

# Message from the Editor-in-Chief: Best Paper Award Recipients

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**Abstract**—The reputation of the IEEE TRANSACTIONS ON SIGNAL PROCESSING rests on the high quality of its articles and on the dedicated service and expertise of its editorial board and reviewers. In this yearly column, we are pleased to announce the TRANSACTIONS articles that have been selected to receive 2003 Best Paper Awards. We would also like to encourage our readers to nominate TRANSACTIONS papers for awards. Nominations can be submitted online through the TRANSACTIONS website.

## I. BEST PAPER AWARDS

THREE articles from the TRANSACTIONS have been selected by the IEEE Signal Processing Society to receive the 2003 Best Paper Award. This award honors the author(s) of a paper of exceptional merit dealing with a subject related to the Society's technical scope, irrespective of the author's age. Eligibility for this award is based on a three-year window preceding the year of election (viz., 2001 to 2003 for this year), and judging is based on general quality, originality, subject matter, and timeliness. The 2003 awardees are as follows.

- 1) **Thierry Blu** and **Michael Unser**, for the paper entitled "Wavelets, fractals, and radial basis functions," *IEEE Transactions on Signal Processing*, vol. 50, no. 3, pp. 543–553, March 2002. The contribution of this paper is a new interpretation of multiresolution analysis that does not require scaling but only shifting of special atoms that are eigen-solutions of the two-scale relation. Using this formulation, the authors establish a theoretical connection between radial basis functions, fractals, and wavelets. In particular, they provide a time-domain characterization of scaling functions and wavelets as a sum of harmonic splines. This new formula explains why wavelets are fractal-like.
- 2) **Jean-Jacques Fuchs**, for the paper entitled "On the application of the global matched filter to DOA estimation with uniform circular arrays," *IEEE Transactions on Signal Processing*, vol. 49, no. 4, pp. 702–709, April 2001. The article presents a deconvolution approach that allows restoration of sparse spike trains. It is called the "Global Matched Filter" (GMF), and an application to a direction-of-arrival (DOA) estimation problem is presented. The GMF fits simultaneously to the data all the components required to explain it up to a chosen level of accuracy.
- 3) **Jaume Riba**, **Josep Sala**, and **Gregori Vazquez**, for the paper entitled "Conditional maximum likelihood timing

recovery: Estimators and rounds," *IEEE Transactions on Signal Processing*, vol. 49, no. 4, pp. 835–850, April 2001. This paper develops an approach to low-complexity nondata-aided (NDA) timing estimators. By treating the unknown signal as deterministic, and by using the conditional maximum likelihood (CML) framework developed in array processing, the paper bridges the gap between the discrete and continuous time contexts found in array processing and synchronization problems, respectively.

## II. YOUNG AUTHOR BEST PAPER AWARDS

Four additional papers from the TRANSACTIONS have been selected to receive the 2003 Young Author Best Paper Award, which honors the author(s) of an especially meritorious paper dealing with a subject related to the Society's technical scope and whose lead author, upon the date of submission of the paper, is less than 30 years of age. The 2003 awardees follow.

- 1) **Ramon F. Breich**, for the paper co-authored with Abdelhak M. Zoubir and Per Pelin, entitled "Detection of sources using bootstrap techniques," *IEEE Transactions on Signal Processing*, vol. 50, no. 2, pp. 206–215, Feb 2002. In this paper, the source detection problem in array processing is formulated as a statistical hypothesis test for equality of the eigenvalues of the sample array covariance. Minimal assumptions are made on the distribution of the observations by using the nonparametric bootstrap method to estimate the finite sample distributions of the test statistics. When the sample size is small or the observations are non-Gaussian, this can improve performance over existing techniques such as the sphericity test.
- 2) **Aleksandar Dogandzic**, for the paper co-authored with Arye Nehorai, entitled "Space-time fading channel estimation and symbol detection in unknown spatially correlated noise," *IEEE Transactions on Signal Processing*, vol. 50, no. 3, pp. 457–474, March 2002. This paper develops maximum likelihood methods for space-time fading channel estimation in spatially correlated noise having unknown covariance; the results are applied to symbol detection. A concentrated-likelihood receiver is proposed, and its efficient recursive implementation is derived. It is also shown that the Cramér–Rao bounds for the directions of arrival are decoupled from those of the time delays and Doppler shifts.
- 3) **Deniz Erdogmus**, for the paper co-authored with José C. Principe, entitled: "An error-entropy minimization algorithm for supervised training of nonlinear adaptive systems," *IEEE Transactions on Signal Processing*,

vol. 50, no. 7, pp. 1780–1786, July 2002. This paper proposes the differential entropy of the residual error as an optimality criterion for adaptation in supervised learning. The paper shows that minimizing the error entropy equivalently minimizes an information theoretic divergence between the adaptive system output and desired output signal distributions. Utilizing a Parzen window-based nonparametric estimator for entropy, which is shown to preserve the desired global minimum of the actual error entropy, an information-theoretic supervised learning algorithm for linear and nonlinear neural networks is derived.

- 4) **Constantinos Papadias**, for the paper entitled “Globally convergent blind source separation based on a multiuser kurtosis maximization criterion,” *IEEE Transactions on Signal Processing*, vol. 48, no. 12, pp. 3508–3519, December 2000. This paper addresses the problem of blind source separation of instantaneous mixtures of an arbitrary number of i.i.d. input sources. The proposed multiuser kurtosis (MUK) algorithm is based on the spatial filter parameters and is derived by using a constrained higher order statistics (HOS)-based criterion that imposes a deflation-type (Gram–Schmidt) optimization structure. The MUK algorithm is shown to be globally convergent, for any number of input sources, to a setting that recovers them all.



**Thierry Blu** (M'96) was born in Orléans, France, in 1964. He received the “Diplôme d'ingénieur” degree from École Polytechnique, Paris, France, in 1986 and from Télécom Paris (ENST), in 1988. He received the Ph.D. degree in electrical engineering from ENST in 1996 for a study on iterated rational filterbanks applied to wideband audio coding.

Since 1998, he has been with the Biomedical Imaging Group, Swiss Federal Institute of Technology (EPFL), Lausanne, Switzerland, on leave from France Télécom National Center for Telecommunications Studies (CNET), Issy-les-Moulineaux, France. His research interests include (multi)wavelets, multiresolution analysis, multirate filterbanks, approximation and sampling theory, psychoacoustics, optics, and wave propagation.

Dr. Blu is currently serving as an Associate Editor for the IEEE TRANSACTIONS ON IMAGE PROCESSING.



**Ramon F. Bricch** received the B.Eng. (Hons 1) degree in aerospace avionics from Queensland University of Technology, Brisbane, Australia, in 1998 and the Ph.D. degree in electrical engineering from Curtin University of Technology (CUT), Perth, Australia, in 2003.

In 2002 he was a Research Fellow with the School of Electrical Engineering, CUT. Since March 2003, he has been a Research Associate with the Signal Processing Group, Technische Universität Darmstadt, Darmstadt, Germany. His research

interests include modeling, estimation, and detection for heavy-tailed processes and robust signal processing.



**Aleksandar Dogandzic** (M'01) received the Dipl. Ing. degree (summa cum laude) in electrical engineering from the University of Belgrade, Belgrade, Yugoslavia, in 1995 and the M.S. and Ph.D. degrees in electrical engineering and computer science from the University of Illinois at Chicago (UIC) in 1997 and 2001, respectively.

In August 2001, he joined the Department of Electrical and Computer Engineering, Iowa State University, Ames, as an Assistant Professor. His research interests are in statistical signal processing theory and

applications.

Dr. Dogandzic received the Distinguished Electrical Engineering M.S. Student Award from the Chicago Chapter of the IEEE Communications Society in 1996. He was awarded the Aileen S. Andrew Foundation Graduate Fellowship in 1997 and the UIC University Fellowship in 2000. He is the recipient of the 2001 Outstanding Thesis Award in the Division of Engineering, Mathematics, and Physical Sciences, UIC.



**Deniz Erdogmus** (M'02) received the B.S. degree in electrical and electronics engineering and mathematics in 1997 and the M.S. degree in electrical and electronics engineering, with emphasis on systems and control, in 1999, both from the Middle East Technical University, Ankara, Turkey. He received the Ph.D. degree in electrical and computer engineering from the University of Florida, Gainesville, in 2002.

He was a Research Engineer with the Defense Industries Research and Development Institute (SAGE), Ankara, from 1997 to 1999. Since 1999, he has been with the Computational NeuroEngineering Laboratory, University of Florida, working with Dr. J. C. Principe, first as a research assistant and then as a post-doctoral research associate. His current research interests include information theoretic, statistical, adaptive, and nonlinear signal processing with applications to communications, biomedical engineering, and control systems.

Dr. Erdogmus is a member of Tau Beta Pi and Eta Kappa Nu.



**Jean-Jacques Fuchs** (M'81) graduated from the Ecole Supérieure d'Electricité, Paris, France, in 1973 and received the M.S. degree in electrical engineering from the Massachusetts Institute of Technology, Cambridge, in 1974.

After a short period in industry with Thomson-C.S.F., he joined the Institut de Recherche en Informatique et Systemes Aléatoires (IRISA), Rennes, France, in 1976. Since 1983, he has been a professor at the Université de Rennes. His research interests shifted from adaptive control and

identification, in which he obtained the These d'Etat in 1982, toward signal processing. He is now involved in array processing and inverse problems.



**Constantinos Papadias** (M'96–SM'03) received the diploma of electrical engineering from the National Technical University of Athens (NTUA), Athens, Greece, in 1991 and the Ph.D. degree in signal processing (highest honors) from the Ecole Nationale Supérieure des Télécommunications (ENST), Paris, France, in 1995.

Since 1997, he has been with the Wireless Research Laboratory of Bell Labs, Holmdel, NJ, where he oversees several research projects in the general area of current and next generation wireless systems. He participates in several research projects within the European Commission's Information Society Technologies (IST) program and represents Lucent Technologies at the steering board of the Wireless World Research Forum (WWRF). He is guest co-editor of an upcoming special issue on MIMO Communications and Signal Processing of the *EURASIP Journal on Applied Signal Processing*, as well as an upcoming book on MIMO systems.

Dr. Papadias received the IEEE Signal Processing Society's 2003 Young Author Best Paper Award. He is a member of the Signal Processing for Communications Technical Committee of the IEEE Signal Processing Society and Associate Editor for the IEEE TRANSACTIONS ON SIGNAL PROCESSING. He is a member of the Technical Chamber of Greece.



**Jaume Riba** was born in Barcelona, Spain, in 1966. He received the M.Sc. and Ph.D. degrees in telecommunications engineering from the Technical University of Catalonia (UPC), Barcelona, in 1992 and 1997, respectively.

In 1992, he joined the Department of Signal Theory and Communications (TSC) and the Signal Processing and Communications Group (SPC) of UPC as Assistant Professor and was promoted to Associate Professor in 1997. His current research interests are in the area of signal processing, communications, and wireless location, with particular emphasis on array processing and digital synchronization techniques. He has been involved in several signal processing research and development projects in the framework of the European Space Agency research programs. He was the principal investigator of the IST project called the European Mobile Integrated Location System (EMILY) at UPC from 2001 to 2004.

Dr. Riba was a Guest Editor for a Special Issue for Signal Processing for Positioning and Navigation with Applications to Communications. He is a recipient of the 2003 Best Paper Award of the IEEE Signal Processing Society.



**Josep Sala** was born in Callús, Spain, in 1967. He received the M.Sc. and Ph.D. degrees in telecommunications engineering from the Technical University of Catalonia (UPC), Barcelona, Spain, in 1991 and 1995, respectively.

During 1992, he was working at the European Space Operations Center (ESOC) of the European Space Agency (ESA), Darmstadt, Germany, in the area of software engineering for telemetry processing. From 1993 to late 1994, he held a grant from the Generalitat de Catalunya in support of the PhD. degree at the Department of Signal Theory and Communications, UPC. In 1994, he joined this department as Assistant Professor and was promoted to Associate Professor in late 1997. His current research interests are in the area of signal processing, communications, and information theory. He is also involved in the field of ASIC architectures for communications and signal processing applications in the context of departmental research and participation of projects with European industries. He has participated in numerous projects on the design of advanced communications systems for the European Space Agency.

Dr. Sala received the Best Doctoral Thesis National Award in 1995, the International Symposium on Turbo Codes and Related Applications Best Poster Paper Award in 2003, and the IEEE Signal Processing Society Best Paper Award in 2003.



**Michael Unser** (F'99) received the M.S. (summa cum laude) and Ph.D. degrees in electrical engineering in 1981 and 1984, respectively, from the Swiss Federal Institute of Technology (EPFL), Lausanne, Switzerland.

From 1985 to 1997, he was with the Biomedical Engineering and Instrumentation Program, National Institutes of Health, Bethesda, MD, where he was heading the Image Processing Group. He is now Professor and Director of the Biomedical Imaging Group, EPFL. His main research area is biomedical image processing. He has a strong interest in sampling theories, multiresolution algorithms, wavelets, and the use of splines for image processing. He is the author of over 100 published journal papers in these areas.

Dr. Unser is the associate Editor-in-Chief of the IEEE TRANSACTIONS ON MEDICAL IMAGING and the Editor-in-Chief of the *Wavelet Digest*: the electronic newsletter of the wavelet community. He has acted as associate editor or member of the editorial board for another eight international journals, including the IEEE SIGNAL PROCESSING MAGAZINE, the IEEE TRANSACTIONS ON IMAGE PROCESSING (from 1992 to 1995), and the IEEE SIGNAL PROCESSING LETTERS (from 1994 to 1998). He serves as regular chair for SPIE's conference on wavelets, which has been held annually since 1993. He was general co-chair for the first IEEE International Symposium on Biomedical Imaging (ISBI'2002), which was held in Washington, DC, July 7–10, 2002. He is recipient of three best paper awards (IMDSP-1995, 2000 Magazine Award, and SP-2003) from the IEEE Signal Processing Society.



**Gregori Vázquez** (SM'98) was born in Barcelona, Spain, in 1961. He received the M.S. and Ph.D. degrees in telecommunications engineering from the Technical University of Catalonia (UPC), Barcelona, in 1984 and 1988, respectively.

He is a Professor with the Department of Signal Theory and Communications, UPC. His general interests are statistical signal processing and digital communications.

Dr. Vázquez is a recipient of the 2003 Best Paper Award of the IEEE Signal Processing Society. He has been serving as Associate Editor of the IEEE TRANSACTIONS ON SIGNAL PROCESSING since 1999 and also serves as a member of the Editorial Board of the IEEE SIGNAL PROCESSING MAGAZINE and as a member of the Signal Processing for Communications Technical Committee. He is the Chairman of the Research Program on Communications of the Spanish Science and Technology Ministry.