

2009 14th National Biomedical Engineering Meeting

(BIYOMUT 2009)

**Izmir, Turkey
20 – 22 May 2009**



**IEEE Catalog Number: CFP0909G-PRT
ISBN: 978-1-4244-3605-7**

TABLE OF CONTENTS

Effects of Complex Wavelet Transform with Different Levels in Classification of ECG Arrhythmias Using Complex-Valued ANN	1
<i>M. Ceylan, Y. Özbay</i>	
Classification of ECG Arrhythmias Using Type-2 Fuzzy Clustering Neural Network	5
<i>R. Ceylan, Y. Özbay, B. Karlik</i>	
Analyze of Sympathovagal Balance on Ventricular Tachyarrhythmia Patients Using Wavelet Packet Transform	9
<i>Ö. H. Colak, S. Bilgin, Ö. Polat</i>	
Detection of Frequency Sub-Bands on Heart RATE Variability in Supra-Ventricular Tachyarrhythmia Patients Using Artificial Neural Networks	13
<i>S. Bilgin, G. Bilgin, Ö. H. Çolak, E. Köklükaya</i>	
FPGA Based Arrhythmia Classifier	17
<i>A. T. Özdemir, K. Danisman, M. H. Asyali</i>	
Estimation of State Transition Matrix in the Kalman Filter Based Inverse ECG Solution with the Help of Training Sets	21
<i>Ü. Aydın, Y. Serinagaoglu</i>	
The Effects of Geometric Errors on Inverse ECG Solutions Using Kalman Filter and Bayesian MAP Estimation	25
<i>Ü. Aydın, Y. Serinagaoglu</i>	
Examining the Relevance with Sleep Stages of Time Domain Features of EEG, EOG, and Chin EMG Signals	29
<i>S. Günes, K. Polat, M. Dursun, S. Yosunkaya</i>	
Auditory Threshold Detection by Classifying Estimated Short Latency Evoked Potentials.....	33
<i>N. Acir, Y. Erkan, Y. A. Bahtyar</i>	
Classification in Frequency Domain of EEG Signals of Motor Imagery for Brain Computer Interfaces	37
<i>U. Halici</i>	
Application of Wiener Deconvolution Model in P300 Spelling Paradigm	41
<i>B. Erdogan, N. G. Gençer</i>	
Estimation of Partial Directed Coherence and Direction of Information Flow with Auditory Evoked Potentials	45
<i>M. E. Çek, F. A. Savaci, M. Özgören</i>	
Classification of 4-class Motor Imagery EEG Data with Common Sparse Spectral Spatial Pattern Method	49
<i>B. Akinci, N. G. Gençer</i>	
Artificial Single Trial Auditory Evoked Potential Signal Generator	53
<i>Y. A. Bahtiyar, Y. Erkan, N. Acir</i>	
Precision Calibrator Design and Implementation for X-Ray Diagnostic Devices.....	56
<i>H. Gemici, I. Karagöz, M. Özden</i>	
Microcontroller Based Bioimpedance Analyzer.....	60
<i>H. Solmaz, Y. Ülgen, M. Tümer</i>	

Design and Implementation of Radio Frequency Glow Discharge System	64
<i>E. Ocak, H. A. Yücer, I. C. Koçum, D. Çökeliler</i>	
The Construction of Biosensors with Amperometric Tranducers in Biomedical Engineering	68
<i>F. V. Süer, D. Çökeliler, I. C. Koçum</i>	
A Device for Fuctional and Cosmetic Treatment of the Lagophthalmos Due to Facial Palsy	72
<i>M. D. Asik, B. Güçlü</i>	
Design and Fabrication of a Chaotic Mixer for BioMEMS Applications	75
<i>G. Yilmaz, E. Bayraktar, H. Külah</i>	
MR and X-Ray Angiography Registration Intensity Based Approach	79
<i>F. A. Durmaz, A. Ç. Yilmam, C. Öztürk</i>	
Improvement of Segmentation in Sub-cortical Area in MR Images of the Brain	83
<i>M. U. Çiftçioglu, E. Akkoyun, D. Gökçay</i>	
Brain MR Image Segmentation with Fuzzy C-Means and Using Additional Shape Elements	87
<i>O. Özyurt, A. Dinçer, C. Öztürk</i>	
Resolution and Stability Analysis of 16 Channel Magnetic Induction Tomography	91
<i>D. Gürsoy, H. Scharfetter</i>	
Artificial Neural Network Based Positioning Algorithm for PEM Imaging	94
<i>D. Talat, A. Güvenis</i>	
planCT: Chemotherapy Scheduling System	98
<i>S. Sevinc</i>	
A Boolean Information Retrieval System for Mammography Reports	102
<i>T. Berber, A. Alpkoçak</i>	
Information And Communication Technologies in the Management of Diabetes	108
<i>S. Sevinc, B. Tanir</i>	
Analysis of Respiration, Oxygen Saturation and Acoustic Signals of Snoring Patients	112
<i>D. D. Demirgünes, O. Eroglu, T. Akçam, Z. Telatar</i>	
Analysis of Magnetic Resonance Signal in Inhomogenous Main Magnetic Field	116
<i>V. E. Arpinar, B. M. Eyyüboğlu</i>	
A New Wavelet Transform Method for Processing Doppler Signals	120
<i>G. Serbes, N. Aydın</i>	
Performing Discrete Fourier Transform of the Heart Sounds on the Pocket Computer	124
<i>G. E. Güraksin, U. Ergün, Ö. Deperlioglu</i>	
A Comparative Biomechanical Analysis of Pretzel: a Novel Arthroscopic Suture Knot	128
<i>A. N. Türkoglu, U. Akgün, F. Ates, C. A. Yücesoy, M. Karahan</i>	
Body Response Analysis Using Acceleration Platform	132
<i>A. Yardimci, K.-I. Iijima, M. Sekine, T. Tamura</i>	
The Influence of the Bladder Geometry to the Bladder Pressure and Urine Flow	135
<i>Y. Z. Atesci, Ö. Karal, M. Çinar, U. Sentürk, M. Erkek</i>	
Shockwave Simulation in Electrohydraulic Lithotripsy and Wave Performance Optimization	139
<i>E. Çiftçi, B. Yilmaz</i>	
Evaluation of Anxiety Related Changes in Skin Conductance and Blood Volume Pulse Signals During Coronary Anigraphy	143
<i>S. Okkesim, M. H. Asyalı, S. Kara, M. G. Kaya, I. Ardiç</i>	

Performance Evaluation of Radial Basis Function Neural Network on ECG Beat Classification	147
<i>B. Dogan, M. Koriürek</i>	
Diagnosis of Congestive Heart Failure Patients Using Poincare Measures Derived from ECG Signals	151
<i>Y. Isler, M. Kuntalp</i>	
Usage of Statistical Estimation Method for Simultaneous Mapping of Inner and Outer Surfaces of the Heart	155
<i>U. Cunedioğlu, E. Baysoy, B. Yilmaz</i>	
Topographic Analysis of Morphologic Features of ECG Beats	159
<i>Y. Kutlu, M. Kuntalp, D. Kuntalp</i>	
Analysis of the Mobile Phone Effect on the Heart Rate Variability by the Calculation of Correlation Dimension	163
<i>D. Yilmaz, M. Yıldız</i>	
J-Substitution and Equipotential-Projection Based Hybrid MREIT Reconstruction Algorithm	167
<i>R. Boyacıoğlu, B. M. Eyüboğlu</i>	
Anisotropic Conductivity Imaging with MREIT Using J-Substitution Algorithm	171
<i>E. Degirmenci, M. Eyüboğlu</i>	
Electrical Conductivity Imaging Via Contactless Measurements: Data Acquisition Systems Developed in METU Brain Research Laboratories	175
<i>K. Ö. Özkan, N. G. Gençer</i>	
Electrically Stimulated Breat Model's Thermal Imaging Simulations	179
<i>F. Carlak, N. G. Gençer</i>	
Forward Problem Solution for Contactless Electrical Conductivity Imaging with Realistic Head Model	183
<i>R. Zengin, N. G. Gençer</i>	
Diagnosis of Prostat Cancer Using Artificial Neural Networks	187
<i>M. Sinecen, M. Çınar, Ö. Karal, M. Engin</i>	
In Epimascularly Connected Muscle Previous Activity at High Length Yields Sizable History Effects Causing Decrease Muscle Force at Low Lengths	190
<i>F. Ates, P. A. Huijing, C. A. Yücesoy</i>	
Kinematic Analysis of Polycentric Artificial Knee Joint	194
<i>Ö. Baser, L. Çetin, E. Uyar</i>	
Postural Control Strategies Enlightened by the Usage of Tendon Vibration Technique	198
<i>S. Gürses</i>	
Developing An In-Vitro Mechanical Stretching System for Molecular Cell Biology Studies (in English)	202
<i>T. Demirci, H. Oflaz, M. Sarkanat, M. Sakizli</i>	
A Monte Carlo Simulation for Photon Migration in Non-Homogenous Medium	207
<i>R. U. Tok, T. Ölmez, A. Akin</i>	
Adjusting Decision Threshold in Naive Bayes Based IVF Embryo Selection	211
<i>A. Uyar, A. Bener, H. N. Çiray, M. Bahçeci</i>	
Classification of Microorganism Species using Discriminant Analysis	215
<i>B. H. Aksebzeci, S. Kara, M. H. Asyali, Y. Kahraman, Ö. Er, E. Kaya, H. Özbilge</i>	

Alternative Hierarchical Clustering Approach in Construction of Phylogenetic Trees	219
<i>Ç. Kandemir-Çavas, E. Nasibov</i>	
Design and Application of a Sol-gel Based Fluorescent Glucose Arrays	223
<i>N. Yildirim, D. Odaci, G. Öztürk, S. Alp, Y. Ergun, K.-H. Feller, K. Dombusch, S. Timur</i>	
Dynamic Analysis of B Lactamase Legend Interaction	227
<i>P. Kanlikiliçer, N. Büdeyri, B. S. Akbulut, A. Hortaçsu, E. Özkirimli Ölmez</i>	
Computational Prediction of Protein-Protein Interactions in Sphinglipid Signaling Network	231
<i>Y. Güngörmez, E. Özkirimli Ölmez, K. Özergin Ülgen</i>	
cDNA Microarray Image Analysis	235
<i>E. Tozduman, S. Albayrak</i>	
Doppler Ultrasound Signal Denoising Based on Grey Relational Analysis Technique	239
<i>E. Uzunhisarcikli, F. Latifoglu, T. Koza, M. G. Kaya</i>	
Evaluation of Fatty Liver Ultrasonography Images	243
<i>S. Içer, T. İkizeli, A. Coskun, M. H. Asyali</i>	
Extraction of the Liver Vessels from the Abdomen CTA Images by Hessian-Based Vessel Filter	247
<i>H. Dogan, O. Dicle, C. Güzelis</i>	
Analysis of Catheter-based Imaging Devices for Side-looking IVUS	251
<i>A. Sisman, M. Karaman</i>	
Improvement of Mechanical Performances by Plasma Polymerisation Technique for Composite Biomaterials	255
<i>T. Durmaz, S. Erkut, E. Çökeliler</i>	
A Novel Tissue Prefabrication Model in Rabbit Using Polycrylamide Cryogel Scaffolds	259
<i>N. Öztürk, Y. Demirtas, Ö. Karayigit, S. Egri, G. Kibar, T. Güvenc, E. Piskin, A. Karacalar</i>	
A Novel Electrooculogram-Based Human Computer Interface and Its Application as a Virtual Keyboard	261
<i>A. B. Usakli, S. Gürkan</i>	
Interface Design for Automation of the Scanning EMG Method	265
<i>B. Dogan, I. Göker, M. B. Baslo, H. erdal, Y. Ülgen</i>	
Design of an Experimental System for Scanning EMG Method to Investigate Alterations of Motor Units in Neurological Disorders	269
<i>J. Goker, B. Dogan, M. B. Baslo, M. Ertas, Y. Ülgen</i>	
Coarray Sampling Methods For Forward Lookign IVUS Imaging	273
<i>C. Tekes, M. Karaman</i>	
Reconstruction of Wnt/Calcium Signaling Pathway in C. elegans	277
<i>F. Alazi, T. Haliloglu, K. Ö. Ülgen</i>	
Image Processing Method for Artificial Sight Systems Based on Contrast Information	281
<i>M. Özden, N. Karadoruk, I. Karagöz</i>	
Investigation of Different Modalities of Laser Delivery for Skin Welding	285
<i>Ö. Tabakoglu, N. Topaloglu, M. Gülsoy</i>	
Recognition of Down Syndromes Using Image Analysis	289
<i>O. Erogul, M. E. Sipahi, Y. Tunca, S. Vurucu</i>	
Extendable Intramedullary Nail With Mechanical Loading	293
<i>B. Uzun, Ö. Baran, H. Havitçioğlu</i>	

To Compare The Different Scaffolds According to Porosity's Properties	296
<i>B. Çeçen, L. D. Kozacı, M. Yüksel, A. Pasinli, Ö. Oral, H. Havitcioglu</i>	
Effect of Temperature on Electrochemically Deposited HAP Films on CoCrMo Substrate	300
<i>P. K. Çagar, N. F. A. Azem, U. Malayoglu, A. Çakir</i>	
Production of HAP Coating on 316L Stainless Steel Substrates by Sol-gel Technique	304
<i>F. A. Azem, A. Çakir</i>	
Design of Medical Robotic Operating Rooms by SolidWorks	308
<i>H. Karagülle, L. Malgaca</i>	
Novel Structural Design of a Haptic Device for Medical Applications	312
<i>Ö. Selvi, T. Bilginçan, Y. Kant, M. I. C. Dede</i>	
Interactive Education System for Medicine and Engineering Using Three Dimensional Virtual Environments	316
<i>U. Erdogan, A. Özkurt, M. Özkurt, M. Özgören, C. Güzelis, Y. H. Abacioglu, O. Dicle</i>	
Hemodynamic Correlates of Mental Arithmetic Task In Migraine	320
<i>E. Ünlü, H. Bolay, A. Akin</i>	
Investigation of the Effect of Playing Video Games on Visual Attention and Brain Hemodynamics with Functional Near Infrared Spectroscopy	324
<i>S. B. Erdogan, C. Bilgin, B. Turan, A. Akin</i>	
Serbest Dalgiçlarda iKYAS Ile Serebrov Asküler Reaktivite Ölçümü	328
<i>D. Nevsehirli, A. Akin</i>	
Morphological Changes in Natural Zeolites in Simulated Digestion Fluid	332
<i>D. D. Kavak, S. Özçelik, S. Ülkü</i>	
Anaerobic Treatment of Antibiotics, Toxicity Removal and Biogas Production	336
<i>H. Çelebi, D. Sponza</i>	
Control Strategies for the Left Ventricular Assist Devices	340
<i>S. Bozkurt, K. K. Safak, E. Sorgüven, S. Küçükaksu, N. Çıblak, A. F. Okyar, M. A. Akgün, H. Ahn, A. N. Egrican, I. Lazoglu</i>	
Portable Heart Rate Monitoring System	344
<i>M. Engin, E. Z. Engin, S. Bildik, T. Karipçin</i>	
Design of Portable Holter Recorder with MMC Memory for Prephase sleep Apnea Diagnosis	348
<i>Ö. Karadeniz, A. Yılmaz, T. Diindar</i>	
Femoral Artery's Blood Volume Pulse Signal Modelling	352
<i>S. Yılmaz, O. Toker, N. Arslan</i>	
Acrylic Star Block Copolymers as Hydrophobic Drug Carriers	356
<i>G. Genç, A. Batigün, O. Bayraktar, Ö. Altıntaş, Ü. Tunca, G. Hizal</i>	
Stability of trans-Resveratrol Incorporated in Chitosan Microspheres	360
<i>D. Altıok, E. Altıok, O. Bayraktar, F. Tihminlioglu</i>	
Monoclonal Antibody Production by the Immobilized Hybridoma Cells via Alginate Encapsulation	364
<i>S. M. Selimoglu, D. Ayyıldız, A. Nalbantsoy, M. Elibol, S. I. D. Gürhan</i>	
Automated Clustering of Histology Slide Texture Using Co-Occurance Based Grayscale Image Features and Manifold Learning	365
<i>D. Önder, B. Karaçah</i>	

Yumasak Doku Modellemede Quasi-Lineer Viskoelastik Malzeme Parametrelerinin Dogrusal Olmayan Optimizasyon Yöntemi ile Tesbiti	369
<i>F. Dogan, M. S. Çelebi</i>	
Extraction of Vessels of Fundus Images with Three Different Methods	373
<i>E. Doganay, O. Toker, S. Kara, A. Güven, A. Ö. Öner</i>	
Subjective Evaluation Methods and Physiological Measurements Used to Determine Clothing Thermal Comfort	377
<i>S. Kaplan, A. Okur</i>	
Immobilization of Thrombin to Bio/Chemically Modified Synthetic Fabrics	382
<i>A. Akkaya, N. Pazarlioglu</i>	
Tissure Welding by Thulium Laser System: Predosimetry Studies	385
<i>T. Bilici, Ö. Tabakoglu, H. Kalaycioglu, N. Topaloglu, A. Kurt</i>	
Microcontroller Based Hodgkin-Huxley Model Neuron Simulation	389
<i>. Isler, M. Kuntalp, G. Gönel</i>	
Comparison of 980-nm and 1070-nm In Endovenous Laser Treatment	393
<i>N. Topaloglu, Ö. Tabakoglu, M. Ü. Ergenoglu, M. Gülsoy</i>	
Radyoterapide, IMRT Fontomu ile Isinlama Alaninin Dogrulanmasi ve Hesaplanan Dozun Ölçümle Karsilastririlmesi	397
<i>A. Inal, I. Akkurt, H. Vidinlioglu, H. Mandrali</i>	
Fiber Tracking Using Recursive Stack Data Structure	399
<i>D. G. Duru, M. Özkan</i>	
Automated Location of Optic Disk and Fovea in Color Fundus Images	402
<i>A. Güven, A. Ö. Öner, S. Kara</i>	
Optical and Thermal Response of Laser Irradiated Tissue	406
<i>B. Kurt, M. Gülsoy</i>	
Human Resources, Vocational Education and Vocational Standards in Turkish Health Industry: A Self-Evaluation of the Sector	409
<i>I. Eren</i>	
Investigation of Muscle Fatigue by Processing EMG Signal	413
<i>Ö. Çakir, M. Engin, E. Z. Engin, U. Yumrukaya</i>	
Extraction of Fetal ECG from Maternal ECG	416
<i>Ç. Serdengeçti, M. Engin, E. Z. Engin, S. Balci</i>	
Detection of BIS Stage Levels via Fuzzy Clustering Approach	419
<i>G. Ulutagay, E. Nasibov</i>	
The Impact of Daubechies Wavelet Performances on Ventricular Tachyarrhythmia Patients for Determination of Dominant Frequency Bands in HRV	423
<i>S. Bilgin, Ö. Polat, Ö. H. Colak</i>	
Development of a Minimal Inflation Pressure Pneumatic Tourniquet for Extremity Surgeries	427
<i>B. Tuncali, N. Gökmen, M. Sakar, O. Adatepe</i>	
Analyzing Strain Rate in Echocardiography Images by Using MATLAB	431
<i>A. Eken, K. Serbetçi, O. Tüfekçioglu, B. Yilmaz</i>	
Contactless Electrical Conductivity Imaging Simulations Using FDFD Method	435
<i>C. B. Top, N. G. Cencer</i>	
Synthesis of Nanosized Calcium Deficient Hydroxyapatite by Microwave	439
<i>M. Ipekoglu, S. Altintas</i>	

Bubble Detection on Left Atrium Related With Patent Foramen Ovale	443
<i>I. B. Parlak, S. M. Egi, A. Ademoglu, P. Germonpre, Ö. B. Esen, S. Aydın, S. Tekin, C. Balestra, A. Marroni</i>	
The Effects of Classical and Turkish Music Samples on the Autonomic Nervous System.....	447
<i>M. Yildiz, D. Yilmaz</i>	
The Biomechanical Properties of Meniscus.....	451
<i>H. Havitcioglu, B. Çeçen, L. Baktiroglu, M. Erduran, A. Karakasli</i>	
Design and Implementation of Electrospinning System.....	453
<i>M. Dogan, O. Karatay, D. Çükeliler, I. C. Koçum</i>	
Multi-channel Acoustic Mapping of Respiratory System Based on Adventitious Sound Source Separation.....	457
<i>I. Sen, M. Saraçlar, Y. P. Kahya</i>	
The Effects of Temperature Changes to the Anesthetic Gas Concentration	461
<i>M. Sezdi, F. Dogruyol, A. Akan, F. Tank</i>	
Multivariate Classification of fMRI Images.....	464
<i>E. Karahan, C. Öztürk</i>	
Comparison of Atlas Based Segmentation and Manual Segmentation of Hippocampus	467
<i>H. Kutucu, Ç. Eker, Ö. Kitis, A. S. Gönül</i>	
Projection of the Steady State Visual Evoked Potentials on Prefrontal Cortex	470
<i>M. Özker, Z. Bayraktaroglu, I. Kasikçi, B. Erdogan, A. Akin, T. Demiralp</i>	
Electronically Adjustable Wide Bandwidth Instrumentation Amplifier	473
<i>S. A. Tekin, H. Ercan, M. Alçi</i>	
Texture Analysis of Liver Hydatid Cyst	477
<i>Ö. Kayaalti, M. H. Asyali, I. S. Tuna, A. C. Durak</i>	
Prototype Hardware Design for Brain Computer Interface Applications.....	481
<i>B. Erdogan, B. Akinci, E. Acar, A. B. Usakli, N. G. Gençer</i>	
Modelling of Electromagnetic Interaction and Local Temperature Increase in Human Tissues.....	484
<i>Ö. Isik, E. Korkmaz</i>	
Detection of the Epileptiform Signals by Independent Component Analysis Methods	488
<i>G. Yildez, M. Tümer, A. Ademoglu</i>	
Frequency Following Brain Oscillations Evoked by Vibrotactile Stimulation of the Distal Phalanx in Normal Subjects.....	493
<i>D. Torun, M. Yildiz, B. Güçlü</i>	
The Bioinformatics Tools for the Estimation of Disordered Regions in Proteins	498
<i>O. Imer, L. Çavas</i>	
Feasibility of Head Imaging Using Multi-frequency Magnetic Induction Tomography	502
<i>D. Gürsoy, H. Scharfetter</i>	
Classification of EMG Signals Using Wavelet Based Autoregressive Models and Neural Networks to Control Prothesis-Bionic Hand	505
<i>I. Yazici, E. Köklükaya, B. Baslo</i>	
Automatic Registration of Follow-up Brain MRI Scans	509
<i>A. Demir, G. Ünal, K. Karaman</i>	
Delta Oscillatory Responses to Somatosensory Stimuli in Blind Humans.....	513
<i>A. Öviz, B. Aydın, Ç. Güdücü, M. Özgören</i>	

Preparation and Characterization of Chitosan Containing Acrylic Bone Cement Formulations	516
<i>T. Endogan, A. Kiziltay, N. Hasirci</i>	
Electrophysiological and Bispectral Indeks Applications in REM Sleep	518
<i>S. Kocaaslan, A. Öniz, M. Özgören</i>	
Effects of Depression on Hippocampal Memory: A Computational Model	521
<i>G. Yıldız</i>	
The Role of Fibrin as a Ligan for ICAM-1 and PMN in Melanoma Adhesion Under Different Shear Conditions	525
<i>T. Özdemir, C. Dong</i>	
EEG and sLORETA: The Dichotic Listening Test Preliminary Results	528
<i>M. Özgören, O. Bayazıt, U. Erdogan, A. Öniz</i>	
Numerical Simulation of Flow Through Stenotic Artery	531
<i>H. I. Tarman</i>	
Comparison of Soprano and Baritone Dichotic Listening Test Scores Between Genders: Preliminary Results	534
<i>O. Bayazıt, A. Öniz, S. Taslica, M. Özgören</i>	
3D Blood Flow Simulations in Human Arterial Tree Bifurcations	538
<i>E. Aribas, S. Piskin, M. S. Çelebi</i>	
Author Index	