

2013 IEEE 3rd Portuguese Meeting in Bioengineering

(ENBENG 2013)

**Braga, Portugal
20-23 February 2013**



**IEEE Catalog Number: CFP1315P-PRT
ISBN: 978-1-4799-1705-1**

TABLE OF CONTENTS

IMAGE ANALYSIS IN RADIOLOGY AND NUCLEAR MEDICINE - AUTOMATED ANALYSIS OF MORFOLOGY AND FUNTION OF THE HUMAN BRAIN	1
<i>R. Faustino, J. Rio, C. Ferreira, J. P. Marques, C. Nunes , G. Cunha, C. Moura, C. Januario</i>	
VOXEL-BASED MORPHOMETRY ANALYSES IN ALZHEIMER'S DISEASE	5
<i>A. Margarida Matos, Paula Faria, Miguel Patrício</i>	
EVALUATION OF DENTAL IMPLANTS USING COMPUTED TOMOGRAPHY	9
<i>S. B. Goncalves, J. H. Correia, A. C. Costa</i>	
USING OF THE ULTRASOUND FREQUENCY DEPENDENT ATTENUATION AND NAKAGAMI DISTRIBUTION FOR CATARACT EVALUATION	13
<i>Danilo Jesus, Elena Velte, Miguel Caixinha, Mario Santos, Jaime Santos</i>	
FUNCTIONALIZED GOLD NANOPARTICLES FOR DRUG DELIVERY	17
<i>Sílvia Castro Coelho, Sandra Rocha, M. Carmo, Sílvia Castro Coelho, Petras Juzenas</i>	
ADSORPTION OF INTACT DPPG LIPOSOME ON ROUGH POLYELECTROLYTE MULTILAYERS	21
<i>Andreia A. Duarte, Sergio L. Filipe, Maria Raposo</i>	
CHITOSAN-ALGINATE MICROPARTICULATE DELIVERY SYSTEM FOR AN ALTERNATIVE ROUTE OF ADMINISTRATION OF BCG VACCINE	25
<i>Liliana Aranha Caetano, Rita Amaral, Lara Figueiredo, Antonio J. Almeida, Lídia M. D. Goncalves</i>	
IMMUNOLIPOSOMES FOR ALZHEIMER'S DISEASE THERAPY - NANOCARRIERS TO CROSS THE BLOOD-BRAIN BARRIER AND BIND TO AMYLOID BETA-PEPTIDE	28
<i>Joana A. Loureiro, Barbara Gomes, Manuel A. Coelho, Maria Do Carmo Pereira, Sandra Rocha</i>	
SYNTHESIS OF WELL CONTROLLED DENDRITIC STRUCTURES FOR BIOMEDICAL APPLICATIONS	31
<i>Aderito Amaral, Joana Gois, Armenio C. Serra, Jorge F. J. Coelho</i>	
REAL-TIME PLASMID MONITORING OF BATCH AND FED-BATCH ESCHERICHIA COLI CULTURES BY NIR SPECTROSCOPY.....	35
<i>Marta B. Lopes, Kevin C. Sales, Vitor V. Lopes, Cecília R. C. Calado</i>	
DESIGN, FABRICATION AND MODELING OF A CUFF ELECTRODE FOR PERIPHERAL NERVE STIMULATION.....	39
<i>Fabio Rodrigues, Paulo Mendes, Luis Goncalves, Marian Bartek, Alexandre Fouchard</i>	
CORNEAL METABOLIC IMAGING BY FAD AUTOFLUORESCENCE LIFETIME.....	43
<i>A. Batista, S. F. Silva, J. P. Domingues, A. M. Morgado</i>	
AN OVERVIEW OF MODELING AND SIMULATION FOR LAB-ON-A-CHIP APPLICATIONS.....	47
<i>S. O. Catarino, G. Minas, J. M. Miranda, S. Lanceros-Mendez</i>	
A STENT-GRAFT ENDOLEAKAGE MONITOR: TELEMETRY SYSTEM BASED ON INDUCTIVE-COUPLING TRANSMISSION FOR IMPLANTABLE PRESSURE SENSORS	51
<i>Cristina Oliveira, Nuno Almeida, Jose Machado Da Silva</i>	
EEG-SIGNALS BASED CONTROL STRATEGY FOR PROSTHETIC DRIVE SYSTEMS.....	55
<i>Sara Sequeira, Carine Diogo, Fernando J. T. E. Ferreira</i>	
ALL-SOLID-STATE BATTERIES: AN OVERVIEW FOR BIO APPLICATIONS.....	59
<i>R. Sousa, J. A. Sousa, J. H. Correia, J. F. Ribeiro, L. M. Goncalves</i>	
LOW LEVEL LASER THERAPY ON INJURED RAT MUSCLE.....	63
<i>M. Mantineo, A. M. Morgado, J. P. Pinheiro</i>	
EXPERIMENTAL DEMONSTRATION OF INDUCTION BY MEANS OF A TRANSCRANIAL MAGNETIC STIMULATOR COIL IMMERSSED IN A CONDUCTING LIQUID	67
<i>Hugo Simoes, Marilia Dias Silva, Carina Vieira Ferreira, Luis Jesus, Helder Oliveira</i>	
ELECTROCHEMICAL IMMUNOSENSOR FOR AMYLOID BETA-PEPTIDE DETECTION: PRELIMINARY STUDY	71
<i>Pedro Carneiro, Cristina-Delerue Matos, Maria Do Carmo Pereira</i>	
DEVELOPMENT OF AN OPTICAL COHERENCE TOMOGRAPH (OCT) FOR SMALL ANIMAL RETINAL IMAGING	75
<i>Susana F. Silva, José P. Domingues, Jose Agnelo, Miguel Morgado, Rui Bernardes</i>	
MICRO ANTENNAS FOR IMPLANTABLE MEDICAL DEVICES	79
<i>P. Anacleto, P. M. Mendes, E. Gultepe, D. H. Gracias</i>	
RH PHENOTYPES ANALYSIS BY SPECTROPHOTOMETRY IN HUMAN BLOOD TYPING	83
<i>J. M. Fernandes, F. O. Soares, G. Minas</i>	

SPECTROSCOPY AND PH BIOSENSORS FOR THE DETECTION OF GASTROINTESTINAL DYSPLASIA	87
<i>S. Pimenta, T. S. Monteiro, L. M. Goncalves, G. Minas</i>	
CONSTITUTIVE MODELLING OF THE ANNULUS FIBROSUS: NUMERICAL IMPLEMENTATION AND NUMERICAL ANALYSIS.....	91
<i>Clara Cavalcanti, Helder Correia, Andre Castro, J. L. Alves</i>	
IMPLANT SHAPE INFLUENCE ON THE MECHANICAL BEHAVIOR OF BREAST IMPLANTS - APPLICATION TO PIP IMPLANTS	95
<i>Rita Rynkevic, Pedro Martins, Marco Parente, Renato Natal</i>	
MULTIVARIATE ANALYSIS OF WALKER-ASSISTED AMBULATION.....	99
<i>M. Martins, C. P. Santos, L. Costa, A. Frizera-Neto</i>	
THE ASSESSMENT OF THE THERMAL NECROSIS DUE A DRILLING DENTAL PROCESS WITH OR WITHOUT IRRIGATION	103
<i>E. M. M. Fonseca, K. Magalhaes, M. G. Fernandes, G. Sousa, M. P. Barbosa</i>	
DEVELOPING A TIMED NAVIGATION ARCHITECTURE FOR HOSPITAL DELIVERY ROBOTS	106
<i>Jorge B. Silva, Cristina Santos, Joao Sequeira</i>	
WIRELESS SENSOR NETWORKS FOR BIOMEDICAL APPLICATIONS - QUALITY OF SERVICE, ADMISSION CONTROL AND LIFETIME-EXTENDING CHALLENGES.....	110
<i>Carlos Abreu, Paulo Mendes</i>	
DEVELOPMENT OF A SYSTEM FOR MONITORING AND TRACKING OF PHYSIOTHERAPEUTIC MOVEMENTS IN PATIENTS WITH NEUROLOGICAL DISEASES	114
<i>Tiago Martins, Vitor Carvalho, Filomena Soares</i>	
ROBOTICA-AUTISMO PROJECT: TECHNOLOGY FOR AUTISTIC CHILDREN	118
<i>F. Soares, S. Costa, S. Silva, N. Gonçalves, J. Rodrigues, Cristina Santos, Ana Paula Pereira, M. Fatima Moreira</i>	
EYE TRACKING SYSTEM USING PARTICLE FILTERS	122
<i>Ricardo Campos, Cristina Santos, Joao Sequeira</i>	
IMPROVED BIOMEDICAL DEVICE FOR SPASTICITY QUANTIFICATION.....	126
<i>Joao Ferreira, Vitor Moreira, Jose Machado, Filomena Soares</i>	
RAPID PROTOTYPING TECHNIQUE APPLIED TO SURGICAL GUIDANCE OF SECOND RECONSTRUCTION SURGERY OF DEFECTIVE MANDIBLE.....	130
<i>Chen Yadong, Pang Liyong, Li Hu, Yu Tianbiao, Wang Wanshan</i>	
FROM OPTICAL COHERENCE TOMOGRAPHY TO MAXWELL'S EQUATIONS.....	135
<i>Ana Sílvia, F. C. Silva, Antonio L. Correia</i>	
COMPUTATIONAL MODEL OF THE LGMD NEURON FOR AUTOMATIC COLLISION DETECTION.....	139
<i>Ana Silva, Cristina Santos</i>	
CLINICAL DIAGNOSIS OF PATELLOFEMORAL DISORDERS - THE ROLE OF BIOENGINEERING	143
<i>Ana Leal, Filipe Silva, Paulo Flores, Helder Pereira, Joao Espregueira-Mendes</i>	
MATHEMATICAL MODEL FOR PARTIAL VENTRICULECTOMY	147
<i>Jose Sergio Domingues, Marcos Pinotti Barbosa</i>	
REMOTE PHYSIOLOGICAL SYSTEMS (REPHYS) LABORATORY: A DIDACTIC LEARNING ENVIRONMENT	151
<i>C. Barros, C. P. Leao, F. Soares, G. Minas, J. Machado</i>	
A NOVEL APPROACH TO UNDERSTAND BIOENGINEERING AND HEALTH SCIENCE - THE ROLE OF WEBOMETRIC ANALYSIS FOR THE CREATION OF NEW KNOWLEDGE	155
<i>L. Marques, M. A. Zulueta, R. Faustino</i>	
SCALING LIMITS OF RECTANGULAR AND TRAPEZOIDAL CHANNEL FINFETS	159
<i>J. Mohseni, J. D. Meindl</i>	
STUDY OF THE EFFEC TS OF ELECTROSPUN POLY(EPSILONCAPROLACTONE)/GELATIN MATRICES ON HUMAN MESENCHYMAL STEM CELL CULTURE	162
<i>Beatriz J. C. Monteiro, Joao D. T. Guerreiro, Francisco Dos Santos, Joaquim S. M. Cabral, Claudia Lobato Da Silva, Frederico Castelo Ferreira</i>	
PIEZOELECTRIC TRANSDUCER SYSTEM FOR IMPROVING MIXING IN 96 WELL MICROPLATES	168
<i>L. R. Silva, G. Minas, S. Lanceros-Mendez</i>	
OPTIMISATION OF SYNTHESIS, PURIFICATION AND REFORMULATION OF (R)-[N-METHYL-¹¹C]PK11195 FOR IN VIVO PET IMAGING STUDIES.....	174
<i>Vitor H. Alves, Antero J. Abrunhosa, Miguel Castelo-Branco</i>	

BIOMECHANICAL MODELING AND SIMULATION OF THE SPIDER CRAB (MAJA BRACHYDACTyla)	179
<i>Rita Rynkevic, Manuel F. Silva, M. Arcelina Marques</i>	
PRE-CLINICAL VALIDATION STUDY OF OPTICAL PROBES FOR HEMODYNAMIC PARAMETERS ASSESSMENT	185
<i>Ines Santos</i>	
BIOMECHANICAL STUDY OF A FETUS DURING A VAGINAL DELIVERY	191
<i>Maria Elisabete Teixeira Da Silva, Marco Paulo Lages Parente</i>	
BIOMECHANICAL PROPERTIES OF BREAST TISSUE - THE ELASTIC PROPERTIES OF THE BREAST SKIN	197
<i>Nilza Ramiao, Pedro Martins, Antonio Augusto Fernandes</i>	
QUANTITATIVE COMPUTED TOMOGRAPHY VERSUS DENSITOMETRY IN DIAGNOSTIC OF OSTEOPOROSIS	203
<i>M. J. Maciel, J. H. Correia</i>	
MONITORING OF BEDRIDDEN PATIENTS: DEVELOPMENT OF A FALL DETECTION TOOL.....	209
<i>Maria C. Vilas-Boas, Miguel V. Correia, Pedro Silva, Sergio R. Cunha</i>	
DOSE OPTIMIZATION IN CT, IN NUCLEAR MEDICINE AND IN PET-CT PROCEDURES.....	215
<i>Ana T. C. Nunes, Pedro Vaz, Paula Madeira</i>	
DIABETIC PERIPHERAL NEUROPATHY ASSESSMENT THROUGH CORNEAL NERVE MORPHOMETRY	221
<i>Iulian Otel, Pedro Cardoso, Leonor Gomes, Sofia Gouveia, Susana F. Silva, Jose Paulo Domingues, António Miguel Morgado, Maria Joao Quadrado</i>	
PHOTOPILETHYSMOGRAPHIC LOGGER WITH CONTACT FORCE AND HYDROSTATIC PRESSURE MONITORING	227
<i>Pedro Santos, Vania Almeida, Joao Cardoso, Carlos Correia</i>	
A SOCIALLY ASSISTIVE ROBOT FOR PEOPLE WITH MOTOR IMPAIRMENTS	233
<i>Manuel Pinheiro, Estela Bicho</i>	
ROBOTIC IMPLANTATION OF INTRACEREBRAL ELECTRODES FOR DEEP BRAIN STIMULATION	240
<i>C. Faria, E. Bicho, M. Rito, L. Louro, S. Monteiro, W. Erlhagen</i>	
A SELF-TUNABLE DYNAMIC VIBRATION ABSORBER: PARKINSON'S DISEASE'S TREMOR SUPPRESSION	246
<i>C. J. Teixeira, M. F. Gago, E. Bicho, L. A. Rocha</i>	
AUTOMATIC SYSTEM FOR DETERMINATION OF BLOOD TYPES USING IMAGE PROCESSING TECHNIQUES	252
<i>Ana Ferraz</i>	
INFLUENCE OF THE ROBOTIC EXOSKELETON LOKOMAT ON THE CONTROL OF HUMAN GAIT: AN ELECTROMYOGRAPHIC AND KINEMATIC ANALYSIS	258
<i>Filipe Barroso, C. Santos, J. C. Moreno</i>	
3D RECONSTRUCTION OF A SPINAL MOTION SEGMENT FROM 2D MEDICAL IMAGES: OBJECTIVE QUANTIFICATION OF THE GEOMETRIC ACCURACY OF THE FE MESH GENERATION PROCEDURE	264
<i>S. Cortez, J. C. P. Claro, J. L. Alves</i>	
DEVELOPMENT OF A RF CONTACTLESS RESPIRATORY RATE MONITOR.....	270
<i>Joao C. Andre, Paulo M. Mendes</i>	
POINT-OF-CARE TESTING DEVICE FOR ANALYSIS OF DIABETES MELLITUS.....	276
<i>J. A. Oliveira, G. Minas, M. Correia-Neves, Jose Mariz</i>	
Author Index	