Table of Contents
Volume III
Thursday, September 9th, 2004

Session ThuPmOR1: Adaptive Filters II
Chair: Colin Cowan, Queen’s University of Belfast, UK

A LATTICE PREDICTOR BASED ADAPTIVE VOLterra FILTER AND A SYNCHRONIZED LEARNING ALGORITHM ................................................................. 1585
Kenji Nakayama, Kanazawa Univ., Japan; Akihiro Hirano, Kanazawa Univ., Japan; and Hiroaki Kashimoto, Kanazawa Univ., Japan

A POLYPHASE MODEL FOR FAST AFFINE PROJECTION WITH PARTIAL FILTER UPDATE .......... 1589
Edward Chau, Hamid Sheikhzadeh and Robert L. Brennan, Dspfactory Ltd., Canada

SEQUENTIAL LMS FOR LOW-RESOURCE SUBBAND ADAPTIVE FILTERING: OVERSAMPLED IMPLEMENTATION AND POLYPHASE ANALYSIS .............................................. 1593
Hamid Sheikhzadeh, Dspfactory Ltd., Canada; Hamid Reza Abutalebi, Yazd University, Iran; Robert L. Brennan, Kevin R. L. Whyte and Edward Chau, Dspfactory Ltd., Canada

EFFICIENT DESIGN OF ADAPTIVE COMPLEX NARROWBAND IIR FILTERS ............................. 1597
Georgi Iliev, Tampere University of Technology, Finland; Zlatka Nikolova, Georgi Stoyanov, Technical University of Sofia, Bulgaria; and Karen Egiazarian, Tampere University of Technology, Finland

AN EXACT ANALYSIS OF THE LMS ALGORITHM WITH TONAL REFERENCE SIGNALS IN THE PRESENCE OF FREQUENCY MISMATCH .................................................. 1601
Hideaki Sakai and Yoichi Hinamoto, Kyoto University, Japan

Session ThuPmOR2: Pattern Recognition
Chair: Jean Philippe Thiran, Swiss Federal Institute of Technology, Switzerland

SIMILARITY MEASURE FOR HETEROGENEOUS MULTIVARIATE TIME-SERIES ..................... 1605
Florence Duchene, Catherine Garbay and Vincent Rialle, Laboratory TIMC-IMAG, FRANCE

FOOTSTEP PATTERN MATCHING FROM PRESSURE SIGNALS USING SEGMENTAL SEMI-MARKOV MODELS ................................................................. 1609
Kalle Koho, Jaakko Suutala, Tapio Seppänen and Juha Röning, University of Oulu, Dept. of Electrical and Information Engineering, Finland

GENERIC TARGET RECOGNITION ................................................................. 1613
Christophe Rosenberger, LVR, France; Alain Rakotomamonjy, PSI, France; and Bruno Emile, LVR, France

A FEATURE DETECTION METHOD FOR PULMONARY MYCOBACTERIUM TUBERCULOSIS USING CONVENTIONAL CHEST RADIOGRAPHS ........................................... 1617
Mohd. Noor Norliza, UniversitiTeknologi Malaysia, Malaysia; Mohd. Rijal Omar, University of Malaya, Malaysia; and Yun Fah Chang, Multimedia University, Malaysia

A DISCONTINUITY DETECTOR FOR BUILDING EXTRACTION FROM DIGITAL ELEVATION MODELS BY STOCHASTIC GEOMETRY ...................................................... 1621
Mathias Ortner, Xavier Descombes and Josiane Zerubia, Ariana Group (CNRS/INRIA/UNSA), France
Session ThuPmOR3: Rapid Prototyping
Chair: Zoran Salcic, University of Auckland, New Zealand

PROTOTYPING EMBEDDED DSP SYSTEMS - FROM SPECIFICATION TO IMPLEMENTATION .......... 1625
Zoran Salcic, The University of Auckland, New Zealand

MULTIPLE CLOCK CYCLE REAL-TIME IMPLEMENTATION OF A SYSTEM FOR TIME-FREQUENCY
ANALYSIS ................................................................. 1633
Veselin Ivanovic and LJubisa Stankovic, Dept. of Electrical Engineering, University of Montenegro, Yugoslavia

SIMULATION TOOL AND RAPID PROTOTYPING FOR CDMA2000 ........................................ 1637
Marta De Nobili, Robert Stewart, Strathclyde University, UK; and Graham Freeland, EnTegra Ltd., UK

ALGORITHMIC MODIFICATION OF PARTICLE FILTERS FOR HARDWARE IMPLEMENTATION ...... 1641
Miodrag Bolic, Akshay Athalye, Petar Djuric and Sangjin Hong, Stony Brook University, USA

Session ThuPmPO1: Speech/Audio Coding and Watermarking
Chair: Alfred Mertins, University of Oldenburg

PARAMETRIC AUDIO CODING BASED ON ADAPTIVE SIGNAL MODELS .................................. 1645
Pedro Vera-Candeas, Nicolas Ruiz-Reyes, Electronics Department, University of Jaen, Spain; Manuel Rosa-Zurera, Signal Theory and Communications Department, University of Alcal’a, Spain; Pedro Jesus Reche-Lopez and Juan Carlos Cuevas-Martinez, Electronics Department, University of Jaen, Spain

RD OPTIMAL TIME SEGMENTATIONS FOR THE TIME-VARYING MDCT .................................. 1649
Omar Niamut and Richard Heusdens, Delft University of Technology, The Netherlands

SPEECH WATERMARKING FOR AIR TRAFFIC CONTROL ............................................................ 1653
Martin Hagmüller, Graz University of Technology, Austria; Horst Hering, Eurocontrol Experimental Centre, France; Andreas Kröpfl, Frequentis Innovations Graz, Austria; and Gernot Kubin, Graz University of Technology, Austria

DATA EMBEDDING IN SPEECH SIGNALS USING PERCEPTUAL MASKING .............................. 1657
Ariel Sagi and David Malah, Technion, Israel

A NARROWBAND LOW BIT RATE SINUSOIDAL AUDIO AND SPEECH CODER ............................ 1661
Gerard Hotho and Rob Sluijter, Philips Research Laboratories Eindhoven, The Netherlands

FAST SPARSE SUBBAND DECOMPOSITION USING FIRSP ......................................................... 1665
Mike Davies, QMUL, UK; and Laurent Daudet, Laboratoire d’Acoustique Musicale, France

VERY LOW BIT RATE (VLBR) SPEECH CODING AROUND 500 BITS/SEC ................................. 1669
Marc Padellini, François Capman, Thales communications, France; and Geneviève Baudoin, ESIEE, France

THE SENSITIVITY MATRIX FOR A SPECTRO-TEMPORAL AUDITORY MODEL .......................... 1673
Jan H. Plasberg, David Y. Zhao and Bastiaan Kleijn, KTH (Royal Institute of Technology), Sweden

COMPANDED LATTICE VQ FOR EFFICIENT PARAMETRIC LPC QUANTIZATION ...................... 1677
Marie Oger, University of Sherbrooke, Canada; Stéphane Ragot, France Telecom R&D, France; and Roch Lefebvre, University of Sherbrooke, Canada
LOW-COST SMART TRANSCODING ALGORITHM BETWEEN ITU-T G.729 (8 KBIT/S) AND 3GPP NB-AMR (12.2 KBIT/S) ................................................................. 1681
Mohamed Ghenania and Claude Lamblin, France Telecom R&D, FRANCE

Session ThuPmPO2: Independent Component Analysis, Blind Source Separation, and Blind Deconvolution
Chair: Fabian Theis, University of Regensburg, Germany

ON-LINE MULTICHANNEL BLIND EQUALIZATION ALGORITHM WITH NONSTATIONARY SIGNALS. 1685
Shen Xizhong and Shi Xizhi, Shanghai Jiao Tong University, China

A SPEECH DEREVERBERATION METHOD BASED ON THE MTF CONCEPT USING ADAPTIVE TIME-FREQUENCY DIVISIONS .................................................. 1689
Masashi Unoki, Masato Toi and Masato Akagi, Japan Advanced Institute of Science and Technology, JAPAN

SEPARATION OF SPEECH SIGNALS UNDER REVERBERANT CONDITIONS ........................................ 1693
Christine Serviere, LIS, FRANCE

PROBABILISTIC BLIND DECONVOLUTION OF NON-STATIONARY SOURCES .......................... 1697
Rasmus Kongsgaard Olsson and Lars Kai Hansen, Informatics and Mathematical Modelling, Technical University of Denmark, Denmark

PENALTY FUNCTION BASED JOINT DIAGONALIZATION APPROACH FOR CONVOLUTIVE CONSTRAINED BSS OF NONSTATIONARY SIGNALS ................. 1701
Wenwu Wang, Jonathon Chambers, Cardiff University, U.K.; and Saeid Sanei, King’s College London, U.K.

UNIQUENESS OF REAL AND COMPLEX LINEAR INDEPENDENT COMPONENT ANALYSIS REVISITED ................................................................. 1705
Fabian Theis, Institute of Biophysics, University of Regensburg, Germany

EVALUATION OF BLIND SEPARATION AND DECONVOLUTION FOR BINAURAL-SOUND MIXTURES USING SIMO-MODEL-BASED ICA ...................... 1709
Hiroaki Yamajo, Hiroshi Saruwatari, Tomoya Takatani, Tsuyoki Nishikawa and Kiyohiro Shikano, Graduate School of Information Science, Nara Institute of Science and Technology, Japan

BAYESIAN SINGLE CHANNEL SPEECH ENHANCEMENT EXPLOITING SPARSENESS IN THE ICA DOMAIN ................................................................. 1713
Liang Hong, Siemens Corporate Research and Tennessee State University, USA; Justinian Rosca and Radu Balan, Siemens Corporate Research, USA

EXTENDED KALMAN FILTER IN BLIND SEPARATION OF NONSTATIONARY SIGNALS ............. 1717
Slavica Todorovic-Zarkula, Technical School Nis, Serbia; Branimir Todorovic, Miomir Stankovic, Faculty of Occupational Safety, Serbia; and Vlastimir Pavlovic, Faculty of Electronics, Serbia

Special Session ThuPmSS3: Affine Covariant Regions for Object Recognition, Image Retrieval and Stereo Vision
Chair: Jiri Matas, Czech Technical University Prague, Czech Republic

OBJECT RECOGNITION METHODS BASED ON TRANSFORMATION COVARIANT FEATURES........ 1721
Jiri Matas and Stepan Obdrzalek, Center for Machine Perception, Czech Technical University Prague, Czech Republic
SESSION THUPMOR4: SOURCE CODING AND DATA COMPRESSION

Chair: Bastiaan Kleijn, KTH (Royal Institute of Technology), Sweden

SUFFIX-CONSTRAINED CODES FOR PROGRESSIVE AND ROBUST DATA COMPRESSION: SELF-MULTIPLEXED CODES
Hervé Jégou and Christine Guillemot, IRISA/INRIA, France

ROBUST TRANSMISSION OF VARIABLE-LENGTH ENCODED MARKOV SOURCES USING RATE-1 CHANNEL CODING AND EFFICIENT ITERATIVE SOURCE-CHANNEL DECODING
Ragnar Thobaben and Jörg Kliewer, Institute for Circuits and Systems Theory, Faculty of Engineering, University of Kiel, Germany

DESIGN OF ASYMMETRICAL REVERSIBLE VARIABLE-LENGTH CODES AND THE COMPARISON OF THEIR ROBUSTNESSES
Wook-Hyun Jeong, Young-Suk Yoon and Yo-Sung Ho, Kwangju Institute of Science and Technology (K-JIST), Korea

SHANNON ENTROPY ESTIMATION BASED ON HIGH-RATE QUANTIZATION THEORY
Mattias Nilsson and Bastiaan Kleijn, KTH (Royal Institute of Technology), Sweden

HIGH RATE SPHERICAL QUANTIZATION OF SINUSOIDAL PARAMETERS
Pim Korten, Jesper Jensen and Richard Heusdens, Technical University of Delft, The Netherlands

SESSION THUPMOR5: AUGMENTED AND VIRTUAL 3D AUDIO

Chair: Walter Kellermann, University of Erlangen-Nuremberg, Germany

INTERPOLATION OF HEAD-RELATED TRANSFER FUNCTIONS (HRTFS): A MULTI-SOURCE APPROACH
Fábio Pacheco Freeland, LPS-PEE/COPPE/UF RJ, Brazil; Luiz Wagner Pereira Biscainho, LPS-DEL/POLI/UF RJ, Brazil; and Paulo Sergio Ramirez Diniz, LPS-PEE/COPPE/UF RJ, Brazil

ON-LINE ADAPTIVE ALGORITHM TO ACOUSTIC FLUCTUATION FOR INVERSE FILTER RELAXATION IN SOUND REPRODUCTION SYSTEM
Yosuke Tatekura, Shizuoka University, Japan; Shigefumi Urata, Hiroshi Saruwatari and Kiyohiro Shikano, Nara Institute of Science and Technology, Japan

ANALYSIS-SYNTHESIS OF IMPACT SOUNDS
Mitsuko Aramaki and Richard Kronland-Martinet, CNRS-LMA, France

FAST MODELING OF ACOUSTIC REFLECTIONS AND DIFFRACTION IN COMPLEX ENVIRONMENTS USING VISIBILITY DIAGRAMS
Fabio Antonacci, Marco Foco, Augusto Sarti and Stefano Tubaro, DEI - Politecnico di Milano, Italy
Session ThuPmOR6: Instantaneous Frequency and Nonstationary Spectral Estimation
Chair: Alfred Hanssen, University of Tromsø, Norway

OPTIMAL MULTIPLE WINDOW TIME-FREQUENCY ANALYSIS OF LOCALLY STATIONARY PROCESSES ................................................................. 1781
Maria Hansson and Patrik Wahlberg, Lund University, Sweden

ESTIMATION OF MULTICOMPONENT SIGNALS BY USING TIME-FREQUENCY REPRESENTATIONS WITH APPLICATION TO KNOCK SIGNAL ANALYSIS ........................................... 1785
Igor Djurovic, University of Montenegro, Electrical Engineering department, Serbia and Montenegro; Mark Urlaub, Signal Theory Group, Ruhr University Bochum, Germany; Ljubisa Stankovic, University of Montenegro, Electrical Engineering department, Serbia and Montenegro; and Johann Böhme, Signal Theory Group, Ruhr University Bochum, Germany

FRACTIONAL GABOR SPECTRAL ESTIMATION FOR MULTI-COMPONENT SIGNALS .......................................................... 1789
Erol Onen and Aydin Akan, Istanbul University, Turkey

IF ESTIMATION OF MULTICOMPONENT CHIRP SIGNAL IN IMPULSIVE ALPHA-STABLE NOISE ENVIRONMENT USING PARAMETRIC AND NON-PARAMETRIC APPROACHES ........................................... 1793
Mohamed Sahmoudi, LSS; CNRS-Supelec-UPS, France; Karim Abed-Meraim, TSI, Telecom Paris, France; and Braham Barkat, School of Elec & Electro. Eng., Singapore

EXPECTATION MAXIMIZATION (EM) ALGORITHM FOR INSTANTANEOUS FREQUENCY ESTIMATION WITH KALMAN SMOOTHER .......................................................... 1797
Md. Emityaz Khan and D. Narayana Dutt, Indian Institute of Science, Bangalore, India

Session ThuPmPO3: Adaptive Filters III
Chair: George Glentis, TEI of Crete, Branch at Chania

A NOVEL APPROACH FOR THE CONVERGENCE ANALYSIS OF THE LEAST-MEAN FOURTH ALGORITHM ................................................................. 1801
Azzedine Zerguine, KFUPM, Saudia Arabia

COEFFICIENT-DEPENDENT STEP-SIZE FOR ADAPTIVE SECOND-ORDER VOLterra FILTERS .......................................................... 1805
Fabian Küch and Walter Kellermann, University of Erlangen-Nuremberg, Germany

ANALYSIS OF EXPLICIT REGULARIZATION IN AFFINE PROJECTION ALGORITHMS: ROBUSTNESS AND OPTIMAL CHOICE ................................................................. 1809
Hernan Gonzalo Rey, Leonardo Rey Vega, Sara Tressens and Bruno Cernuschi Frias, Facultad de Ingenieria - Universidad de Buenos Aires, Argentina

AN APPROACH TO TRANSFORM DOMAIN VARIABLE STEP-SIZE LMS ADAPTIVE FILTER .......................................................... 1813
Bozo Krstajic, Darko Ojdanic, Aleksandar Vucinic, Zdravko Uskokovic and Ljubisa Stankovic, Department of Electrical Engineering, University of Montenegro, Serbia and Montenegro
THE AVERAGED, OVERDETERMINED AND GENERALISED LMS (AOGLMS) ALGORITHM
Enrique Alameda Hernandez, School of Electronic and Electrical Engineering, University of Leeds, United Kingdom; Diego P. Ruiz, Department of Applied Physics, University of Granada, Spain; David Blanco, School of Engineering and Electronics, The University of Edinburgh, United Kingdom; Desmond C. McLernon, School of Electronic and Electrical Engineering, University of Leeds, United Kingdom; and Maria C. Carrion, Department of Applied Physics, University of Granada, Spain

FRLS COMPLEX DECISION FEEDBACK ADAPTIVE CHANNEL EQUALIZER USING REAL VALUED ARITHMETIC
George Glentis, TEI of Crete, Branch at Chania, Dept. Electronics, Greece

SUBBAND ADAPTIVE FILTERING USING A MULTIPLE-CONSTRAINT OPTIMIZATION CRITERION
Kong-Aik Lee, Woon-Seng Gan and Yuan Wen, Nanyang Technological University, Singapore

MINIMUM BER DFE EQUALIZER IN ALPHA-STABLE NOISE
Vimal Bhatia, Bernard Mulgrew and Apostolos Georgiadis, The University of Edinburgh, United Kingdom

A STOCHASTIC MODEL FOR THE TRANSFORM-DOMAIN LMS ALGORITHM
Elen Lobato, Orlando Tobias and Rui Seara, LINSE - Federal University of Santa Catarina, Brazil

BAYESIAN ADAPTIVE FILTERING: PRINCIPLES AND PRACTICAL APPROACHES
Tayeb Sadiki and Dirk Slock, Eurecom Institute, France

Session ThuPmPO4: MIMO and Space-Time Communications
Chair: Wolfgang Utschick, Munich University of Technology

ON MULTI-MODULATION SCHEMES TO INCREASE THE RATE OF SPACE-TIME BLOCK CODES
Le Chung Tran, Tadeusz A. Wysocki, Jennifer Seberry, University of Wollongong, Australia; and Alfred Mertins, University of Oldenburg, Germany

AN MMSE INTERFERENCE ESTIMATOR FOR TURBO BLAST SYSTEMS
Yan Wu, Yuan Li and Sumei Sun, Institute for Infocomm Research, Singapore

PERFORMANCE OF FREQUENCY-DOMAIN MIMO EQUALIZATION FOR CYCLIC-PREFIXED SINGLE-CARRIER SPATIAL MULTIPLEXING
Mikel Mendicute, Jon Altuna, University of Mondragon, Spain; John Thompson, University of Edinburgh / Institute for Digital Communications, U.K.; and Vicente Atxa, University of Mondragon, Spain

AN ACCELERATED CONSTANT MODULUS ALGORITHM FOR SPACE-TIME BLIND EQUALIZATION
Magno Silva, Max Gerken, University of São Paulo, Brazil; and Maria Miranda, Mackenzie University, Brasil

PARAMETER ESTIMATION AND EQUALIZATION TECHNIQUES FOR MIMO FREQUENCY SELECTIVE CHANNELS WITH MULTIPLE FREQUENCY OFFSETS
Sajid Ahmed, Cardiff University, UK; Sangarapillai Lambotharan, Kings College London, UK; Andreas Jakobsson, Karlstad University, Sweden; and Jonathon Chambers, Cardiff University, UK

TRANSMIT DIVERSITY OVER FREQUENCY-SELECTIVE FADEING CHANNEL : A BLIND APPROACH
Sebastien Houcke and Ons Ben Rhouma, ENST-Bretagne CNRS FRE 2658, France

KALMAN-BASED ESTIMATION OF MEASURED CHANNELS IN MOBILE MIMO OFDM SYSTEM
Mihai Enescu, Timo Roman, Helsinki University of Technology, Finland; and Markus Herdin, Vienna University of Technology, Austria
FREQUENCY-DOMAIN CHANNEL ESTIMATION IN MIMO-OFDM
M. Julia Fernandez-Getino Garcia, Universidad Carlos III de Madrid, Spain; Ezio Biglieri and Giorgio Taricco, Politecnico di Torino, Italy

A DIVIDE-AND-CONQUER ALGORITHM FOR CHANNEL ESTIMATION IN MULTI-USER SPACE-TIME CODED TRANSMISSIONS
Waleed Younis and Ali Sayed, University of California at Los Angeles, USA

Friday, September 10th, 2004

Plenary Lecture FriAmPS1: Getting to Grips with 3D Modelling

GETTING TO GRIPS WITH 3D MODELING
Luc Van Gool, Thomas Koninckx and Tobias Jaeggl, Katholieke Universiteit Leuven, Belgium

Special Session FriAmSS1: Nonlinear Signal and Image Processing
Chaired by Stephen Marshall, University of Strathclyde, UK

NEW CHALLENGES IN NON-LINEAR SIGNAL AND IMAGE PROCESSING
Stephen Marshall, University of Strathclyde, UK; and Edward Dougherty, Texas A&M University, USA

NONLINEAR ACTIVE NOISE CONTROL
Giovanni Sicuranza and Alberto Carini, DEEI-University of Trieste, Italy

CHAOTIC WATERMARK SEQUENCES FOR CORRELATION-BASED SCHEMES
Anastasios Tefas, Nikos Nikolaidis and Ioannis Pitas, Department of Informatics, Aristotle University of Thessaloniki, Greece

GENERALIZED VECTOR MEDIANS FOR CORRELATED CHANNELS
Yinbo Li, Gonzalo Arce and Jan Bacca, Department of Electrical and Computer Engineering, University of Delaware, US

FINITE SET DSP, WITH APPLICATIONS TO DNA SEQUENCES
Ronald Pearson, Gregory Gonye, Thomas Jefferson University, USA; and Moncef Gabbouj, Tampere University of Technology, Finland

Session FriAmOR1: System Identification
Chaired by Maciej Niedzwiecki, Gdansk University of Technology, Poland

IDENTIFICATION OF PARAFAC-VOLTERRA CUBIC MODELS USING AN ALTERNATING RECURSIVE LEAST SQUARES ALGORITHM
Anis Khouaja and Gerard Favier, Laboratoire I3S (UNSA-CNRS), France

UNBIASED EQUATION-ERROR APPROACH FOR EFFICIENT IIR SYSTEM IDENTIFICATION
H. C. So, City University of Hong Kong, Hong Kong; Y. T. Chan, The Chinese University of Hong Kong, Hong Kong; K. C. Ho, University of Missouri-Columbia, USA; and K. W. Chan, City University of Hong Kong, Hong Kong

A VARIABLE STEP-SIZE APA ALGORITHM ROBUST UNDER IMPULSIVE NOISE INTERFERENCE
Bessem Sayadi, ENSEA-ETIS-UCP, FRANCE; and Sylvie Marcos, LSS-CNRS-SUPELEC, FRANCE
GENERALIZED ADAPTIVE NOTCH FILTERS FOR IDENTIFICATION OF REAL QUASI-PERIODICALLY VARYING SYSTEMS ................................................................. 1915
Maciej Niedzwiecki and Piotr Kaczmarek, Gdansk University of Technology, Poland

AN ALGEBRAIC IDENTIFICATION METHOD FOR THE DEMODULATION OF QPSK SIGNAL THROUGH A CONVOLUTIVE CHANNEL .................................... 1919
Aline Neves, Mamadou Mboup, UFR Math-Info, Univ Rene Descartes-Paris 5, France; and Michel Fliess, Laboratoire STIX, Ecole Polytechnique, France

Session FriAmOR2: xDSL and DMT Systems
Chair: Tomas Nordström, Telecommunications Research Center Vienna (ftw.)

BIT RATE MAXIMIZING WINDOW AND EQUALIZER DESIGN FOR DMT-SYSTEMS ................................................................. 1923
Geert Ysebaert, Koen Vanbleu, Gert Cuypers and Marc Moonen, Katholieke Universiteit Leuven, Belgium

ON TIME-DOMAIN AND FREQUENCY-DOMAIN MMSE-BASED TEQ DESIGNS FOR DMT TRANSMISSION ................................................................. 1927
Koen Vanbleu, Geert Ysebaert, Gert Cuypers and Marc Moonen, K.U. Leuven, ESAT/SCD, Belgium

ROBUST BLIND CHANNEL SHORTENING IN IMPULSIVE NOISE ENVIRONMENTS ................................................................. 1931
Rab Nawaz and Jonathon Chambers, Cardiff University, UK

A NEW TMUX FOR XDSL BASED ON LINEAR PHASE MODULATED FILTER BANKS ................................................................. 1935
Pawel Turcza, AGH University of Science and Technology, Poland

MOVING THE PAR REDUCTION CRITERION INTO THE LINE DRIVER ................................................................. 1939
Karl Werner, Dept. of Signals, Sensors and Systems, Royal Institute of Technology (KTH), Sweden; Niklas Larsson, Lund University, Sweden; Niklas Andgart, Thomas Magesacher, Signal Processing Group, Dept. of Information Technology, Lund University, Sweden; Tore Andre, Ericsson AB, Sweden; Torbjörn Randahl, Infineon Technologies, Sweden; and Per Ödling, Signal Processing Group, Dept. of Information Technology, Lund University, Sweden

Session FriAmOR3: Speech Enhancement and Restoration II
Chair: Gerhard Doblinger, Vienna University of Technology

RESTORATION OF THE VOICE TIMBRE IN TELEPHONE NETWORKS BASED ON BOTH VOICE AND LINE PROPERTIES ................................................................. 1943
Aline Neves, Gaël Mahé and Mamadou Mboup, Université René Descartes, France

INTERLEAVING AND ESTIMATION OF LOST VECTORS FOR ROBUST SPEECH RECOGNITION IN BURST-LIKE PACKET LOSS ................................................................. 1947
Alastair James and Ben Milner, University of East Anglia, UK

ROBUST SPECTRUM QUANTIZATION FOR LP PARAMETER ENHANCEMENT ................................................................. 1951
Volodya Grancharov, Sriram Srinivasan, Jonas Samuelsson and Bastiaan Kleijn, KTH (Royal Institute of Technology), Sweden

SPEECH ENHANCEMENT FOR A CAR ENVIRONMENT SUPPORT BY A FIRST-ORDER DIFFERENTIAL MICROPHONE ................................................................. 1955
Agustín Ivarez-Marquina, Pedro Gómez, Rafael Martínez-Olalla, Victoria Rodellar and Víctor Nieto-Lluis, Universidad Politécnica de Madrid, Spain
NOISE REDUCTION METHOD FOR WIDEBAND SPEECH CODING
Milan Jelinek, University of Sherbrooke, Canada; and Redwan Salami, VoiceAge corporation, Canada

Session FriAmOR4: Video Coding
Chair: Nathalie Laurent, France Telecom R&D, France

TRANSRATING OF MPEG-2 CODED VIDEO VIA REQUANTIZATION WITH OPTIMAL TRELLIS-BASED DCT COEFFICIENTS MODIFICATION
Michael Lavrentiev and David Malah, Electrical Engineering Department, Technion, Israel

LOSSLESS VIDEO CODING USING VARIABLE BLOCK-SIZE MC AND 3D PREDICTION OPTIMIZED FOR EACH FRAME
Ichiro Matsuda, Taichiro Shiodera and Susumu Itoh, Science University of Tokyo, JAPAN

CONSTANT BIT-RATE CONTROL EFFICIENCY WITH FAST MOTION ESTIMATION IN H.264/AVC VIDEO CODING STANDARD
Daniele Alfonso, Daniele Bagni, Luca Celetto, STMicroelectronics, Italy; and Simone Milani, University of Padova, Italy

MOTION-COMPENSATED LIFTED WAVELET VIDEO CODING: TOWARD OPTIMAL MOTION / TRANSFORM CONFIGURATION
Nikola Bozinovic, Janusz Konrad, Boston University, USA; Marc Antonini, Michael Barlaud and Thomas Andre, Universite de Nice, France

EFFICIENT SCALABLE MOTION CODING FOR WIDE-RANGE SCALABLE VIDEO COMPRESSION
Guillaume Boisson, Edouard Francois, THOMSON multimedia R&D France, FRANCE; and Christine Guillemot, IRISA, FRANCE

Session FriAmPOl: Loudspeaker and Microphone Array Signal Processing
Chair: Simon Doclo, KU Leuven, Belgium

A TRACKING ALGORITHM OF SPEAKER DIRECTION USING MICROPHONES LOCATED AT VERTICES OF EQUILATERAL-TRIANGLE
Yusuke Hioka and Nozomu Hamada, Keio University, Japan

THREE DIFFERENT RELIABILITY CRITERIA FOR TIME DELAY ESTIMATES
Dirk Bechler and Kristian Kroschel, University of Karlsruhe, Germany

UNDERDETERMINED BLIND SPEECH SEPARATION WITH DIRECTIVITY PATTERN BASED CONTINUOUS MASK AND ICA
Shoko Araki, Shoji Makino, Hiroshi Sawada and Ryo Mukai, NTT Corporation, Japan

LOUDSPEAKER EQUALIZATION BASED ON MULTI-LOCATION OBSERVATION WITH RELIABLE TIME-FREQUENCY REGION SELECTION AND ITS EVALUATION USING SOUND PROPAGATION MEASUREMENT
Masanori Morise and Hideki Kawahara, Wakayama University, Japan

AN APPROACH TO GLOBAL NOISE CONTROL BY WAVE FIELD SYNTHESIS
Achim Kuntz and Rudolf Rabenstein, University of Erlangen-Nuremberg, Germany
Session FriAmPO2: FPGA and SoC Realizations

Chair: Fabrizio Vacca, Politecnico di Torino, Italy

ON THE DESIGN AND FPGA IMPLEMENTATION OF REAL-TIME SCANNED-ARRAY 2D FREQUENCY-PLANAR BEAM FILTERS ................................................................. 2011
Arjuna Madanayake and Leonard Bruton, University of Calgary, Canada

DESIGN FLOW IMPROVEMENTS FOR EMBEDDED WIRELESS RECEIVERS ................................. 2015
Bastian Knerr, CD-Laboratory, INTHFT, TU Vienna, Austria; Pavle Belanovic, Martin Holzer, CD-Laboratory, INTHFT, TU Vienna, Austria; Guillaume Sauzon, Infineon Technologies SMS, Vienna, Austria; and Markus Rupp, INTHFT, TU Vienna, Austria

AN EFFICIENT FPGA IMPLEMENTATION OF A FLEXIBLE JPEG2000 DECODER FOR DIGITAL CINEMA 2019
Antonin Descampe, François Devaux, UCL - Communications and Remote Sensing Lab, Belgium; Gaël Rouvroy, UCL - Microelectronics Lab, Belgium; Benoît Macq, UCL - Communications and Remote Sensing Lab, Belgium; and Jean-Didier Legat, UCL - Microelectronics Lab, Belgium

AN ENERGY-EFFICIENT RECONFIGURABLE FFT/IFFT PROCESSOR BASED ON A MULTI-PROCESSOR RING ................................................................................................. 2023
Guichang Zhong, Fan Xu and Alan Jr Willson, University of California, Los Angeles, USA

EMBEDDING QUANTUM CRYPTOGRAPHY ON DSP-BOARDS .......................................................... 2027
Roland Lieger, Thomas Lorinser, Gerhard Humer and Florian Schupfer, ARC Seibersdorf research GmbH, Austria

A NEW VECTOR PROCESSOR ARCHITECTURE FOR HIGH PERFORMANCE SIGNAL PROCESSING ... 2031
Andreas Bolzer, Gerald Krottendorfer and Manfred Riener, On Demand Microelectronics, Austria

AN OPTIMISED SYSTOLIC ARRAY-BASED MATRIX INVERSION FOR RAPID PROTOTYPING OF KALMAN FILTERS IN FPGA'S .................................................... 2035
Yat Tin Lai, Abbas Bigdeli and Morteza Biglari-Abhari, The University of Auckland, New Zealand

ARCHITECTURE DESIGN FOR FPGA IMPLEMENTATION OF FINITE INTERVAL CMA .................. 2039
Antonin Hermanek, Jan Schier, UTIA AV CR, Czech Republic; and Phillip Regalia, INT-Evry, France

AUDIO-VIDEO TERMINAL SYSTEM-ON-CHIP SIMULATION ............................................................ 2043
Ivano Barbieri, Massimo Bariani, Marco Raggio and Alessandro Scotto, DIBE University of Genova, ITALY

EXPLORING JPEG-2000 ENTROPY CODER IMPLEMENTATIONS ON XILINX VIRTEX-II PRO PLATFORMS ............................................................... 2047
Omar Hammami, Riad Benmouhoub and Imed Aouadi, ENSTA, FRANCE
Special Session FriAmSS2: Nonlinear Speech Processing
Chair: Marcos Faundez-Zanuy, EUP Mataro, Spain

SPEAKER RECOGNITION IMPROVEMENT USING BLIND INVERSION OF DISTORTIONS 2051
Marcos Faundez-Zanuy, EUP Mataro, SPAIN; and Jordi Sole-Casals, Universitat de Vic, SPAIN

NONLINEAR PREDICTIVE ANALYSIS OF SPEECH BY ITERATIVE APPROACH 2055
Hirobumi Tanaka and Tetsuya Shimamura, Graduate School of Science and Engineering, Saitama Univ., Japan

LEARNING VECTOR QUANTIZATION AND NEURAL PREDICTIVE CODING FOR NONLINEAR SPEECH FEATURE EXTRACTION 2059
Mohamed Chetouani, Bruno Gas and Jean-Luc Zarader, Laboratoire des Instruments et Systèmes-d’Ile-De-France, France

A BIO-INSPIRED SOUND SOURCE SEPARATION TECHNIQUE IN COMBINATION WITH AN ENHANCED FIR GAMMATONE ANALYSIS/SYNTHESIS FILTERBANK 2063
Ramin Pichevar, Jean Rouat, University of Sherbrooke, Canada; Christian Feldbauer and Gernot Kubin, Graz University of Technology, Austria

SVM CLASSIFIERS FOR ASR: A DISCUSSION ABOUT PARAMETERIZATION 2067
Jose Miguel Garcia-Cabellos, Carmen Pelaez-Moreno, Ascension Gallardo-Antolin, Fernando Perez-Cruz and Fernando Diaz-de-Maria, Universidad Carlos III de Madrid, Spain

Session FriAmOR5: OFDM and MC-CDMA Systems
Chair: Lajos Hanzo, University of Southampton, UK

LINEAR OFDM PRECODER DESIGN FOR MULTIUSER WIRELESS COMMUNICATIONS USING CUTOFF RATE OPTIMIZATION 2071
Yue Rong, Sergiy Vorobyov and Alex Gershman, Department of Communication Systems, University of Duisburg-Essen, Germany

DOPPLER DIVERSITY IN MC-CDMA USING THE SLEPIAN BASIS EXPANSION MODEL 2075
Thomas Zemen and Christoph Mecklenbräuker, ftw. Forschungszentrum Telekommunikation Wien, Austria

SEMI-BLIND CHANNEL ESTIMATION FOR OFDM SYSTEMS VIA AN EM-BLOCK ALGORITHM 2079
Touati Sami, Mamfoumbi Octoo Jean-Marc, Alberge Florence and Duhamel Pierre, LSS, France

STATISTICAL MODELING OF BIT-ERROR-RATES IN ASYNCHRONOUS MULTICARRIER CDMA AND DIRECT-SEQUENCE CDMA SYSTEMS 2083
Daniel Carey, Bouchra Senadjii, Queensland University of Technology, Australia; and Daniel Roviras, INPT/ENSEEIHT, France

ITERATIVE DEMODULATION OF ZERO-PADDED OFDM WITH MMSE EQUALIZATION USING A PRIORI INFORMATION 2087
Stephan Pfletschinger, CTTC, Spain

Session FriAmOR6: Generic Audio Recognition
Chair: Asoke K. Nandi, University of Liverpool

ROBUST AUDIO HASHING FOR CONTENT IDENTIFICATION 2091
Hanza Özer, Bogazici University/TUBÝTAK, Turkey; Bülent Sankur, Bogazici University, Turkey; and Nasir Memon, Polytechnic University, USA
Session FriAmOR7: Image Representation and Modelling
Chair: Patrizio Campisi, Università degli Studi di Roma, Italy

TWO-DIMENSIONAL AUTOREGRESSIVE MODELLING USING JOINT SECOND AND THIRD ORDER STATISTICS AND A WEIGHTING SCHEME
Sarah Lee and Tania Stathaki, Communications and Signal Processing Research Group, Department of Electrical and Electronic Engineering, Imperial College London, UK

NONPARAMETRIC APPROACH TO COLOR BASED IMAGE RETRIEVAL
Bogdan Smolka, Silesian University of Technology, Poland; Anastasios Venetsanopoulos, Rastislav Lukac and Konstantinos Plataniotis, University of Toronto, Canada

MIXTURE MODEL BASED IMAGE SEGMENTATION WITH SPATIAL CONSTRAINTS
Konstantinos Blekas, Aristidis Likas, Nikolas Galatsanos and Isaak Lagaris, Computer Science Department, University of Ioannina, Greece

A PSYCHOVISUAL COLOR IMAGE QUALITY METRIC INTEGRATING BOTH INTRA AND INTER CHANNEL MASKING EFFECT
Christophe Charrier, University of Caen Basse-Normandie, LUSAC EA 2607, VIA Group, France; and Thierry Eude, University Laval, LSVN, Canada

TREE CROWN EXTRACTION USING MARKED POINT PROCESSES
Guillaume Perrin, Xavier Descombes and Josiane Zerubia, Ariana Research Group, France

Session FriAmOR8: Radar and Sonar
Chair: Bernard Mulgrew, University of Edinburgh, United Kingdom

BEAM DESIGN FOR A PING-PONG-SAMPLED LINEAR RECEIVE ARRAY
Jeffrey Coleman and Dan Scholnik, Naval Research Laboratory, USA

NEW VERSION OF A MCMC DATA ASSOCIATION ALGORITHM FOR NON-LINEAR OBSERVATION - APPLICATION TO THE TRACKING PROBLEM WITH FRENCH OTH RADAR
David Bourgeois, Christèle Morisseau and Marc Flécheux, ONERA, FRANCE
AUTOMATIC RADAR TARGET RECOGNITION USING SUPERRESOLUTION MUSIC 2D IMAGES AND SELF-ORGANIZING NEURAL NETWORK .......................... Emanuel Radoi, Andre Quinquis, Felix Totir and Fabrice Pellen, ENSIETA, France

CONSTANT FALSE ALARM RATE DETECTION IN SPHERICALLY INVARIANT RANDOM PROCESSES Frédéric Pascal, ONERA-GEA-ENS Cachan, France; Jean-Philippe Ovarlez, ONERA, France; Philippe Forster, GEA, France; and Pascal Larzabal, ENS Cachan, France

SOURCE DEPTH ESTIMATION USING MODAL DECOMPOSITION AND FREQUENCY-WAVENUMBER TRANSFORM ............................................................... Barbara Nicolas, Jérôme Mars and Jean-Louis Lacoume, Laboratoire des images et signaux, France

Session FriAmPO3: Spectrum, Frequency, and DOA Estimation
Chair: Andreas Jakobsson, Karlstad University, Sweden

HARMONIC RETRIEVAL IN NON-CIRCULAR COMPLEX-VALUED MULTIPLICATIVE NOISE: BARANKIN BOUND Philippe Ciblat, Ecole Nationale Supérieure des Télécommunications, France; Philippe Forster, Université Paris X- Nanterre, France; and Pascal Larzabal, Ecole Normale Supérieure de Cachan, France

UNITARY CYCLIC MUSIC ALGORITHM IN A MULTIPATH ENVIRONMENT ................................................................. Zhigang Liu and Jinkuan Wang, Northeastern University, China

AUTOREGRESSIVE ORDER SELECTION IN MISSING DATA PROBLEMS ........................................................ Piet M.T. Broersen and Robert Bos, Delft University, The Netherlands

A NEW EXPRESSION OF THE ASYMPTOTIC PERFORMANCES OF MAXIMUM LIKELIHOOD DOA ESTIMATION METHOD WITH MODELING ERRORS Anne Ferreol, THALES Communication, FRANCE; Pascal Larzabal, SATIE ENS-CACHAN, FRANCE; and Mats Viberg, Chalmers University of Technology, SWEDEN

LOCALIZATION OF MULTIPLE MOVING SOURCES USING RECURSIVE EM .................................................... Pei-Jung Chung, Department of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, USA; and Johann Böhme, Department of Electrical Engineering, Ruhr-Universität Bochum, Germany

AN ADAPTED FILTER BANK FOR FREQUENCY ESTIMATION ...................................................................................... El-Hadi Djermoune and Marc Tomczak, Centre de Recherche en Automatique de Nancy - CRAN UMR CNRS 7039, France

COMPUTATIONALLY EFFICIENT SUBSPACE-BASED METHOD FOR DIRECTION ESTIMATION AND TRACKING IN ARRAY PROCESSING ................................................................. Jingmin Xin, Yoji Ohashi, Fujitsu Laboratories Ltd., Japan; and Akira Sano, Keio University, Japan

JOINT ANGLE/DELAY/POLARIZATION ESTIMATION BY ESPRIT-LIKE METHOD FOR MULTIPATH CHANNEL IDENTIFICATION ........................................................................... José Picheral and Francisco Piquéres, Supélec, France
Session FriAmPO4: Biomedical Signal Processing
Chair: Denis Kouame, LUSSI CNRS FRE 2448, FRANCE

CLUSTERING MICROARRAY DATA USING THE SELF ORGANISING OSCILLATOR NETWORK
Lindsay Jack, Department EEE, University of Liverpool, UK; and Asoke Nandi, Department EEE, University of Liverpool, UK

NEARLY PERFECT RECONSTRUCTION COSINE-MODULATED FILTER BANK APPLIED TO ECG SIGNAL CODING
Fernando Cruz-Roldán, Manuel Blanco-Velasco and Juan Ignacio Godino, Dep. de Teoría de la Señal y Comunicaciones, Universidad de Alcalá, Spain

STATISTICAL VARIABILITY OF AUDITORY RESPONSES TO AMPLITUDE MODULATION
Boris Gourevitch, Régine Le Bouquin Jeannès and Gérard Faucon, LTSI, INSERM, Université de Rennes 1, France

MATHEMATIC MORPHOLOGY APPROACH FOR RENAL BIOPSY ANALYSIS
Ferran Marques, Antoni Gasull, Gemma Cuberas, UPC, Spain; Daniel Seron, Francesc Moreso, CSUB, Spain; and Nayana Joshi, HUVH, Spain

ROBUST DETECTION OF QRS COMPLEX USING KLAUDER WAVELETS
Philippe Ravier, Laboratoire d'électronique, Signaux, Images - Orléans University, France; and Olivier Buttelli, Laboratoire de la Performance Motrice, AMCO group, Orléans University, France

REMOVAL OF CPR ARTIFACTS IN VENTRICULAR FIBRILLATION ECG BY LOCAL COHERENT LINE REMOVAL
Andreas Klotz, Dep. of Math., Univ. of Vienna, Austria; Anton Amann, Dep. of Anesthesiology, Med. Univ. Innsbruck, Austria; and Hans G. Feichtinger, Dep. of Math., Univ. of Vienna, Austria

NEWBORN EEG SEIZURE DETECTION USING SIGNAL STRUCTURAL COMPLEXITY
Luke Rankine, Mostefa Mesbah and Boualem Boashash, Signal Processing Research, Queensland University of Technology, Australia

STATISTICAL AND NEURO-FUZZY APPROACHES FOR EMBOLI DETECTION
Denis Kouame, Mathieu Biard, Jean-Marc Girault, Aurore Bleuzen, François Tranquart and Frédéric Patat, LUSSI CNRS FRE 2448, France

ANALYTIC WAVELETS APPLIED FOR THE DETECTION OF MICROCALCIFICATIONS. A TOOL FOR DIGITAL MAMMOGRAPHY
Silvio Montrésor, LAUM CNRS 6613, France; Maria Lado, Pablo Tahoces, Miguel Souto and Juan Vidal, LIIR, Spain

Special Session FriPmSS1: DSP Applications in Advanced Radio Communications Receiver Design
Chair: Peter Grant, University of Edinburgh, UK

ADVANCED DSP FOR IMPROVED WIRELESS ACCESS IN MOBILE COMMUNICATIONS
Peter Grant, John Thompson, Yeonwoo Lee, Chia Chong, Su Yong, University of Edinburgh, UK; and Emad Alsus, UMIST, UK

INFINITE LENGTH CHANNEL SHORTENING FILTERING BASED ON POLYNOMIAL APPROACH
Cenk Toker, Sangarapillai Lambotharan, CDSPR, King’s College London, United Kingdom; and Jonathon Chambers, Cardiff University, United Kingdom
ON THE ESTIMATION OF RAPIDLY TIME-VARYING CHANNELS
Geert Leus, Delft University of Technology, The Netherlands

JOINT ITERATIVE-DETECTION OF REVERSIBLE VARIABLE-LENGTH CODED CONSTANT BIT RATE VECTOR-QUANTIZED VIDEO AND CODED MODULATION
Lajos Hanzo, University of Southampton, UK

BLIND MULTI-USER EQUALISATION FOR A DISPERSIVE DS-CDMA DOWNLINK UNDER CARRIER FREQUENCY OFFSET CONDITIONS
Stephan Weiss, Mahmoud Hadeif, University of Southampton, UK; and Markus Rupp, Technical University of Vienna, Austria

Session FriPmOR1: Array Processing
Chair: Antonio Cantoni, Western Australian Telecommunications Research Institute, Australia

ON THE DESIGN OF ONE-DIMENSIONAL SPARSE ARRAYS WITH APODIZED END ELEMENTS
Sanjit Mitra, University of California, Santa Barbara, USA; Gordana Jovanovic-Dolecek, INAOE, Mexico; and Mikhail Tchobanou, Moscow Power Engineering Institute, Russia

DISTRIBUTED ARRAY OF SYNCHRONIZED SENSORS AND ACTUATORS
Dmitry Budnikov, Igor Chikalov, Igor Kozintsev and Rainer Lienhart, Intel Labs, Intel Corp., USA

NON ASYMPTOTIC EFFICIENCY OF A MAXIMUM LIKELIHOOD ESTIMATOR AT FINITE NUMBER OF SAMPLES
Alexandre Renaux, SATIE UMR 8029, FRANCE; Philippe Förster, GEA IUT de Ville d’Avray, FRANCE; and Eric Boyer, SATIE UMR 8029, FRANCE

EXTENSION AND EVALUATION OF MDS FOR GEOMETRIC MICROPHONE ARRAY CALIBRATION
Amaranag Subramanya and Stan Birchfield, Clemson University, USA

GENERALIZED STOCHASTIC PRINCIPLE FOR MICROPHONE ARRAY SPEECH ENHANCEMENT AND APPLICATIONS TO CAR ENVIRONMENTS
Radu Balan, Justinian Rosca, Siemens Corporate Research, USA; Christophe Beauregard, Virginie Gilg and Tim Fingscheidt, Siemens AG, Germany

Session FriPmOR2: Sinusoidal Models for Music and Speech
Chair: Richard Heusdens, Technical University of Delft, The Netherlands

MODELLING OF VIBRATO PRODUCTION
Ixone Arroabarren and Alfonso Carlesena, Universidad Publica de Navarra, SPAIN

PRECISE RECONSTRUCTION OF THE MUCOSAL WAVE FOR VOICE PATHOLOGY DETECTION AND CHARACTERIZATION
Pedro Gómez, Francisco Díaz, Rafael Martínez, Juan Ignacio Godino, Agustín Ivarez, Francisco Rodríguez and Victoria Rodellar, Universidad Politécnica de Madrid, victoria@pino.datsi.fi.upm.es

A MULTI-RESOLUTION SINUSOIDAL MODEL USING ADAPTIVE ANALYSIS FRAME
Ki-Hong Kim and In-Ho Hwang, National Security Research Institute, South Korea

AN EFFICIENT TWO-STAGE IMPLEMENTATION OF HARMONIC MATCHING PURSUIT
Chris Duxbury, Nicolas Chetry, Mark Sandler and Mike Davies, Queen Mary University of London, UK
Session FriPmOR3: Recognizing Faces
Chair: Constantine Kotropoulos, Aristotle University of Thessaloniki, Greece

AN EDGE-BASED FACE DETECTION ALGORITHM ROBUST AGAINST ILLUMINATION, FOCUS, AND SCALE VARIATIONS ................................................................. 2279
Yasufumi Suzuki and Tadashi Shibata, The University of Tokyo, Japan

PERSONAL IDENTIFICATION BY MULTITRESOLUTION ANALYSIS OF LIFTING DYADIC WAVELETS .. 2283
Shigeru Takano, Koichi Niijima, Department of Informatics, Kyushu University, Japan; and Koichi Kuzume, Department of Information Engineering, Yuge National College of Technology, Japan

ROBUST SCORE NORMALIZATION FOR RELATIONAL APPROACHES TO FACE AUTHENTICATION .. 2287
Florent Perronnin and Jean-Luc Dugelay, Institut Eurecom, France

DESIGN OF CODED STRUCTURED LIGHT PATTERN FOR 3D FACIAL SURFACE CAPTURE .......... 2291
Charles Beumier, Royal Military Academy, Belgium

Session FriPmOR4: Video Indexing and Content Access
Chair: Walter Kropatsch, Vienna University of Technology

ROBUST VIDEO HASH EXTRACTION ................................................................. 2295
Baris Coskun and Bülent Sankur, Bogazici University, Turkey

AUDIO CLIP CLASSIFICATION USING LP RESIDUAL AND NEURAL NETWORKS MODELS ............. 2299
Anvita Bajpai and B. Yegnanarayana, Indian Institute of Technology Madras, India

VIDEO KEY FRAME SELECTION BY CLUSTERING WAVELET COEFFICIENTS .......................... 2303
Satoshi Hasebe, Makoto Nagumo, Shogo Muramatsu and Hisakazu Kikuchi, Niigata University, Japan

A SIMILARITY MEASURE FOR COLOR IMAGE RETRIEVAL AND INDEXING BASED ON THE MULTIVARIATE TWO SAMPLE PROBLEM .............................................. 2307
Christos Theoharatos, Nikolaos Laskaris, George Economou and Spiros Fotopoulos, University of Patras, Greece

Author Index .............................................................................................................. xxiii