EXPERT SUMMARIES

PRESENTED BY

Rama Chellapa *Renato De Mori* *Georgios B. Giannakis* *Hans Georg Musmann* *Hermann Ney*
Mark Smith *John Treichler* *Michael D. Zoltowski*

1. SPEECH PROCESSING

1.1. Feature Extraction and Word Recognition

summarized by **Renato de Mori**, McGill University, Montreal, Canada.

Renato De Mori received a doctorate in electronic engineering from Politecnico di Torino in Torino, Italy, in 1967. He became a full professor in Italy in 1975. Since 1968, he has been a professor and director of the School of Computer Science at McGill University, Montreal, Canada.

In 1991, Dr. De Mori became an associate of the Canadian Institute for Advanced Research and project leader of the Institute for Robotics and Intelligent Systems, a Canadian center of excellence. He is the author of many publications in the areas of computer systems, pattern recognition, artificial intelligence, and connectionist models. His research interests are in stochastic parsing techniques, automatic speech understanding, connectionist models, and program understanding.

Dr. De Mori is a fellow of the IEEE and a member of the IEEE Computer Society.

1.2. Language Modelling and Search

summarized by **Hermann Ney**, University of Technology (RWTH), Aachen, Germany.

Hermann Ney received the Diplom degree in physics from the University of Goettingen, Germany in 1977 and the Dr.-Ing. degree in electrical engineering from the TU Braunschweig (University of Technology), Germany in 1982.

In 1977 he joined Philips Research Laboratories, first in Hamburg, then in Aachen, Germany where he worked on various aspects of speaker verification, isolated and connected word recognition and large vocabulary continuous speech recognition. In 1985 he was appointed head of the Speech and Pattern Recognition group.

In 1988-1989, he was a visiting scientist at AT&T Bell Laboratories in Murray Hill, NJ, USA. In 1993 Dr. Ney joined the RWTH Aachen (university of Technology), Germany, as a professor of computer science.

His work has concentrated on the application of dynamic programming and statistical techniques for decision making in context. His current interests cover all aspects of pattern and speech recognition, such as signal processing, search strategies, language modeling and automatic learning.

2. DIGITAL SIGNAL PROCESSING

2.1. Multirate Systems, Filterbanks, and Wavelets

summarized by **Mark J.T. Smith**, Georgia Institute of Technology, Atlanta, USA.

Mark J.T. Smith received the S.B. degree from the Massachusetts Institute of Technology in 1978 and the M.S. and Ph.D. degrees from the Georgia Institute of Technology in 1979 and 1984 respectively, all in Electrical Engineering. He is presently a professor in the School of Electrical Engineering at Georgia Tech, where he is involved in research in the areas of speech and image processing, filter banks and wavelets, and object detection and recognition.

Dr. Smith is a Fellow of the IEEE and has authored many papers in the area of signal processing, four of which have received IEEE awards. He is the co-author or co-editor of three books.

Dr. Smith was formerly Chairman of the IEEE Digital Signal Processing Technical Committee and serves on the Board of Governors of the IEEE Signal Processing Society. He has served as an Associate Editor for the Transactions on ASSP and as a member of the MIPs Advisory Board of the National Science Foundation.

2.2. Digital and Adaptive Filters

summarized by **John Treichler**, Applied Signal Technology, Inc., Sunnyvale, USA.

John Treichler received his doctorate in electrical engineering from Stanford University in Palo Alto, California in 1977. He joined ARGOSystems, Inc in 1977 to apply digital signal processing concepts to advanced communications systems. In 1983 he became an Associate Professor in the School of Electrical Engineering at Cornell University in Ithaca, New York.

In 1984 Dr. Treichler co-founded Applied Signal Technology, Inc. in Sunnyvale, California and became its Senior Scientist. This company designs and builds signals reconnaisance equipment. In addition to his corporate endeavors, he is the author and co-author of many technical papers and two books, all in his research area of adaptive digital filtering and its applications to communications problems.

Dr. Treichler is a Fellow of the IEEE and a member of both the IEEE Signal Processing Society and the IEEE Communications Society.

3. IMAGE AND MULTIDIMENSIONAL SIGNAL PROCESSING

3.1. Video Coding

summarized by **Hans Georg Musmann**, University of Hannover, Hannover, Germany.

Hans Georg Musmann was born in Wiedelah, Germany, in 1935. He received the Dipl.-Ing. degree in Electrical Engineering in 1962, and the Dr.-Ing. degree in 1966, both from the Technische Universität Braunschweig, Germany. From 1966 to 1973 he was employed at the 'Institut für Nachrichtentechnik' of the Technische Universität Braunschweig, where he was involved in studies of digital communication systems with emphasis on source encoding. There he received the Habilitation and became Associate Professor in 1970.

Since 1973 he is Full Professor and Head of the 'Institut für Theoretische Nachrichtentechnik und Informationsverarbeitung' at the Universität Hannover, Germany. His main research field is image and sound coding. Dr. Musmann is author and co–author of about 50 research papers and holder of 12 patents. He received the Award of the Nachrichtentechnische Gesellschaft 1971 and the K.H. Beckurts Award 1991.

Dr. Musmann is an member of the 'Akademie der Wissenschaften zu Göttingen', of the Academia Europaea Cambridge and of the 'Braunschweigische Wissenschaftliche Gesellschaft'.

3.2. Image Processing

summarized by **Rama Chellapa**, University of Maryland, College Park, USA.

Rama Chellappa is a Professor of Electrical Engineering and an affiliate Professor of Computer Science at the University of Maryland in College Park. He is also affiliated with the Center for Automation Research (Associate Director) and the Institute for Advanced Computer Studies. Over the last fifteen years he has published numerous book chapters and peer-reviewed journal papers.

He has received several awards, including the 1985 NSF Presidential Young Investigator Award, a 1985 IBM Faculty Development Award, the 1991 Excellence in Teaching Award from the School of Engineering at USC, and the 1992 Best Industry Related Paper Award from the International Association of Pattern Recognition (with Q. Zheng). He has been recently elected as a Distinguished Research Fellow (1996-1998) at the University of Maryland.

He is a Fellow of the IEEE and the International Association for Pattern Recognition.

His current research interests are image compression, automatic target recognition from stationary and moving platforms, surveillance and monitoring, automatic design of vision algorithms, synthetic aperture radar image understanding, and commercial applications of image processing and understanding.

4. STATISTICAL SIGNAL AND ARRAY PROCESSING

4.1. Statistical Processing

summarized by **Georgios B. Giannakis**, University of Virginia, Charlottesville, USA.

Georgios B. Giannakis received his Diploma in Electrical Engineering from the National Technical University of Athens, Greece, 1981. From September 1982 to July 1986 he was with the University of Southern California (USC), where he received his MSc. in Electrical Engr., 1983, MSc. in Mathematics, 1986, and Ph.D. in Electrical Engr., 1986.

After lecturing for one year at USC, he joined the Dept. of Electrical Engr. at the University of Virginia in September 1987, where he is an associate professor since 1992. His general interests lie in the areas of signal processing, estimation and detection theory, communications, and system identification. Specific research areas of current interest include diversity techniques for channel estimation and multiuser communications, nonstationary and cyclostationary signal analysis, wavelets in statistical signal processing, and non-Gaussian signal processing using high-order statistics with applications to sonar, array and image processing.

G. B. Giannakis received the IEEE Signal Processing Society's 1992 Paper Award in the Statistical Signal and Array Processing (SSAP) area. He is a member of the IMS and the European Association for Signal Processing.

4.2. Array Processing

summarized by **Michael D. Zoltowski**, Purdue University, West Lafayette, USA.

Michael D. Zoltowski received his Ph.D. from the Moore School of Electrical Engineering at the University of Pennsylvania in August 1986. In Fall 1986, he joined the faculty of Purdue University where he currently holds the position of Associate Professor of Electrical Engineering.

Dr. Zoltowski was the recipient of the IEEE Signal Processing Society's 1991 Paper Award for the Statistical Signal and Array Processing Technical Area. He is presently an associate editor for the IEEE Transactions on Signal Processing, a member of the Technical Committee for the Statistical Signal and Array Processing Area of the IEEE Signal Processing Society, and a member of the Education Committee as well. He is a contributing author to Adaptive Radar Detection and Estimation, Wiley, 1991, Advances in Spectrum Analysis and Array Processing, Vol. III, Prentice-Hall, 1994, and the CRC Handbook on Digital Signal Processing, CRC Press, 1996.

His present research interests include space-time adaptive processing and blind antenna array beamforming for all areas of mobile and wireless communications, radar, and GPS.