE Communication Society and IEEE Thailand Section.
 - (k) Profs. T. Saramäki and K. Egiazarian were Co-Chairmen together with Prof. Jaakko Astola of the 2001 International Workshop on Spectral Methods and Multirate Signal Processing (SMMSIP 2001) held in Pula, Croatia, June 16–18, 2001. The main purpose of the workshop was to bring together some of the leading experts working on transforms, filter banks, and multirate filtering in general and to create a friendly and relaxed atmosphere to talk about the most important issues in these fields. We managed very well and ended up with the proceedings of 36 articles, see <http://sigwww.dmi.tut.fi/TICSP/> for details.
 - (l) Profs. T. Saramäki and K. Egiazarian organized three special sessions entitled "Filters and Filter Banks: Design and Optimization", "Spectral Methods, Transforms and Their Applications", and "Wavelets and Applications", at the Second International Symposium on Image and Signal Processing and Analysis (ISPA 2001), Pula, Croatia, June 19–21, 2001.
 - (m) Prof. T. Saramäki organized a special session entitled "Optimization of Digital filters" at the 15th European Conference on Circuit Theory and Design (ECCTD 2001), Espoo, Finland, August 28–31, 2001.
 - (n) Ass. Prof. H. Johansson organized a special session entitled "Frequency Response Masking Techniques" at ISCAS 2001.
 - (o) Prof. J. B. Evans was the Co-Chairman of the 2001 IEEE Gigabit Networking Workshop (GBN 2001) held in Anchorage, Alaska in April 2001. GBN 2001 was sponsored by the IEEE Communications Society Technical Committee on Gigabit Networking and is traditionally held concurrently with Infocom.
 - (p) Prof. H. K. Kwan was the Co-Chair and Co-Organizer (with Dr. Ravi P. Ramachandran, Rowan University) of a Special Session entitled "Audio and Speech Processing" at the 2002 IEEE International Symposium on Circuits and Systems, Scottsdale, Arizona, May 26–29, 2002. He also served as a Technical Program Committee Member of the ISCAS 2002.
- (4) On going activities:
- (a) Profs. T. Saramäki and K. Egiazarian are Co-Chairmen together with Prof. Jaakko Astola of the 2002 International Workshop on Spectral Methods and Multirate Signal Processing (SMMSIP 2002) to be held Toulouse, France, September 7–8, 2002. See <http://sigwww.dmi.tut.fi/TICSP/>. The main purpose of the workshop is again to bring together some of the leading experts working on transforms, filter banks, and multirate filtering in general and to create a friendly and relaxed atmosphere to talk about the most important issues in these fields.
 - (b) Prof. S. Basu is the Tutorial Chair for the IEEE Signal Processing Society workshop on Multimedia Signal Processing to be held in December 2002 in Virgin Islands.

- (c) Prof. L. Karam is organizing a special session entitled "Filter Design and Structures" at the 2002 Asilomar Conference on Signals, Systems, and Computers to be held the 3 to 6 of November in Pacific Grove, CA, USA.
 - (d) Prof. Y. Miyanaga is a member of the Steering Committee of the 2002 International Symposium on Communications and Information Technology (ISCIT 2002) to be held in Central Hotels & Resorts, Pattaya, Thailand, October 23–25, 2002. ISCIT 2002 is organized jointly by IEEE Communication Society, IEEE Thailand Section, and IEICE.
 - (e) Prof. Y. Miyanaga is the General co-Chair of ISPACS 2002 (The 2002 IEEE International Symposium on Intelligent Signal Processing and Communication Systems) to be held in Ambassador Hotel, Kaohsiung, Taiwan, R.O.C., November 21–24, 2002. IEEE Communications Society and IEEE SP Society are technical co-sponsors for ISPCAS 2002.
 - (f) Ass. Prof. H. Johansson organized together with Dr. Yong Lian a special session entitled "Frequency Response Masking Techniques" at ISCAS 2002.
 - (g) Profs. T. Saramäki and Y. C. Lim are organizing a special session entitled "Filter Design and Structures" at the 9th International Conference on Electronics, Circuits, and Systems (ICECS 2002) to be held in Dubrovnic, Croatia, September 15–18, 2002. See <http://www.icecs2002.org/>.
- (5) Some of the activities of the TC's members are listed below:
- (a) Books and book chapters:
 - (i) P. S. R. Diniz, E. A. B. da Silva, and S. L. Netto, *Digital Signal Processing: System Analysis and Design*. Cambridge University Press, New York, NY, 2002.
 - (ii) P. S. R. Diniz, *Adaptive Filtering: Algorithms and Practical Implementation*. Kluwer Academic Publishers, Boston, MA, Second edition, 2002 (570 pages).
 - (iii) H. K. Kwan, "Multiplierless Designs for Artificial Neural Networks," Chapter 13 in *Neural Networks and Systolic Array Design*, edited by David Zhang and Sankar K. Pal, under the Series in Machine Perception and Artificial Intelligence, World Scientific Publishing Company Pte Ltd., 2001.
 - (iv) H. K. Kwan, "Fuzzy Median Filters For Noises Reduction In Signals And Image," a Book Chapter in *Fuzzy Filters for Image Processing*, edited by M. Nachtgael, D. Van der Weken, D. Van De Ville, and E. E. Kerre, under the Series in Studies in Fuzziness and Soft Computing, Springer-Verlag, July 2002.
 - (v) T. Saramäki and R. Bregovic, "Multirate Systems and Filter Banks," Chapter II in *Multirate Systems: Design & Applications*, edited by Gordana Jovanovic-Dolecek, Ideal Group Publishing, 2002.
 - (vi) H. Johansson and L. Wanhammar, "Design and Implementation of Multirate Digital Filters," Chapter IX in *Multirate Systems: Design & Applications*, edited by Gordana Jovanovic-Dolecek, Ideal Group Publishing, 2002.
 - (b) Short courses:
 - (i) Prof. S. Basu is the organizer and principal lecturer at NATO Advanced Study Institute for the course entitled "Statistical Learning Theory and Applications", July 2002, in Leuven Belgium.
 - (ii) Prof. Saramäki has been since 1995 the main lecturer and organizer of four intensive DSP courses to the industrial people through EDUTECH, the institute of Tampere University of Technology taking care of educating people outside the university.
 - (c) Plenary session, keynote speakers, invited lectures:
 - (i) Prof. P. S. R. Diniz gave an invited talk entitled "Adaptive Filtering: From Basics to Current Applications" at the National Chiao Tung University, Hsinchu, Taiwan, March 26, 2001 (IEEE Distinguished Lecturer Program).

- (ii) Prof. P. S. R. Diniz gave an invited talk entitled "Data-Selective and Data-Reusing Normalized LMS Algorithm" at the National Taiwan University, Taipei, Taiwan, March 28, 2001 (IEEE Distinguished Lecturer Program).
 - (iii) Prof. P. S. R. Diniz gave an invited talk entitled "Data-Selective and Data-Reusing Normalized LMS Algorithm" at the National Cheng-Kung University, Tainan, Taiwan, March 29, 2001 (IEEE Distinguished Lecturer Program).
 - (iv) Prof. P. S. R. Diniz gave an invited talk entitled "Data-Selective and Data-Reusing Normalized LMS Algorithm" the National University of Singapore, Singapore, May 14, 2001 (IEEE Distinguished Lecturer Program).
 - (v) Prof. P. S. R. Diniz gave an invited talk entitled "Low Complexity Cosine-Modulated Filter Banks using Frequency-Response Masking" at the Helsinki University of Technology, Espoo, Finland, August 21, 2001 (IEEE Finland Session Lecture).
 - (vi) Prof. Y.-F. Huang gave an invited talk entitled "Adaptive Set-Membership Filtering and Its Applications to Emerging Communication Technologies" at the National Chiao Tung University, Hsinchu, Taiwan, March 26, 2001; at the National Taiwan University, Taipei, Taiwan, March 28, 2001; and at the National Cheng-Kung University, Tainan, Taiwan, March 29, 2001 (IEEE Distinguished Lecturer Program).
 - (vii) Prof. Y.-F. Huang gave an invited talk entitled "Multistage Interference Cancellation for Wireless Communications - A Set-Membership Filtering Approach" in New Jersey Institute of Technologies, March 14, 2001 (IEEE Distinguished Lecturer Program).
 - (viii) Prof. Y. C. Lim presented talks at Hong Kong Polytechnic University (18–21 June 2001); Mahanakorn University of Technology (3 July 2001); Sirindhorn International Institute of Technology (4 July 2001); Federal University of Rio de Janeiro (26 November 2001); Universidad Argentina de la Empresa (29 November 2001); Naval Postgraduate School (4 December 2001); Hokkaido University (10 December 2001); Tohoku University (12 December 2001); and Hiroshima University (14 December 2001) (IEEE Distinguished Lecturer Program).
 - (ix) Prof. T. Saramäki gave three invited lectures entitled "Efficient DSP Algorithms and Their Optimization for Signal Processor and VLSI Implementations"; "Design of Digital Filters and Filter Banks by Optimization: Applications"; and "Polynomial-Based Interpolation for Digital Signal Processing Applications – A Tutorial Review" at the National University of Singapore, October 19–23, 2001.
 - (x) Prof. T. Saramäki gave two invited lectures entitled "Polynomial-Based Interpolation for Digital Signal Processing Applications – A Tutorial Review", at the second IEEE South-American Workshop on Circuits and Systems (SAWCAS 2001), Rio de Janeiro, Brazil, November 26–28, 2001, Buenos Aires, Argentina, November 28–30, 2001.
 - (xi) Prof. A. E. Cetin invited IEEE CAS Distinguished Speaker Prof. Edgar Sanchez-Sinencio to Turkey. He gave talks at Sabanci University, Technical University of Istanbul and the plenary talk at a local conference in Bursa, Turkey.
 - (xii) Prof. H. K. Kwan gave an invited lecture entitled "Fuzzy inference networks for pattern classification and recognition," at Hong Kong Polytechnic University; National University of Singapore; City University of Hong Kong; Chinese University of Hong Kong; Hong Kong University of Science and Technology; and University of Hong Kong during his April-May 2001 academic visits to Hong Kong and Singapore.
- (d) Editorial and IEEE services:
- (i) Prof. L. Karam - Associate Editor, IEEE Transactions on Image Processing.
 - (ii) Prof. J. B. Evans - Associate Editor, IEEE Communications Letters.
 - (iii) Prof. J. B. Evans - Chair, IEEE Communications Society Technical Committee on Gigabit Networking.
 - (iv) Prof. P. S. R. Diniz - Associate Editor, IEEE Transactions on Signal Processing.
 - (v) Prof. T. Nguyen - Associate Editor, IEEE Transactions on Circuits and Systems II.
 - (vi) Prof. T. Nguyen - Associate Editor, IEEE Transactions on Image Processing.
 - (vii) Prof. T. Nguyen - Associate Editor, IEEE Signal Processing Letters.
 - (viii) Prof. W. X. Zheng - Associate Editor, IEEE Transactions on Circuits and Systems I.

- (ix) Prof. Zhiping Lin - Editorial Board Member, Journal of Multidimensional Systems and Signal Processing; Guest Editor: Special issue of the Journal of Multidimensional Systems and Signal Processing on "Applications of Grobner bases to multidimensional systems and signal processing", July 2001.
 - (x) Prof. Zhiping Lin - Associate Editor, Circuits, Systems and Signal Processing.
 - (xi) Prof. S. Basu co-edited a special issue on multidimensional signals and systems for IEEE Transactions on Circuits and Systems I to appear 2002.
 - (xii) Prof. S. Basu co-edited a special issue on multimedia database for the IEEE Transactions on Multimedia to appear June 2002.
 - (xiii) Prof. S. Basu co-edited a special issue on multimedia communication for the Journal of VLSI Signal and Image Processing (Kluwer) to appear 2003.
 - (xiv) Prof. S. Basu - Editorial Board Member of the Journal of Multidimensional Systems and Signal Processing, Kluwer Academic Publishers.
 - (xv) Prof. S. Basu - Editorial Board Member of the EURASIP Journal of Applied Signal Processing.
 - (xvi) Prof. S. Basu - Associate Editor (1999-2001), IEEE Transactions on Circuits and Systems I.
 - (xvii) Prof. S. Basu - Associate Editor (1999-2001), IEEE Transactions on Multimedia.
 - (xviii) Prof. T. Stouraitis - Associate Editor, IEEE Transactions on Circuits and Systems I.
 - (xix) Prof. T. Stouraitis - Associate Editor, IEEE Transactions on Circuits and Systems II.
 - (xx) Prof. T. Stouraitis - Associate Editor, IEEE Transactions on VLSI.
 - (xxi) Prof. T. Stouraitis - Regional Editor-Europe, Journal of Circuits, Systems, and Computers.
 - (xxii) Prof. Y.-F. Huang - Treasurer, Steering Committee, IEEE Transactions on Multimedia.
 - (xxiii) Prof. Y. C. Lim is editing a special issue on Frequency Response Masking Technique for Circuits, Systems, and Computers.
 - (xxiv) Prof. A. E. Cetin served as the IEEE CAS Chapter Chair of Turkey Section.
 - (xxv) Prof. A. E. Cetin organized one seminar at Bilkent University in Ankara and two seminars at Sabanci University in Istanbul as the IEEE CAS Chapter Chair.
 - (xxvi) Profs. M. Gabbouj and T. Saramäki undertook the leadership of the IEEE Finland Section by occupying the Chairman and Secretary positions, respectively. Robert Bregovic, also from Tampere University of Technology, assumed the Treasurer position. Our immediate plans include close cooperation with our DSP TC, membership development, student branch re-activation and the creation of new chapters in Finland.
 - (xxvii) Prof. S. M. Phoong - Associate Editor, IEEE Transactions Circuits and Systems II.
 - (xxviii) Prof. S. M. Phoong - Associate Editor, IEEE Signal Processing Letters.
 - (xxix) Prof. H. K. Kwan - Secretary (5/2000–5/2001), Chair-Elect (5/2001–5/2002), Chair (5/2002–5/2003) of Neural Systems and Applications Technical Committee of the IEEE Circuits and Systems Society.
 - (xxx) Prof. T. Saramäki is co-editing together with Dr. Yong Lian a special issue on Frequency Response Masking Technique and Its Applications for Circuits, Systems, and Signal Processing, to appear in February 2003.
 - (xxxi) Prof. T. Saramäki, - Associate Editor (2000–2001), IEEE Transactions on Circuits and Systems II.
 - (xxxii) Ass. Prof. H. Johansson -Associate Editor (2000–2001), IEEE Transactions on Circuits and Systems II.
 - (xxxiii) Prof. Y.C. Lim - Associate Editor (1999–2001), IEEE Transactions on Circuits and Systems II.
 - (xxxiv) Prof. A. Enis Cetin, - Associate Editor, IEEE Transactions on Image Processing.
 - (xxxv) Prof. K.Egiazarian, - Associate Editor, Journal of Electronic Imaging, SPIE.
- (e) Tampere International Center for Signal Processing (TICSP), Tampere University of Technology: The Center has acquired the status of Center of Excellence given by the Academy of Finland 2000-2005. The Director for TICSP is Prof. Jaakko Astola. Three of the DSP TC members, Profs. K. Egiazarian, M. Gabbouj, and T. Saramäki, are heavily involved in arranging the activities of TICSP. Profs. K. Egiazarian, M. Gabbouj, and T. Saramäki are the Team Leaders in SPAG (Signal Processing Algorithm Group). Several TC members (Profs. Pitas, Bellanger, Gabbouj and Nguyen) are members of the Advisory Board of TICSP. TICSP is an institute created to provide a proper

environment for a rapid transfer of the latest ideas between first-class researchers in industry and academia. Its purpose is to provide a proper logistic, financial and human resource environment to adequately host exchanges of highly competent researchers. TICSP invites for periods of 2 to 12 months researchers at all levels: visiting professors, post-doctorate, and Ph.D. students, to engage research at the Signal Processing Laboratory in cooperation with the researchers of the neighboring academic and industrial research institutes. The main purpose is to generate fruitful cooperation between scientists all around the world. Part of the activities of TICSP is organizing workshops. It has also its own publication series to appear twice a year. For more information, visit the homepage at URL: <http://sigwww.cs.tut.fi/TICSP/>.

- (f) A research laboratory in Image, Video, and Usability (IVU) (<http://www.eas.asu.edu/~image>) has been established in the Telecommunications Research Center at Arizona State University. Prof. L. J. Karam is the person in charge.
 - (g) Prof. Thanos Stouraitis directs the newly established International multidisciplinary Graduate Program on "Signal and Image Processing". The Program is based since 1998 in the Univ. of Patras, Patras, Greece. Offers a diverse program of about 15 courses and students graduate after they complete a research thesis. They are aggressively sought after by international industry. More info can be found at <http://www.upatras.gr/dsp/>.
- (6) Some good news from the TC members are listed below:
- (a) Prof. S. Basu and T. Saramäki were elected as IEEE Fellows.
 - (b) Prof. T. Saramäki was elected as a Distinguished Lecturer for the CAS society for the year 2002.
- (7) The DSP Technical committee will meet again on the 28th of May, Tuesday, starting at 12:00 in a meeting room in Scottsdale Princess Resort Hotel.