

# Table of Contents

## Tutorial

<b>SPEECHFIND: Spoken Document Retrieval for a National Gallery of the Spoken Word .....</b>	<b>1</b>
<i>Hansen, John, HL</i> , University of Colorado, USA	
<i>Huang, Rongqing</i> , University of Colorado, USA	
<i>Mangalath, Praful</i> , University of Colorado, USA	
<i>Zhou, Bowen</i> , University of Colorado, USA	
<i>Seadle, Michael</i> , Michigan State University, USA	
<i>Deller, John, R, Jr</i> , Michigan State University, USA	

## Medical Image Processing I

<b>Automatic Registration of Spectrophotometric Retinal Images .....</b>	<b>5</b>
<i>Halldorsson, Gisli, H</i> , University of Iceland, Iceland	
<i>Benediktsson, Jon, A</i> , University of Iceland, Iceland	
<i>Zoega, Gunnar, M</i> , University Hospital of Iceland, Iceland	
<i>Eysteinsson, Thor</i> , University of Iceland, Iceland	
<i>Stefansson, Einar</i> , University Hospital of Iceland, Iceland	
<b>Color Enhancement and Edge Detection for Confocal Microscopy Fluorescent Images .....</b>	<b>9</b>
<i>Albán, Edisson, R</i> , Tampere University of Technology, Finland	
<i>Leveelahti, Lotta</i> , University of Turku, Finland	
<i>Heiskanen, Kaisa, M</i> , University of Turku, Finland	
<i>Ruotsalainen, Ulla</i> , Tampere University of Technology, Finland	
<b>Image Processing Verification Tool-IPVT .....</b>	<b>13</b>
<i>Heric, Dusan</i> , University of Maribor, Slovenia	
<i>Potocnik, Bozidar</i> , University of Maribor, Slovenia	
<b>Surface Smoothing Based on a Sphere Shape Model .....</b>	<b>17</b>
<i>Tohka, Jussi</i> , Tampere University of Technology, Finland	

## Filters and Filter Design I

<b>Properties of the Multiplicative General Parameter Adaptive Algorithm .....</b>	<b>21</b>
<i>Vainio, Olli</i> , Tampere University of Technology, Finland	
<i>Ovaska, Seppo, J</i> , Helsinki University of Technology, Finland	
<b>Designing Multiplicative General Parameter Filters Using Multipopulation Genetic Algorithm .....</b>	<b>25</b>
<i>Martikainen, Jarno</i> , Helsinki University of Technology, Finland	
<i>Ovaska, Seppo, J</i> , Helsinki University of Technology, Finland	
<b>Design of Minimum Phase Digital IIR Filters by Using Genetic Algorithm .....</b>	<b>29</b>
<i>Karaboga, Nurhan</i> , Erciyes University, Turkey	
<i>Cetinkaya, Bahadir</i> , Erciyes University, Turkey	
<b>Least Squares Optimization of 2-D IIR Filters .....</b>	<b>33</b>
<i>Dumitrescu, Bogdan</i> , Tampere University of Technology, Finland	

# Nonlinear Signal Processing

<b>MLP and SVM Networks – a Comparative Study .....</b>	<b>37</b>
<i>Osowski, Stanislaw</i> , Warsaw University of Technology, and Military University of Technology, Poland	
<i>Siwek, Krzysztof</i> , Warsaw University of Technology, Poland	
<i>Markiewicz, Tomasz</i> , Warsaw University of Technology, Poland	
<b>Management of Uncertainty within Estimation in Dynamical Context, Application to MEMS .....</b>	<b>41</b>
<i>Baili, Hana</i> , École Supérieure d'Électricité, France	
<i>Juillard, Jérôme</i> , École Supérieure d'Électricité, France	
<b>An Extension of Bussgang's Theory to Complex-Valued Signals .....</b>	<b>45</b>
<i>Ermolova, Natalia, Y</i> , Helsinki University of Technology, Finland	
<i>Häggman, Sven-Gustav</i> , Helsinki University of Technology, Finland	

# Filters and Filter Design II

<b>Comparison of Continuous- and Discrete-Time Modelling of Polynomial-Based Interpolation Filters .....</b>	<b>49</b>
<i>Lehtinen, Vesa</i> , Tampere University of Technology, Finland	
<i>Babic, Djordje</i> , Tampere University of Technology, Finland	
<i>Renfors, Markku</i> , Tampere University of Technology, Finland	
<b>On the Use of Multiple Constant Multiplication in Polyphase FIR Filters and Filter Banks .....</b>	<b>53</b>
<i>Gustafsson, Oscar</i> , Linköping University, Sweden	
<i>Dempster, Andrew, G</i> , University of Westminster, United Kingdom	
<b>Kernel Using Piecewise nth Polynomials for Rate Converter .....</b>	<b>57</b>
<i>Mori, Yukio</i> , Salesian Polytechnic, Japan	
<i>Aikawa, Naoyuki</i> , Nihon University, Japan	

# Medical Image Processing II

<b>Evaluation of Noise in DNA Fingerprint Images Produced by Hybridization Techniques .....</b>	<b>61</b>
<i>Akbari, A</i> , University of Oslo, Norway	
<i>Albregtsen, F</i> , University of Oslo, Norway	
<b>Compression Gains in 2D MRCP Biliary Tree Modeling .....</b>	<b>65</b>
<i>Logeswaran, Rajasvaran</i> , Multimedia University, Malaysia	
<b>Bone Segmentation WA-algorithm .....</b>	<b>69</b>
<i>Heric, Dusan</i> , University of Maribor, Slovenia	
<i>Potocnik, Bozidar</i> , University of Maribor, Slovenia	
<b>Comparison of Pattern Classification Methods in Segmentation of Dynamic PET Brain Images .....</b>	<b>73</b>
<i>Koivistoinen, Heidi</i> , Tampere University of Technology, Finland	
<i>Tohka, Jussi</i> , Tampere University of Technology, Finland	
<i>Ruotsalainen, Ulla</i> , Tampere University of Technology, Finland	
<b>Noise Models for Sinusoidal Trajectories Composing Sinogram Data in Positron Emission Tomography .....</b>	<b>77</b>
<i>Krestyannikov, Evgeny</i> , Tampere University of Technology, Finland	
<i>Happonen, Antti</i> , Tampere University of Technology, Finland	
<i>Ruotsalainen, Ulla</i> , Tampere University of Technology, Finland	

# Wavelets and Filter Banks

<b>General Formulation for Arbitrary Length Cosine Modulated Filter Banks .....</b>	<b>81</b>
<i>Thomas, Tigi, K</i> , National Institute of Technology, India	
<i>Hameed, Abdul</i> , National Institute of Technology, India	
<i>Elias, Elizabeth</i> , National Institute of Technology, India	
<b>Shift Variance and Cyclostationarity in Multirate Filter Banks .....</b>	<b>85</b>
<i>Aach, Til</i> , University of Lübeck, Germany	
<b>Measuring Shiftability of Frames of Regular Translates .....</b>	<b>89</b>
<i>Sampo, J</i> , Lappeenranta University of Technology, Finland	
<i>Kamarainen, J-K</i> , Lappeenranta University of Technology, Finland	
<i>Heiliö, M</i> , Lappeenranta University of Technology, Finland	
<i>Kälviäinen, H</i> , Lappeenranta University of Technology, Finland	
<b>2D Wavelet Transforms with a Spatially Adaptive 2D Low Pass Filter .....</b>	<b>93</b>
<i>Abhayaratne, GCK</i> , Queen Mary, University of London, United Kingdom	
<b>Wavelet-Packet Subband Structures in the Evolution of the JPEG 2000 Standard .....</b>	<b>97</b>
<i>Reisecker, Markus</i> , Salzburg University, Austria	
<i>Uhl, Andreas</i> , Salzburg University, Austria	

# Image Processing I: Compression, Noise Reduction, and Authentication

<b>Predictive Differential Modulation for CFA Compression .....</b>	<b>101</b>
<i>Bruna, Arcangelo, R</i> , STMicroelectronics, Italy	
<i>Vella, Filippo</i> , STMicroelectronics, Italy	
<i>Buemi, Antonio</i> , STMicroelectronics, Italy	
<i>Curti, Salvatore</i> , STMicroelectronics, Italy	
<b>Support Vector Machines and Quad-Trees Applied to Image Compression .....</b>	<b>105</b>
<i>Saavedra, Ernesto</i> , University of Applied Sciences South Westphalia - Soest Campus, Germany	
<i>Grauel, Adolf</i> , University of Applied Sciences South Westphalia - Soest Campus, Germany	
<i>Morton, Danny</i> , Bolton Institute of Higher Education, England	
<b>Joint Gaussian Noise Reduction and Defects Correction in Raw Digital Images .....</b>	<b>109</b>
<i>Bosco, Angelo</i> , STMicroelectronics, Italy	
<i>Bruna, Arcangelo</i> , STMicroelectronics, Italy	
<i>Santoro, Gaetano</i> , STMicroelectronics, Italy	
<i>Vivirito, Paolo</i> , STMicroelectronics, Italy	
<b>Image Denoising by Combined Quincunx and Separable Wavelet-Domain Wiener Filtering .....</b>	<b>113</b>
<i>Vrankic, Miroslav</i> , University of Zagreb, Croatia	
<i>Egiazarian, Karen</i> , Tampere University of Technology, Finland	
<i>Gotchev, Atanas</i> , Tampere University of Technology, Finland	
<b>Time Invariant Curvelet Denoising .....</b>	<b>117</b>
<i>Saevarsson, Birgir, B</i> , University of Iceland, Iceland	
<i>Sveinsson, Johannes, R</i> , University of Iceland, Iceland	
<i>Benediktsson, Jon, A</i> , University of Iceland, Iceland	
<b>Robust Authentication of the JPEG 2000 Bitstream .....</b>	<b>121</b>
<i>Norcen, Roland</i> , Salzburg University, Austria	
<i>Uhl, Andreas</i> , Salzburg University, Austria	

## VLSI for Signal Processing

<b>Implementation of Bit-Level Pipelined Digit-Serial Multipliers .....</b>	<b>125</b>
<i>Landernäs, Krister</i> , Mälardalen University, Sweden	
<i>Holmberg, Johnny</i> , Mälardalen University, Sweden	
<i>Gustafsson, Oscar</i> , Linköping University, Sweden	
<b>Pipelining of Digit-Serial Processing Elements in Recursive Digital Filters .....</b>	<b>129</b>
<i>Karlsson, Magnus</i> , University of Kalmar, Sweden	
<i>Vesterbacka, Mark</i> , Linköping University, Sweden	
<i>Kulesza, Wlodek</i> , University of Kalmar, Sweden	
<b>Deep Sub-Micron Bus Invert Coding .....</b>	<b>133</b>
<i>Lindkvist, Tina</i> , Linköpings Universitet, Sweden	
<i>Löfvenberg, Jacob</i> , Linköpings Universitet, Sweden	
<i>Gustafsson, Oscar</i> , Linköpings Universitet, Sweden	
<b>A Dynamic Element Matching Technique for Flash Analog-to-Digital Converters .....</b>	<b>137</b>
<i>Säll, Erik</i> , Linköping University, Sweden	
<i>Andersson, Ola, K</i> , Linköping University, Sweden	
<i>Vesterbacka, Mark</i> , Linköping University, Sweden	
<b>Low-Complexity Constant Coefficient Matrix Multiplication Using a Minimum Spanning Tree Approach .....</b>	<b>141</b>
<i>Gustafsson, Oscar</i> , Linköping University, Sweden	
<i>Ohlsson, Henrik</i> , Linköping University, Sweden	
<i>Wanhammar, Lars</i> , Linköping University, Sweden	

## Biomedical Signal Measurement and Analysis I

<b>Multifrequency Bio-Impedance Measurement: Undersampling Approach .....</b>	<b>145</b>
<i>Märtens, Olev</i> , Tallinn Technical University, Estonia	
<i>Min, Mart</i> , Tallinn Technical University, Estonia	
<b>Minimum Spanning Tree Clustering of EEG Signals .....</b>	<b>149</b>
<i>Päävinen, Niina</i> , University of Kuopio, Finland	
<i>Grönfors, Tapio</i> , University of Kuopio, Finland	
<b>Independent Component Analysis Applied to Multielectrode Field Potential Measurements .....</b>	<b>153</b>
<i>Tanskanen, Jarno, MA</i> , University of Kuopio, Finland	
<i>Mikkonen, Jarno, E</i> , University of Kuopio, Finland	
<i>Penttonen, Markku</i> , University of Kuopio, Finland	
<b>Disease Detection Technique Using the Principal Orthogonal Decomposition on DNA Microarray Data .....</b>	<b>157</b>
<i>Peterson, David</i> , California State University, USA	
<i>Lee, Charles, H</i> , California State University, USA	

## Communications I: Coding and Detection

<b>Multi-Weight Multi-Length Strict Optical Orthogonal Codes .....</b>	<b>161</b>
<i>Tarhuni, Naser, G</i> , Helsinki University of Technology, Finland	
<i>Korhonen, Timo, O</i> , Helsinki University of Technology, Finland	
<b>Decoding of Punctured Turbo Codes Using Dual Codes .....</b>	<b>165</b>
<i>Ruttik, Kalle</i> , Helsinki University of Technology, Finland	

<b>Receiver Concepts for Differential Space-Time Modulation Schemes over Flat Time-Varying Channels .....</b>	169
<i>Chen, Xiao-Ming</i> , University of Kiel, Germany	
<i>Hoeher, Peter, A</i> , University of Kiel, Germany	

<b>Soft Output Detection Using Path Detector for Multiple Antennas .....</b>	173
<i>Ramirez, Enrique</i> , Helsinki University of Technology, Finland	
<i>Nefedov, Nikolai</i> , Nokia Research Center, and Helsinki University of Technology, Finland	

## Biomedical Signal Measurement and Analysis II

<b>Lightweight Embedded System for Acquiring Simultaneous Electromyogenic Activity and Movement Data (Function-EMG) .....</b>	177
---	-----

*Sihvonen, Teuvo*, Kuopio University Hospital & Mikkeli Central Hospital, Finland  
*Sihvonen, Pekka*, Savonia Polytechnic, Finland  
*Kuusrainen, Sami*, Savonia Polytechnic, Finland  
*Grönfors, Tapio*, University of Kuopio, Finland

<b>A Novel Wavelet Based Technique for Detection and De-Noising of Ocular Artifact in Normal and Epileptic Electroencephalogram .....</b>	180
---	-----

*Venkataramanan, S*, Indian Institute of Technology (IIT) Guwahati, India  
*Kalpakam, NV*, Indian Institute of Technology (IIT) Guwahati, India  
*Sahambi, JS*, Indian Institute of Technology (IIT) Guwahati, India

<b>Multiscale Detection of Transiently Evoked Otoacoustic Emissions .....</b>	184
---	-----

*Marozas, Vaidotas*, Kaunas University of Technology, Lithuania  
*Sörnmo, Leif*, Lund University, Sweden  
*Janušauskas, Arturas*, Kaunas University of Technology, Lithuania  
*Lukoševicius, Arunas*, Kaunas University of Technology, Lithuania

<b>Deriving a Wavelet Based Scale from the Localized Response of the Human Cochlea .....</b>	188
<i>Karam, Jalal, R</i> , Arab Open University, Beirut, Lebanon	

<b>Protein is Compressible .....</b>	192
<i>Hategan, Andrea</i> , Tampere University of Technology, Finland	
<i>Tabus, Ioan</i> , Tampere University of Technology, Finland	

## Audio Signal Processing I: Speech Enhancement and Musical Instruments

<b>Pitch Synchronous Addition and Extension for Linear Predictive Analysis of Noisy Speech .....</b>	196
--	-----

*Shimamura, Tetsuya*, Saitama University, Japan

<b>Inter-Frequency Dependency In MMSE Speech Enhancement .....</b>	200
--	-----

*Li, Chunjian*, Aalborg University, Denmark  
*Andersen, Søren, V*, Aalborg University, Denmark

<b>A Hybrid Speech Enhancement System Employing Blind Source Separation and Adaptive Noise Cancellation .....</b>	204
---	-----

*Low, Siow Yong*, Western Australian Telecommunications Research Institute (WATRI), Australia  
*Nordholm, Sven*, Western Australian Telecommunications Research Institute (WATRI), Australia

<b>Decomposition and Modification of Musical Instrument Sounds Using a Fractional Delay Allpass Filter .....</b>	208
--	-----

*Välimäki, Vesa*, Helsinki University of Technology, Finland  
*Ilmoniemi, Minna*, Helsinki University of Technology, and University of Helsinki, Finland  
*Huotilainen, Minna*, University of Helsinki, Finland

<b>Modal Synthesis of Wind Chime Sounds with Stochastic Event Triggering .....</b>	<b>212</b>
<i>Lukkari, Teemu</i> , Helsinki University of Technology, Finland	
<i>Välimäki, Vesa</i> , Helsinki University of Technology, Finland	

## Communications II: Control and Interference I

<b>Domain Selective Interference Excision and Energy Detection of Direct Sequence Signals .....</b>	<b>216</b>
<i>Lehtomäki, Janne, J</i> , University of Oulu, Finland	
<i>Vartiainen, Johanna</i> , University of Oulu, Finland	
<i>Saarnisaari, Harri</i> , University of Oulu, Finland	
<b>Selection Process of a Transform Selective Interference Suppression Algorithm .....</b>	<b>220</b>
<i>Vartiainen, Johanna</i> , University of Oulu, Finland	
<i>Aromaa, Sami</i> , University of Oulu, Finland	
<i>Saarnisaari, Harri</i> , University of Oulu, Finland	
<i>Juntti, Markku</i> , University of Oulu, Finland	
<b>Reducing Impulsive Noise in DSL Systems - Robustness and Delay .....</b>	<b>224</b>
<i>Gregorio, FH</i> , Helsinki University of Technology, Finland	
<i>Cousseau, JE</i> , Universidad Nacional del Sur, Argentina	
<i>Figueroa, JL</i> , Universidad Nacional del Sur, Argentina	

<b>Interference Suppression in MIMO HSDPA Communication .....</b>	<b>228</b>
<i>Ylioinas, Jari</i> , University of Oulu, Finland	
<i>Hooli, Kari</i> , University of Oulu, Finland	
<i>Kiiskilä, Kai</i> , University of Oulu, Finland	
<i>Juntti, Markku</i> , University of Oulu, Finland	

## Fast DSP Algorithms

<b>A New Fast Level Set Method .....</b>	<b>232</b>
<i>Ganoun, Ali</i> , University of Orleans, and University of Garyounis, France	
<i>Canals, Raphael</i> , University of Orleans, France	
<b>A New, Fast and Low-Cost FFT Estimation Scheme of Signals Using 1-Bit Non-Subtractive Dithered Quantization .....</b>	<b>236</b>
<i>Chedad, L</i> , King Fahd University of Petroleum and Minerals, Saudi Arabia	
<i>Akhtar, S</i> , King Fahd University of Petroleum and Minerals, Saudi Arabia	

## DSP Education

<b>Integrating the Courses of Digital Electronics and Signal Processing by Median Filters .....</b>	<b>240</b>
<i>Koljonen, Janne</i> , University of Vaasa, Finland	
<i>Alander, Jarmo, T</i> , University of Vaasa, Finland	
<b>Distance Learning in Communications Signal Processing Using MATLAB Web Server .....</b>	<b>244</b>
<i>Yan, Peng</i> , Tampere University of Technology, Finland	
<i>Valkama, Mikko</i> , Tampere University of Technology, Finland	
<i>Renfors, Markku</i> , Tampere University of Technology, Finland	

## Communications II: Control and Interference II

<b>PAPR Reduction of OFDM Signal Using Turbo Coding and Selective Mapping .....</b>	<b>248</b>
<i>Abouda, Abdulla, A</i> , Helsinki University of Technology, Finland	

<b>Application of the Generalized Predictive Control Method in Closed-Loop Power Control of CDMA Cellular Communication Systems .....</b>	<b>252</b>
<i>Rintamäki, Matti</i> , Helsinki University of Technology, Finland	
<i>Koivo, Heikki</i> , Helsinki University of Technology, Finland	
<i>Hartimo, Iiro</i> , Helsinki University of Technology, Finland	
<b>Distributed Minimum Outage Removal Algorithm for Multi-Rate CDMA Wireless Communication Systems .....</b>	<b>256</b>
<i>Elmusrati, Mohammed</i> , Helsinki University of Technology, Finland	
<i>Tarhuni, Nasser</i> , Helsinki University of Technology, Finland	
<i>Jäntti, Riku</i> , Helsinki University of Technology, Finland	
<i>Koivo, Heikki</i> , Helsinki University of Technology, Finland	

## Statistical Signal Processing I

<b>Simultaneous Maximum Likelihood Estimation of Time Delay and Time Scaling .....</b>	<b>260</b>
<i>Carlson, Johan, E</i> , Luleå University of Technology, Sweden	
<i>Sjöberg, Frank</i> , Luleå University of Technology, Sweden	
<b>Quantization and Dynamic Range Effects on the Energy Detection .....</b>	<b>264</b>
<i>Koivu, Sami</i> , University of Oulu, Finland	
<i>Saarnisaari, Harri</i> , University of Oulu, Finland	
<i>Juntti, Markku</i> , University of Oulu, Finland	
<b>An Adaptive Bayesian Wavelet Thresholding Approach to Multifractal Signal Denoising .....</b>	<b>268</b>
<i>Seghouane, Abd-Krim</i> , Institut National de Recherche en Informatique et en Automatique, France	
<b>An Easily Implementable Sampling Procedure for Certain Fractal and Other Non-Band Limited Signals .....</b>	<b>272</b>
<i>Lafon, S</i> , INRIA, France	
<i>Véhél, J, Lévy</i> , INRIA, France	

## Communications III: Performance Analysis

<b>Performance Analysis of CCK Modulation under Multipath Fading Channel .....</b>	<b>276</b>
<i>Liu, Shao-bo</i> , Zhejiang University, China	
<i>Huang, Aiping</i> , Zhejiang University, China	
<i>Zhang, Zhao-yang</i> , Zhejiang University, China	
<i>Zhang, Zhijian</i> , Beijing University of Post and Telecommunications, China	
<b>On the Characteristics of MIMO Mutual Information at High SNR .....</b>	<b>280</b>
<i>Salo, J</i> , Helsinki University of Technology, Finland	
<i>Suvikunnas, P</i> , Helsinki University of Technology, Finland	
<i>El-Sallabi, H, M</i> , Helsinki University of Technology, Finland	
<i>Vainikainen, P</i> , Helsinki University of Technology, Finland	
<b>Performance Analysis of Parallel Interference Cancellation Detector in Downlink MC-CDMA Systems .....</b>	<b>284</b>
<i>Duan, Zhanyun</i> , Tampere University of Technology, Finland	
<i>Hidalgo Stitz, Tobias</i> , Tampere University of Technology, Finland	
<i>Valkama, Mikko</i> , Tampere University of Technology, Finland	
<i>Renfors, Markku</i> , Tampere University of Technology, Finland	
<b>An Upper Bound on the Ergodic Mutual Information of Ricean Fading MIMO Channels .....</b>	<b>288</b>
<i>Salo, Jari</i> , Helsinki University of Technology, Finland	
<i>Mikas, Filip</i> , Czech Technical University of Prague, Czech Republic	
<i>Vainikainen, Pertti</i> , Helsinki University of Technology, Finland	

## **Statistical Signal Processing II**

<b>Information Theoretic Clustering: A Unifying Review of Three Recent Algorithms .....</b>	<b>292</b>
<i>Jenssen, Robert</i> , University of Tromsø, Norway	
<i>Eltoft, Torbjørn</i> , University of Tromsø, Norway	
<i>Principe, Jose, C</i> , University of Florida, USA	
<b>A New Approach to Robust Clustering by Density Estimation in an Autocorrelation Derived Feature Space .....</b>	<b>296</b>
<i>Glotos, Dimitris</i> , Tampere University of Technology, Finland, and University of Patras, Greece	
<i>Tohka, Jussi</i> , Tampere University of Technology, Finland	
<i>Soukka, Jori</i> , Arctic Diagnostics Oy, Finland	
<i>Ruotsalainen, Ulla</i> , Tampere University of Technology, Finland	
<b>Independent Component Analysis of Word Contexts and Comparison with Traditional Categories .....</b>	<b>300</b>
<i>Väyrynen, Jaakko</i> , Helsinki University of Technology, Finland	
<i>Honkela, Timo</i> , Helsinki University of Technology, Finland	
<i>Hyvärinen, Aapo</i> , University of Helsinki, Finland	
<b>Skewness Maximization for Impulsive Sources in Blind Deconvolution .....</b>	<b>304</b>
<i>Pääjärvi, Patrik</i> , Luleå University of Technology, Sweden	
<i>LeBlanc, James, P</i> , Luleå University of Technology, Sweden	

## **Image Processing II: Authentication and Pattern Recognition**

<b>Texture Retrieval Using Ordinal Co-Occurrence Features .....</b>	<b>308</b>
<i>Partio, Mari</i> , Tampere University of Technology, Finland	
<i>Cramariuc, Bogdan</i> , Tampere University of Technology, Finland	
<i>Gabbouj, Moncef</i> , Tampere University of Technology, Finland	
<b>Pattern Recognition by Grouping Areas in DCT Compressed Images .....</b>	<b>312</b>
<i>Zhong, Daidi</i> , Tampere University of Technology, Finland	
<i>Defée, Irek</i> , Tampere University of Technology, Finland	

## **Audio Signal Processing II: Speech Recognition**

<b>Annotation and Automatic Recognition of Spontaneously Dictated Medical Records for Norwegian .....</b>	<b>316</b>
<i>Markhus, Vidar</i> , Norwegian University of Science and Technology, Norway	
<i>Gajic, Bojana</i> , Norwegian University of Science and Technology, Norway	
<i>Svarverud, Jacques</i> , Norwegian University of Science and Technology, Norway	
<i>Solbraa, Lars Erik</i> , Norwegian University of Science and Technology, Norway	
<i>Johnsen, Magne, H</i> , Norwegian University of Science and Technology, Norway	
<b>Decoder Issues in Unlimited Finnish Speech Recognition .....</b>	<b>320</b>
<i>Hirsimäki, Teemu</i> , Helsinki University of Technology, Finland	
<i>Kurimo, Mikko</i> , Helsinki University of Technology, Finland	
<b>Using Phone Durations in Finnish Large Vocabulary Continuous Speech Recognition .....</b>	<b>324</b>
<i>Pylkkönen, Janne</i> , Helsinki University of Technology, Finland	
<i>Kurimo, Mikko</i> , Helsinki University of Technology, Finland	

## **Communications IV: Amplifiers and Coding**

<b>Measurements and Modelling of Nonlinear Power Amplifiers .....</b>	<b>328</b>
<i>Jantunen, Peter</i> , Helsinki University of Technology, Finland	
<i>Gámez, Gilda</i> , Helsinki University of Technology, Finland	
<i>Laakso, Timo</i> , Helsinki University of Technology, Finland	
<b>Design of Predistorters for Power Amplifiers in Future Mobile Communications Systems .....</b>	<b>332</b>
<i>Cheong, MY</i> , Helsinki University of Technology, Finland	
<i>Werner, S</i> , Helsinki University of Technology, Finland	
<i>Laakso, TI</i> , Helsinki University of Technology, Finland	
<b>Exact SER-Precoding of Orthogonal Space-Time Block Coded Correlated MIMO Channels: An Iterative Approach .....</b>	<b>336</b>
<i>Hjørungnes, Are</i> , University of Oslo, Norway	
<i>Gesbert, David</i> , Eurécom Institute, France	

## **Audio Signal Processing III: Speech Detection and Classification**

<b>Speech Presence Detection in the Time-Frequency Domain Using Minimum Statistics .....</b>	<b>340</b>
<i>Sørensen, Karsten, V</i> , Aalborg University, Denmark	
<i>Andersen, Søren, V</i> , Aalborg University, Denmark	
<b>Detection of Voice Onset Time (VOT) for Unvoiced Stops (/p/, /t/, /k/) Using the Teager Energy Operator (TEO) for Automatic Detection of Accented English .....</b>	<b>344</b>
<i>Das, Sharmistha</i> , University of Colorado, USA	
<i>Hansen, John, HL</i> , University of Colorado, USA	
<b>Clustering Techniques for Acoustic-Phonetic Speech Classification .....</b>	<b>348</b>
<i>Pohjalainen, Jouni</i> , Helsinki University of Technology, Finland	
<b>Author Index .....</b>	<b>352</b>
<b>Announcement of NORSIG–2006 .....</b>	<b>353</b>