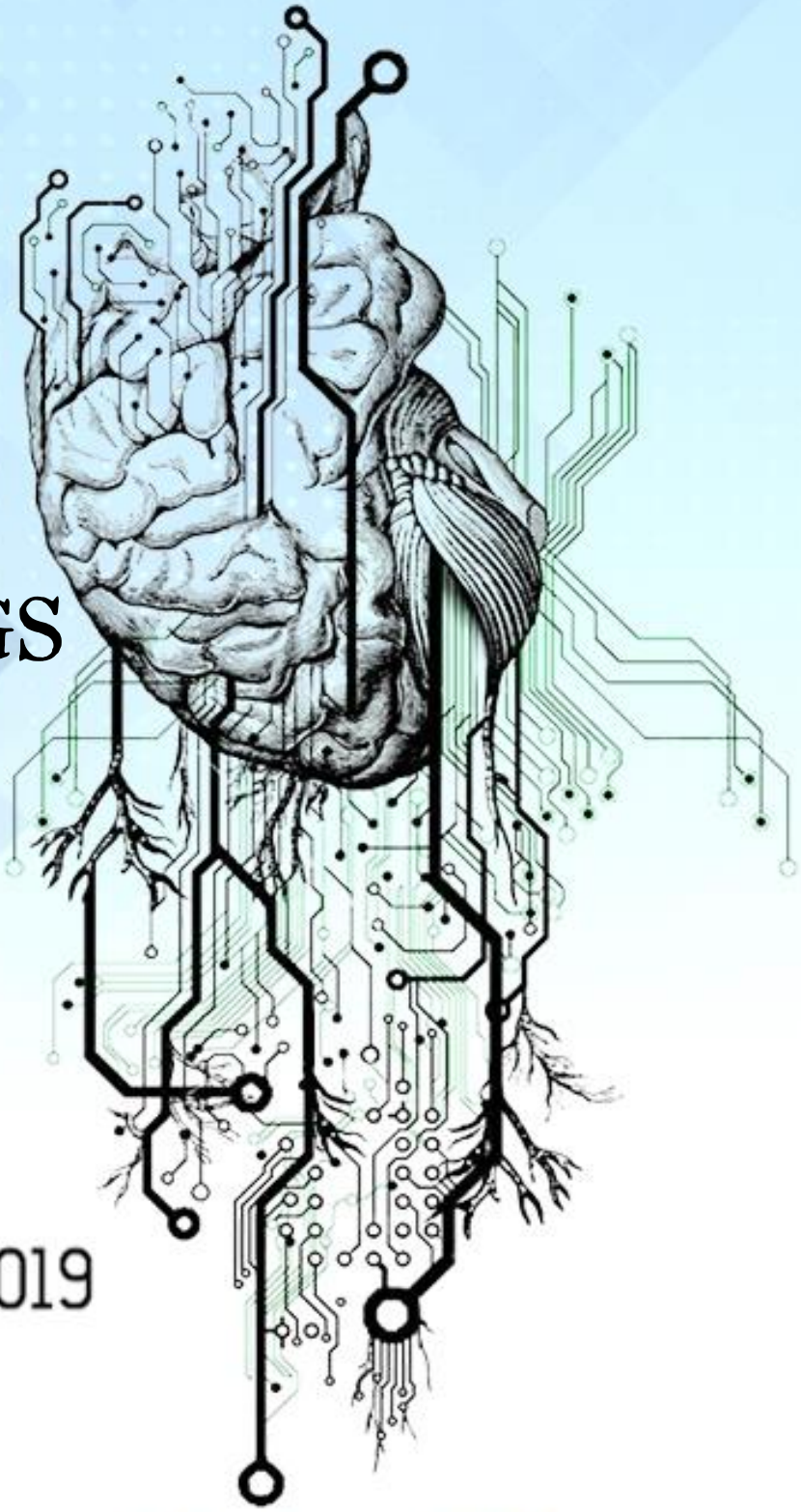
6th ENBENG

IEEE PORTUGUESE MEETING IN BIOENGINEERING



PROCEEDINGS BOOK

22-23 February 2019

ISEL, Lisbon

embs.ieee-pt.org/6th-enbeng-2019

ISEL INSTITUTO SUPERIOR DE ENGENHARIA DE LISBOA

IEEE EMB Portugal Chapter

IEEE PORTUGAL SECTION

Preface:

This book presents the abstracts and articles accepted for presentation at the IEEE 6th Portuguese Meeting on Bioengineering (ENBENG-2019) organized by the IEEE Engineering in Medicine & Biology Society (EMBS) Chapter of the IEEE Portugal Section, to be held in the ISEL-Instituto Superior de Engenharia de Lisboa, Lisbon, between 22th and 23th, February of 2019.

The Portuguese Meetings on Bioengineering aims to represent a meeting point between students and researchers for discussion of the diverse innovative areas of bioengineering, including:

- Biomedical Imaging and Image Processing;
- Biophysics;
- Micro and Nano Bioengineering.
- Instrumentation and Biomedical Signal Processing;
- Wearable Biomedical Sensors and Systems;
- Biomechanics;
- Modeling Physiological Systems;
- Neuroengineering and Neurosciences;
- Rehabilitation Engineering;
- Medical Robotics and Human-Machine Interfaces;
- Biomolecular, Biocelular and Bioprocess Engineering;
- Bioinformatics and Systems Biology;
- Biomaterials and Tissue Engineering;
- Stem Cell Biology and Regenerative Medicine;
- Health Informatics and Telemedicine;
- Medical Equipment Management;
- Bioengineering Education and Society.

The high diversity of areas emphasizes the multidisciplinary nature of ENBENG-2019, highlighting its relevance in integrating and complementing knowledge from academic, business and clinical areas. The 2019 conference program included 6 keynote lectures, oral and poster sessions. With this conference we aim to promote Bioengineering and Biomedical Engineering research, raise the national awareness to this field, and reinforce national cooperation between researchers, research groups and institutions working in these areas of interest.

Authors were invited to submit their work in one of three possible formats:

- 1-Page extended abstracts;
- 4-Page full regular papers;
- 4-Page full papers summarizing a MSc Thesis defended in the last 3 years.

All submitted papers were peer reviewed by two independent researchers before acceptance. The accepted works were presented at the meeting either as oral or poster communications, depending on the decision of the scientific committee. High quality 4-page full papers can be further included in IEEE Xplore.

ENBENG-2019 had 238 works submitted, from which, were accepted 79 abstracts and 149 full papers. From the accepted works, 34 were accepted for oral presentations distributed along 6 sessions, and the remaining were presented at 4 poster sessions, as described in the conference program.

The submissions involved authors from several Portuguese Institutions, and foreign countries including Spain, Italy, Belgium, Germany, Ukraine, Pakistan, Japan, Taiwan, Singapore, Brazil, Peru and Canada.

Finally, we would like to thank to all the Sponsors, members of the Scientific Committee, Invited Lecturers and Authors for sharing their work with the ENBENG-2019 community.

Lisbon, February 22th, 20179

The Organizing Committee of the IEEE 6th Portuguese Meeting on Bioengineering (ENBENG-2019)

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Media Partners:

• *Technologies* (ISSN 2227-7080) is an international open access journal singularly focusing on emerging scientific and technological trends and is published quarterly online by MDPI with an average publishing time of 50 days from submission to publication in 2017. It was covered by Emerging Sources Citation Index – Web of Science and Inspec (IET), more detailed could be found at: http://www.mdpi.com/journal/technologies/

• *Bioengineering* (ISSN 2306-5354; CODEN: BIOEBG) is an international scientific peer-reviewed open access journal on the science and technology of bioengineering published quarterly online by MDPI. More information can be found here: https://www.mdpi.com/journal/bioengineering/

• *Conference Partner* was founded in 2011. It is an academic website for conferences and journals information. The vision of Conference Partner is to help researchers to organize and share academic information in a more efficient way. As of Nov. 2018, about 2,990 conferences, 680 journals and 17,500 researchers were included on Conference Partner. https://www.myhuiban.com/home

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- I3Bs, Guimarães
- Biomaterials & Tissue Eng.

- Renato Natal
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- Biomechanics

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6th ENBENG

IEEE PORTUGUESE MEETING IN BIOENGINEERING

Friday, 22-Feb.

08:30	Registration	
09:10	**Opening Ceremony**	
	Biomedical Imaging, Image Processing, Health Informatics and Telemedicine	Chairman: Miguel Coimbra
09:30	Keynote Talk – Bioengineering approaches to movement neurological diseases	João Paulo Cunha
10:00	Data-driven source separation of the second heart sound	Francesco Renna
10:15	Evaluation of the attenuation correction on myocardial perfusion imaging: a phantom study	Francisco Oliveira
10:30	**Poster Session I** - Coffee Break	Chairman: Manuel Matos
	Biomedical Imaging, Image Processing, Health Informatics and Telemedicine	Chairman: Rui Bernardes
11:15	Identification of brain connectivity disruptions due to thalamic lesions in early development using Diffusion-Weighted MRI	Ana Rita Oliveira
11:30	Classification of patients with parkinsonian syndromes using medical imaging and artificial intelligence algorithms	Helena Pereira
11:45	Textural information from the retinal nerve fiber layer in multiple sclerosis	Ana Nunes
12:00	Analysis of the performance of specialists and an automatic algorithm in retinal image quality assessment	Diego Wanderley
12:15	An accounting mechanism for standard medical imaging services	Rui Lebre
12:30	Care4Value: A clinical instrument data collection platform for long-term healthcare units	Marisa Maximiano and Catarina Isabel Reis
12:45	Lunch Break	
	Biomaterials, Cellular and Tissue Engineering & Regenerative Medicine	Chairman: Claúdia Lobato-Silva
14:15	Keynote Talk – Skin tissue engineering: present and future	Alexandra Marques
14:45	Functionalization of orthodontic alloys with DLC coatings	António Fróis
15:00	Composite scaffolds for bone regeneration and infection control	Victor Martin
15:15	Taking a step forward: optimization of an anti-adhesive biopolymer coating using industrial techniques	Jorge Cardoso
15:30	RNAi as a tool to inhibit the angiogenic potential of human Mesenchymal Stem/Stromal Cells in malignancy	Cristiana Ulpiano
15:45	Application of hyperthermia for cancer treatment: synthesis and characterization of magnetic nanoparticles and their internalization on tumor cell lines	Catarina Chaparro
16:00	**Poster Session II** - Coffee Break	Chairman: Carlos Ferreira
	Biomechanics	Chairman: Amélia Loja
16:45	Keynote Talk – The colors of biomechanics	Renato Natal
17:15	Computational modelling of human lower limb for reproduction of walking dynamics with muscles: healthy and pathological cases	Mariana Silva
17:30	Ankle Foot Orthosis (AFO) stiffness design for mitigation of ankle inversion injury	Daniela Teixeira
17:45	Numerical simulation of aneurysms with finite element and meshless methods	Joana Silva
18:00	Effect of the ultrasonic melt treatment on the deployment outcomes of a magnesium stent manufactured by microcasting: a finite element analysis.	Inês Gomes
18:15	Analysing the peripheral nerve tissue using distinct discretization techniques	Tomé Albuquerque
18:30	**Presentation of the Portuguese Chapter IEEE-EMBS and of the ISEL EMBS Student Branch**	

6th ENBENG

IEEE PORTUGUESE MEETING IN BIOENGINEERING

Saturday, 23-Feb.

08:45	Registration	
	Micro- and Nano-Bioengineering	Chairman: Graça Minas
09:15	Keynote Talk –Lab-on-chip platforms for chemical and biological analysis	João Pedro Conde
09:45	Electrospun composite cellulose acetate/iron oxide nanoparticles non-woven membranes for magnetic hyperthermia applications	Ricardo Matos
10:00	Haemocompatibility test of simple Magnetic Nanoparticles using the distribution of deformed RBCs	Teresa Lage
10:15	Towards a portable magnetoresistive biochip for urease-based biocementation monitoring	Débora Albuquerque
10:30	**Poster Session III** - Coffee Break	Chairman: Lina Vieira
	Biomolecular Eng. & Bioprocess Eng. & Bioinformatics & Modelling Physiological systems	Chairman: Hugo Ferreira
11:15	Cross disease network analysis	Inês F. Ramos
11:30	Evaluation of scoring functions for large scale application of virtual screening in the identification of novel beta-lactamase inhibitors	Tatiana Vieira
11:45	Assessing the molecular fingerprint of T lymphocyte activation	Luís Ramalhete
12:00	Brain tumor modelling and resection limits using millimetre wavelengths	Vera Cardoso
	Medical Equipment Management	Chairman: José Augusto Sobral
12:15	Maintenance of electromedicine equipment: a case study based on outsourcing	Fernanda Coutinho
12:30	Reprocessing of Single-Use Medical Devices in hospital environment: evolution and future perspectives	Fátima Sofia Costa
12:45	Lunch Break	
	Instrumentation and Biomedical Signal Processing	Chairman: Miguel Morgado
14:15	Keynote Talk – Bitalino: what's next?	Hugo Silva
14:45	Low band spectral tilt analysis for pathological voice discrimination	Carlos Meneses
15:00	Design, modelling and control of an active weight-bearing knee exoskeleton with a series elastic actuator	Bruno Freitas
15:15	PhisioStream: on the use of general-purpose log management and streams processing software stacks for first-responders monitoring	José Carvalho
15:30	Cognitive and autonomic neural manifestations captured using wearable sensors for reliable software development	Gonçalo Duarte
15:45	Arterial stiffness in portuguese patients with axial spondyloarthritis: a pilot study	Beatriz Ramalho
16:00	**Poster Session IV** - Coffee Break	Chairman: Carlos Ferreira
	Neuroengineering & Biophysics	Chairman: Isabel Rocha
16:45	Keynote Talk – Chatting with neurons: novel approaches to analyze function and communication in neuronal cultures using a combination of microfluidics and microelectrode arrays	Paulo Aguiar
17:15	Functional electrical stimulation systems	Pedro Fernandes
17:30	Wide residual network for Lung-Rads^TM screening referral	Carlos Ferreira
17:45	**Awards of the best MSc Thesis in Bioengineering**	
18:00	**Closing Ceremony**	

6th ENBENG

IEEE PORTUGUESE MEETING IN BIOENGINEERING

Friday, 22-Feb. (10:30)

10:30 11:15	**Poster Session I**	Biomedical Imaging and Image Processing, Health Informatics and Telemedicine, Neuroengineering and Neurosciences
A01	Skin neoplasms dynamic thermal assessment	Carolina Magalhaes, Joaquim Mendes, Rita Valenca-Filipe and Ricardo Vardasca
A02	Supporting the stratification of non-small cell lung carcinoma for anti PD-L1 immunotherapy with digital image registration	Francisco Cunha, Catarina Eloy and Nuno Matela
A03	Informatics, A Powerful Tool For The Relationship Between Health And Climate	Maria Meirelles, Helena Vasconcelos, Aliz Vitos and Afonso Pinto
A04	Using Texture Analysis To Explore The Cutaneous Biomechanical Profile	Henrique Silva, Francisco Rego, Rafaela Francisco and Luis Monteiro Rodrigues
A05	Texture Analysis Can Be Used To Improve Skin Sonography Quantification Capacities	Ana Macedo, Henrique Silva and Luis Monteiro Rodrigues
A06	Exploring Texture Analysis As A Tool To Characterize The Tissue Viability Imaging (Tivi®) Perfusion Image	Henrique Silva, Sérgio Nuno and Luis Monteiro Rodrigues
A07	Welding technologies in the health sector	Diogo Gomes, Ivan Galvão and Maria Loja
A08	Imaging Of Rat Prostate: Ultrasonography, Computed Tomography And Magnetic Resonance Imaging	Mário Ginja, Paula A. Oliveira, Maria J. Pires, Miguel Correia-Cardoso, Rita Ferreira, Margarida Fardilha and Ana Faustino
A09	Low Intensity Focused Ultrasound Modulation of Neural Circuits Activity	Francisca Machado, Ricardo Magalhães, Paulo Mendes and Nuno Sousa
A10	Ensemble Learning Approaches for Retinal Vessel Segmentation	Alexandrine Ribeiro, Ana Lopes and Carlos Silva
A11	Dilated Convolutions In Retinal Blood Vessels Segmentation	Ana Lopes, Alexandrine Ribeiro and Carlos Silva
A12	Segmentation Squeeze-and-Excitation Blocks in Stroke Lesion Outcome Prediction	Joana Amorim, Adriano Pinto, Sérgio Pereira and Carlos A. Silva
A13	Development Of An Automation-Compatible Breast Cancer Imaging System Using Microwaves	João M. Felício, José Bioucas-Dias, Jorge R. Costa and Carlos A. Fernandes
A14	Understanding network reorganization after glioma regrowth: comparing connectivity measures from functional magnetic resonance imaging to direct cortical stimulation	Joao Leote, Ricardo Loução, Martin Lauterbach, Joana Monteiro, Rita G. Nunes, Catarina Viegas, Antonio Pérez-Hick, Ana Silvestre and Hugo A. Ferreira
A15	A mobile application to complement face-to-face interactions in psychological intervention for social anxiety management	Bruno Alves, Ilídio Oliveira, Carla Pratas and Anabela Pereira
A16	TeenPower: A new obesity prevention strategy to e-empower and engage teenagers through gamification techniques applied to a self-monitoring mobile application	Marta Carvalho, Rodrigo Alves and Catarina Isabel Reis
A17	TeenPower: Measuring the effectiveness of an intervention program and engaging adolescents towards physical activities using location-aware gamification	Rodrigo Alves, Marta Carvalho and Catarina Reis
A18	Understand and characterize mental effort in a programming-oriented task	Ana Teixeira, Anabela Gomes, Joana Eloy and Antonio Mendes
A19	Quality assessment and feedback of Smart Device Microphone Spirometry executed by children	Rute Almeida, Bernardo Pinho, Cristina Jácome, João Fonseca Teixeira, Rita Amaral, Filipa Lopes, Tiago Jacinto, Rui Guedes, Mariana Pereira, Ivânia Gonçalves and João Almeida Fonseca
A20	Visual Human-Machine Interface using Compressed Reality	Catia Pinho, Berta Neto, Alexander Goltsev, Sandra Vieira and Antonio Teixeira
A21	Epileptic seizure classification using the NeuroMov database	Paulo Maia, Elisabeth Hartl, Christian Vollmar, Soheyl Noachtar and João Paulo Cunha
A22	Quantitative Assessment of Central Serous Chorioretinopathy in Angiographic Sequences of Retinal Images	Carlos Ferreira, Susana Penas, Jorge Silva and Ana Maria Mendonça
A23	Acoustic Analysis of Swallowing Sounds in Healthy Subjects	Inês Carneiro, Adelaide Dias, Dália Nogueira, Nuno Oliveira and Miguel Coimbra
A24	Rheumatic Fever Characterization Based on indicators extracted from Echocardiograms exams	Luiz Pires and Miguel Tavares Coimbra
A25	Mitral Valve Leaflets Segmentation in Echocardiography using Convolutional Neural Networks	Eva Costa, Nelson Martins, Malik Saad Sultan, Diana Veiga, Manuel João Ferreira, Sara Mattos and Miguel Coimbra
A26	Joint Capsule Segmentation in Ultrasound Images of the Metacarpophalangeal Joint using Convolutional Neural Networks	Nelson Martins, Eva Costa, Diana Veiga, Manuel Ferreira and Miguel Coimbra
A27	Designing a Software for Qualitative and Quantitative Analysis of Oropharyngeal Swallowing by Videofluoroscopy	Aida Silva, Ricardo Santos, Roberta Silva and Miguel Coimbra
A28	Quantification of the difference between Cardiac Magnetic Resonance signals in perfusion studies with and without motion correction algorithms	Teresa Moreira, Miguel Coimbra, Nuno Almeida and Nuno Bettencourt
A29	Healthcare Transformed: Diagnostics Anywhere With Low-Cost, Low-Energy, And High-Performance Deep Learning Embedded Systems	Cleber Ramos, Francesco Renna and Miguel Coimbra
A30	Medical image analysis using deep learning - a skin lesion malignancy classification system	José Reisinho, Francesco Renna and Francisco Vicente
A31	LeucoDiff: Mobile Application for Hematology Students Improve their Skills in Calculating the Leukocyte Formula.*	Daniel Alves, Margarida Félix, Rui Jesus and Renato Abreu
A32	Automatic Versus Semi-Automatic method for the striatum specific uptake ratio quantification based on [123I]FP-CIT SPECT images	Maria Elias, Pedro M. Jorge, Sérgio Figueiredo, Luís Oliveira and Edgar L. Pereira
A33	Segmentation of pathological liver tissue with Dilated Fully Convolutional Networks: A Preliminary Study	Jessica Delmoral, Durval Costa, Diogo Borges and João Manuel R. S. Tavares
A34	A Novel Macular Visual Distrortion Asessment Method: A Chorioretinopathy (CSR) Case study	Navid Mohaghegh, Ebrahim Ghafar-Zadeh and Sebastian Magierowski

A35	The Blood Glucose Biosensor: Historical Overview And Future Trends	Nelson Silva, Hugo Silva and Manuel Matos
A36	Evaluation of knee joint cartilage through T2 Mapping technique by Magnetic Resonance	Cândida Sofia Vitorino, Maria Margarida Ribeiro, Elisabete Teresa Carolino, João Paulo Costa and Aida Palmira Ferreira
A37	Breast Cancer Diagnosis using a Neural Network	Vera Ribeiro, Eduardo Solteiro Pires and Paulo Moura Oliveira
A38	Prototyping And Analysis Of Comfort In Driving A Bicycle Equipped With A Magneto-Rheological Damper	Arlindo Pascoal and José Gonçalves
A39	Numerical Criteria for Atherosclerotic Plaque Classification	Margarida Cardoso, José Alberto Rodrigues and Liliana Pereira

6th ENBENG

IEEE PORTUGUESE MEETING IN BIOENGINEERING

Friday, 22-Feb. (16:00)

16:00 16:45	**Poster Session II**	Biomechanics, Biomaterials, Tissue Engineering & Regenerative Medicine
B01	Limiting Performance Analisys of a Head Protection Helmet Using Multicriteria Control Optimization	Paulo Moita, Miguel Antunes, José Aguilar Madeira, João Barradas Cardoso and Aníbal Valido
B02	Male Sphincter-Urinary System: fem simulation under a clinical pathology	António André, Sérgio Pinto and Pedro Martins
B03	Visualization and Interaction with the Male Urinary System using Virtual Reality	Sérgio Pinto, António André and Pedro Martins
B04	Mechanical Behavior Of Agarose Gel As Breast Tissue Mimicking Material	Ana Margarida Teixeira and Pedro Martins
B05	The structural analysis of a femur bone using a 2D FEM approach	Raquel Sousa, Jorge Belinha, Renato Natal, Vânia Oliveira and António Oliveira
B06	Thermal Computational Model To Predict Thermal Necrosis In Bone Sarcomas	Cláudia Rua, Vania Oliveira, Paulo Piloto, Elza M M Fonseca, Jorge Belinha, Renato Natal Jorge and José Vasconcelos
B07	The Structural Analysis of a Molar Tooth Using Finite Element Method	Elena Gabriela Deliu, Jorge Belinha and Renato Natal Jorge
B08	Biomechanical Simulation Of Human Chromosomes	A. Catarina S. Veiga, Jorge Belinha and Renato M. Natal Jorge
B09	Using the finite element method and radial point interpolation method to analyze the jaw bone	M. Beatriz F. Moutinho, Jorge Belinha and Renato M. Natal Jorge
B10	A Computational Meshless Technique to Predict Angiogenesis	Ana Guerra, Jorge Belinha and Renato Natal Jorge
B11	Biomechanical Simulation of a Dental Implant using Finite Element Method Analysis	Daniel Costa, Jorge Belinha and Renato Natal Jorge
B12	Using Meshless Methods To Simulate Blood Clots	Maria Inês Barbosa, Jorge Belinha and Renato Natal Jorge
B13	Numerical analysis of chitosan nerve guidance channels with different geometries	Joana Gomes, Jorge Belinha and Renato Natal Jorge
B14	Additive Manufacturing from a Biomedical Perspective	Bárbara Malafaya, Marco Marques, Isaac Ferreira, Margarida Machado, Gabriela Caldas, Jorge Belinha, Jorge Lino and Renato Natal Jorge
B15	Numerical study of blood flow in stented arteries: comparison of stent designs and viscosity models	Diogo Lopes, Hélder Puga and José Teixeira
B16	The Effect Of Synthetic Meniscal Implant On Intraarticular Contact Mechanics	Duraisamy Shriram, Yee Han Dave Lee and Karupppasamy Subburaj
B17	Low-Velocity Vehicle Collisions Can Result in Serious Consequences to Meniscectomized Individuals: A Biomechanical FE Study	Shanmugam Dhivya and Duraisamy Shriram
B18	Influence of functional foot orthoses on the plantar pressure of 5 handball athletes - analysis using a novel system during 3 athletic tasks	João Esteves, André Luz, Rodrigo Fidalgo, Mário Briôa and José Matos
B19	Study of the Risk of Ankle Injury During Impact on the Ground and Definition of Support orthoses	Hélder Vieira, Teresa Ferraz, Tomás Sousa, Inês Martins, A. Marques, S. Reis
B20	An Optimization Strategy for Customized Radiotherapy Head Immobilization Masks	D.S. Craveiro, M.A.R. Loja, Lina Vieira and M. Vinyas
B21	Characterization of a dance movement using a Kinetic camera	Ines Barbosa, João Milho, Inês Lourenço, Ana Mota, Vanda Nascimento, André Carvalho, Ricardo Portal and Alda Carvalho
B22	Biomechanics of a Pedestrian Accident Reconstruction	Ricardo J.F. Portal, J. Pereira Dias and Luís G. Sousa
B23	Lower limb assessment of dynamic stiffness on different human maximum vertical jump	Carlos Rodrigues, Miguel Correia, João Abrantes, Marco Aurélio Benedetti Rodrigues and Jurandir Nadal
B24	Production of bioactive hydroxyapatite coating by coblast process for orthopedic implants	Milene Santos, Catarina Santos and Maria João Carmezim
B25	New Fully Biodegradable Peg-Dendrimers: Promising Non-Viral Delivery Vectors For Sirna	Ana Spencer, Natália Magalhães, Victoria Leiro and Ana Pêgo
B26	Optical clearing techniques for the imaging of 3D spheroids	Daniel Silva, Elisabete Costa, André Moreira, Duarte de Melo-Diogo and Ilídio Correia
B27	Bioactive 3d Printed Scaffolds Functionalized With Reduced Graphene Oxide For Bone Tissue Regeneration	Cátia S. D. Cabral, Sónia P. Miguel, Duarte de Melo-Diogo, Ricardo O. Louro and Ilídio J. Correia
B28	Targeted cancer photothermal therapy using hyaluronic acid functionalized green reduced graphene oxide	Rita Lima-Sousa, Duarte de Melo-Diogo, Cátia G. Alves, Elisabete C. Costa, Ricardo O. Louro and Ilídio J. Correia
B29	Ir780 And Dox Loaded Hyaluronic Acid-Based Micelles For Targeted Cancer Chemo-Phototherapy	Cátia Alves, Duarte de Melo-Diogo, Rita Lima-Sousa, Elisabete C. Costa and Ilídio J. Correia
B30	Functionalization Of Gold Core Silica Shell Nanorods With Tpgs And Pei For Cancer Chemo-Phototherapy	Carolina F. Rodrigues, Catarina A. Reis, André F. Moreira, Paula Ferreira and Ilídio J. Correia
B31	Gaining temperature insight on cellular hyperthermia assays using nanomagnetic-based logic gates	Rute A. Pereira, Rui Oliveira-Silva, Fábio Martins Silva, Vítor M. Gaspar, A. Ibarra, Ángel Millán, Filipa L. Sousa, João F. Mano and Nuno J. O. Silva
B32	Exploring The Functionalization Of Silicone Catheters With Sophorolipids Towards The Prevention Of Infection	Rita Mendes, Judite Costa and Isabel A. C. Ribeiro
B33	Developing a new antimicrobial biomaterial coating for biofilm prevention in medical devices	Catarina Severo, Ana F. Bettencourt and Isabel A.C. Ribeiro
B34	Anti-Sialyl-Tn Multifunctional Magnetic Nanoparticles For Cancer Theranostic	Catarina Chaparro, Liliana Loureiro, Manuel Almeida, Paula Videira, Paula Soares and João Paulo Borges

B35	Valorization of platelets with no therapeutic value with Pulsed Electric Fields	Duarte Rego, Luis Manuel Redondo, Ana Paula Sousa, Sofia Abreu, Margarida Serra and Vitor Espirito Santo
B36	Multi-material scaffolds for temporomandibular joint disc implants	Daniela Trindade, Carla Moura, Luís Francisco, Carlos Campos, Milena Vieira, Pedro Morouço, David Ângelo and Nuno Alves
B37	High Flux Hybrid Cellulose Acetate/Silica Membranes For Hemodialysis	Mónica Faria, Tiago Eusébio and Maria Norberta de Pinho
B38	Bi-soft segment polyurethane membranes for Membrane Blood Oxygenators	Monica Faria, Tiago Eusébio and Maria Norberta de Pinho
B39	Membrane Blood Oxygenators: Oxygen Mass Transfer in a Gas/Membrane/Liquid System	Tiago Eusébio, Mónica Faria and Maria Norberta de Pinho
B40	Metal Ion Release During Orthodontic Treatment – An In Vivo Study	Alexandra Mendes, Sónia Alves and Cristina Santos
B41	Impact of additive technologies in the health sector for 2030	Emanuel Serrano, Liliana Vitorino and Henrique Almeida
B42	General overview of biomanufacturing technologies	Henrique Almeida, Mário Correia
B43	Changes in N-acetyltransferase 8 in kidney tubular cell: injury, recovery and mesenchymal stromal cell-based therapy	Patrícia Canotilho Santos Grácio, Clara Gonçalves Dias, Filipa Lopes-Coelho , Emília Monteiro, Jacinta Serpa, Cláudia Lobato da Silva, and Sofia Azeredo Pereira
B44	Cytokine Optimization for Ex Vivo Expansion of Hematopoietic Stem/Progenitor Cells in a Mesenchymal Stem/Stromal Cell Co-Culture System	André Branco, Sara Bucar, Carla Lilaia, Joaquim Cabral, Ana Fernandes-Platzgummer and Cláudia Silva
B45	Impact of human mesenchymal stem/stromal cell donors on conditioned medium composition	Maria João Canha Pereira, Luís Ramalhete, Sandra Aleixo, Cláudia Lobato da Silva, Joaquim Ms Cabral, Cecília Calado and Ana Fernandes-Platzgummer
B46	In vitro stimulation of osteoblasts using capacitive interdigitated electrodes to improve implant osseointegration	Bárbara Sousa, Jorge A. F. Ferreira, Marco P. Soares Dos Santos and Sandra I. Vieira
B47	Inverse Dynamic Analysis Of A Human Planar Lower Limb Model Using Fully Cartesian Coordinates	Ivo Roupa, Sérgio Gonçalves and Miguel Tavares da Silva

6th ENBENG

IEEE PORTUGUESE MEETING IN BIOENGINEERING

Saturday, 23-Feb. (10:30)

10:30 11:15	**Poster Session III**	Micro and Nano Bioengeneering, Biomolecular and Bioprocess Engeneering, Bioinformatics, Modelling Physiological Systems and Equipment Management
C01	Patients' requirements prioritization on the House of Quality: The Case of Glucose Monitoring Devices in Young Adults with Type 1 Diabetes	Patricia A. Dias, Isabel M. João and João C. Lourenço
C02	The Design And Manufacture Of A Dynamic Brain Phantom Using Direct Digital Manufacturing Techniques	Silvestre Alberto Piedade, Francisco Caramelo, Nuno Chicharro, Saba Abdulghani, Paula Pascoal-Faria, Geoffrey Mitchell and Nuno Matela
C03	Design, Manufacture And Evaluation Of Dynamic Digital And Physical Phantom Of A Life-Size Mouse	João Saraiva, Francisco Caramelo, Nuno Chichorro, Paula Pascoal-Faria, Saba Abdulghani, Geoffrey Mitchell and Nuno Matela
C04	Design, Evaluation Of Digital Dynamic, Multimodal Phantom Of A Life-Size Mouse Using Computational Simulation	Vítor Amorim, Francisco Caramelo, Nuno Chichorro, Paula Pascoal-Faria, Saba Abdulghani, Geoffrey Mitchell and Nuno Matela
C05	Development of a Risk Management Tool for Healthcare Providers	Beatriz Águas and José Sobral
C06	Development of a Tool for Selection and Acquisition of Medical Devices based on the Analytic Hierarchy Process	Vítor Oliveira, José Sobral and Maria Margarida Ribeiro
C07	Biological Effects of the Electromagnetic Fields in Magnetic Resonance Imaging	Ana Catarina Luis and Maria Margarida Ribeiro
C08	Performance Measurement Of Comon Medical Devices	Filipa Mageijo, Maria Do Céu Ferreira and Manuel Matos
C09	Dimensioning The Park Of Mechanical Ventilators On An Intensive Care Unit Of A Hospital	Rui Assis and Manuel Matos
C10	Standards about Medical Equipment Maintenance – A Survey	Vanda Umbelino, Fernanda Coutinho, Inácio Fonseca and Isabel Monteiro
C11	Rapid Microfluidic Mixer by Using Boundary-Driven Acoustic Streaming	Reza Rasouli and Maryam Tabrizian
C12	Capacitive Detection of Insulin Antibody enhanced by AC Electrothermal mixing	James Porter, Paresa Modares, Rafael Castiello and Maryam Tabrizian
C13	Antioxidant-loaded mucoadhesive nanoparticles for eye drug delivery: a new strategy to evaluate the reducing of the generation of oxidative stress	Sandra Cordeiro, Lídia Gonçalves and Joana Marto
C14	Green Synthesized Gold Nanoparticles For Biomedical Applications	Ana Carvalho, Ana Ribeiro, Alessandro Fantoni and Elisabete Alegria
C15	Microfluidic Devices Fabrication: Surface Wettability Tailoring By Chemical Vapor Deposition	Patricia A. G. Canane, Vania Silverio and Susana Cardoso de Freitas
C16	Microfluidic Gradient Generator For Cell Biology Study	Pedro R. Brandao, Vania Silverio and Susana Cardoso de Freitas
C17	Electrospun Composite Cellulose Acetate/Iron Oxide Nanoparticles Non-Woven Membranes For Magnetic Hyperthermia Applications	Ricardo Matos, Catarina Chaparro, Jorge Silva, Manuel Valente, João Borges and Paula Soares
C18	Polyurethane urea membranes for membrane blood oxygenators: synthesis and gas permeation properties	Tiago Eusébio, Mónica Faria, Eduardo J. M. Filipe, Maria Norberta de Pinho
C19	Bactericide Activity Of Nanofiltration Composite Membranes – Cellulose Acetate/Silver Nanoparticles And Cellulose Acetate/Silver Ion Exchanged Zeolites	Stefan Beisl, Sílvia Monteiro, Ricardo Santos, Ana Sofia Figueiredo, María Guadalupe Sánchez-Loredo, Maria Amélia Lemos, Francisco Lemos, Miguel Minhalma and Maria Norberta de Pinho
C20	Analytical Strategy for Magnetic Flow Cytometry Signals Classification	Ana Soares, Ruben Afonso, Diogo Caetano, Verónica Martins, Moisés Piedade and Susana Cardoso
C21	Novel methodology for quick detection of bacterial metabolites	Maria Gonçalves, Jorge Fernandes, Viktor Fetter, Mário Diniz and Valentina Vassilenko
C22	Fast and Direct Detection of Biogenic Amines in Fish by GC-IMS Technology	Cláudia Espalha, Jorge Fernandes, Mário Diniz and Valentina Vassilenko
C23	Hemodynamics in human uterine arteries: modeling and computational fluid dynamics calculations	Andreia Serrano, Vanessa Cunha, Jorge P. Teixeira, Maria B. Pires, João G. O'Neill and Valentina Vassilenko
C24	Label-Free Impedometric Antibiogram Test	Firouz Abbasian, Dasantila Golemi-Kotra, Sebastian Magierowski and Ebrahim Ghafar-Zadeh
C25	Numerical and Experimental Investigations on Micromixers Geometries for High Ratio Flow Rates	Vitor Magalhães, Vânia Pinto, Paulo Sousa, Susana Catarino, Luis Gonçalves and Graça Minas
C26	Experimental Development of Antioxidant Alginate Films	João Silva, Dorinda Marques-da-Silva, Vânia Ribeiro and Ricardo Lagoa
C27	A Novel Procedure For Expression And Isolation Of Cancer-Associated Antigen Steap1	Jorge Ferreira, Sandra Rocha, Teresa Santos Silva, Cláudio Maia and Luís Passarinha
C28	Biological Activities Of Volatile Oil From Pinus Halepensis Obtained By Hydrodistillation And Supercritical Co2 Extraction	Sara Figueira, Mariem Khouja, Amin Karmali, António Palavra, Chokri Messaoud, Mohamed Larbi Kouja, Abdelhamid Khaldi and Jose Coelho
C29	Bioactive Activity Of Plant Extract From Rauwolfia Caffra Sonder By Using Different Solvents	Pedro Cruz and Amin Karmali
C30	Biological Activity Of Plant Extracts From Tithonia Diversifolia And Analysis By Ftir And Fluorescence Spectroscopy	Karla Ramos and Amin Karmali
C31	Hemorrhagic Events In The Patient Undergoing Cardiac Catheterization	Marta Neves and Iola Pinto
C32	The Use Of Next-Generation Sequencing In The Study Of Monogenic Obesity	Bernardo Serrasqueiro, Luísa Veiga, José Silva Nunes and Miguel Brito
C33	Oxytocin And Mental Health In College Students	Ana Carolina Veríssimo, Margarida Santos, Miguel Brito and Luísa Veiga

C34	Classification of recombinant Sacharomyces cerevisiae cells using PLS-DA modelling based on MIR spectroscopy	Pedro Sampaio and Cecília Calado
C35	Spectral Biomarkers of Genotoxicity from Methanol Extracts of Blood	Hélder Teixeira, Luís Ramalhete, Carina Ladeira and Cecilia Calado
C36	Effect of culturing human embryos in group on the composition of spent culture media	Joana Santos, Luís Ramalhete, Miguel Gallardo Molina and Cecilia Calado
C37	Assessing The Effect Of Oocyte Vitrification On Embryo Metabolism By Ftir	Joana Santos, Luís Ramalhete, Ana Braula, Miguel Gallardo Molina and Cecilia Calado
C38	Impact of the solvent extraction method on the plasma metabolome profile	Filipa Pires, Luís Ramalhete, Edna Ribeiro and Cecilia Calado
C39	Effect of consumption of green tea extracts on the plasma molecular signature	Ruben Araújo, Luís Ramalhete, Edna Ribeiro and Cecilia Calado
C40	Cell Viability, Proliferation And Metabolic Satus In One Unique And Simple Assay	Viviana Caldeira, Ruben Araújo, Luís Ramalhete and Cecilia Calado
C41	Towards an automated statistical workflow for biomarker screening in Fourier-transform infrared spectroscopy	Bernardo Ribeiro da Cunha, Sandra M. Aleixo, Luís Fonseca and Cecília Calado
C42	Optimization of production medium for expression and secretion of a heterologous cutinase by a recombinant E. coli strain	Fátima Serralha, Luis Fonseca and João Prazeres
C43	Molecular dynamic simulations and QM/MM studies addressed to build an active Tryptophan Synthase model. A critical enzyme to treat tuberculosis.	Carla S. Silva Teixeira, Sérgio F. Sousa and Nuno M. F. S. A. Cerqueira
C44	CODIS and the Portuguese DNA Database: novel intersections between biology, medicine, informatics, mathematics, engineering and law	Antonio Amorim, Heloisa Afonso Costa, Paulo Ferreira Gomes and Francisco Corte Real
C45	Quantifying bacterial fitness in intracellular dynamics	Francisco Pauperio and Erida Gjini
C46	Numerical modeling of cardiomyocytes, using Finite Element Method	Joana Oliveira and José Alberto Rodrigues
C47	Detection and adsorption of Triclosan on sensors based on PAH/PVS thin-films	João Pereira da Silva, Paulo Zagalo, Cátia Magro, Iola Pinto, Paulo Ribeiro and Maria Raposo
C48	Dppg Liposomes Adsorbed On Polyeletrolytes Multilayers	Andreia Duarte and Maria Raposo

6th ENBENG

IEEE PORTUGUESE MEETING IN BIOENGINEERING

Saturday, 23-Feb. (16:00)

16:00 16:45	**Poster Session III**	Medical Robotics, Human-Machine Interfaces, Instrumentation, Wearable and Biomedical Signal Processing, Rehabilitation Engineering and Biophysics
D01	Head-movement interface for wheelchair driving based on inertial sensors	Daniel Gomes, Filipe Fernandes, Eduardo Castro and Gabriel Pires
D02	Assistive Robotic Hand Orthosis (ARHO) controlled with EMG: evaluation of a preliminary prototype	Diogo Farinha, João Dias, Pedro Neves, Kátia Pereira, Carlos Ferreira and Gabriel Pires
D03	Recognition of human activity based on sparse data collected from smartphone sensors	João Figueiredo, Gonçalo Gordalina, Pedro Correia, Gabriel Pires, Luís Oliveira, Ricardo Martinho, Rui Rijo, Pedro Assunção, Alexandra Seco and Rui Fonseca-Pinto
D04	Characterizing The Microvascular Response To Hyperoxia With Different Laser Doppler Flowmetry Signal Parameters	Henrique Silva, Hugo Ferreira, Helena Vieira, Henrique Francisco and Luis Monteiro Rodrigues
D05	A Portable Device to Improve Valsalva Maneuver Performance on Earth and Space	Mauricio Machado da Rosa, Michele dos Santos Gomes da Rosa and Isabel Rocha
D06	Telemedicine in Aviation: a Case Study in a Brazilian Airline	Lucas dos Santos Boneli, Guido Carim Júnior and Michele dos Santos Gomes da Rosa
D07	The Entrepreneurial University and the Training for Innovation of the New Generations	Michele dos Santos Gomes da Rosa, Maurício Machado da Rosa and Isabel Rocha
D08	A Hybrid System for Assessing Mental Workload	Pedro Mendonca and Manuel Adler Abreu
D09	Rheology of living cells	Raquel Portela, José Maria Franco, Pedro L. Almeida, Pedro Patrício, Rita G. Sobral and Catarina R. Leal
D10	Analysis of Electrocardiographic Patterns for Epileptic Seizure Prediction	Francisco Sargo, Ana Fred, Carla Bentes and Hugo Silva
D11	Exploring Physiological Multimodality For Emotional Recognition Through Virtual Reality Elicitation	Joana Pinto, Ana Fred and Hugo Silva
D12	Plasmonic properties of gold nanospheres coupled to reduced graphene oxide for biosensing applications	Alessandro Fantoni, Vladan Stojkovic, Miguel Fernandes, Manuela Vieira, Elisabete E.B.C. Alegria and Ana Ribeiro
D13	PVDF piezoelectric flow sensor for velocity measurements aiming malaria diagnostics: a preliminary approach	Martinho Sanches de Baêna, Graça Minas and Susana Catarino
D14	A Preliminary Strategy for Fall Prevention in the ASBGo Smart Walker	Ana Pereira, Nuno Ferrete Ribeiro, Graça Minas and Cristina P. Santos
D15	A Survey of Fall Prevention Systems Implemented on Smart Walkers	Ana Pereira, Nuno Ferrete Ribeiro, Graça Minas and Cristina P. Santos
D16	An Overview of Fall-Related Systems Developed in Canes	Pedro Mouta, Nuno Ferrete Ribeiro, Luís Gonçalves and Cristina P. Santos
D17	Three-Link Inverted Pendulum for Human Balance Analysis: A Preliminary Study	João Lopes, Luis Moreira, Cristina Pinheiro, Daniel Sanz-Merodio, Joana Figueiredo, Cristina.P.Santos and Elena Garcia
D18	Study of Gait Cycle Using a Five-Link Inverted Pendulum Model: First Developments	Luis Moreira, Cristina Pinheiro, João.M.Lopes, Daniel Sanz-Merodio, Joana Figueiredo, Cristina P. Santos and Elena Garcia
D19	Kinematic and kinetic study of sit-to-stand and stand-to-sit movements towards a human-like skeletal model	Cristiana Pinheiro, João.M.Lopes, Luis Moreira, Daniel Sanz-Merodio, Joana Figueiredo, Cristina Santos and Elena Garcia
D20	Feedback-Error Learning for Gait Rehabilitation Using a Powered Knee Orthosis: First Advances	Pedro Nuno Fernandes, Simão Carvalho, Joana Figueiredo, Juan C. Moreno and Cristina P. Santos
D21	The Potential of Visual Cues to Overcome Freezing of Gait in Parkinson's Disease	Rui Moreira, Helena Gonçalves, Ana Rodrigues and Cristina Santos
D22	Instrument-based ergonomic assessment: A perspective on the current state of art and future trends	Sara Cerqueira, Alexandre Silva and Cristina Santos
D23	Human Activity Recognition Systems: State of Art	Luís Alpoim, Alexandre Silva and Cristina Santos
D24	Monitoring System for Emergency Service in a Hospital Environment	Adriana Reis, Fernanda Coutinho, João Ferreira, Cláudia Tonelo, Luis Ferreira and João Quintas
D25	Biomechanics: Analysis of Human Movement. Temporal Classification of Human Actions	Jessica Vital, Fernanda Coutinho, Micael Couceiro and Nuno Ferreira
D26	WPT system for implantable devices using a phased array and tracking algorithm for freely moving rats	Ivo Colmiais, Hugo Dinis and Paulo Mendes
D27	Wireless powering and communication in RFCMOS 180 nm for implantable thermal neuromodulators	Vitor Silva and Paulo Mendes
D28	Electro-pneumatic Control of Soft Robotic Hand Prothesis Actuators	Hugo Almeida, Paulo Almeida, Tiago Azevedo and Mário Mendes
D29	Influence of Adipose Tissue in Myocardial Counts Using Attenuation Correction in SPECT/CT imaging: Study in Phantom	Tiago Galvão, João Roberto, Sérgio Figueiredo, Elisabete Carolino, Andreia Marques, Sophia Pintão and Lina Vieira
D30	Reference values for normalized residual activity in 99mTc-MAG3 renograms	Bianca Bento, Ana Isabel Santos and Lina Vieira
D31	Analysis Of Pupil Diameter To Access Programmers' Mental Effort	Ricardo Couceiro, Gonçalo Duarte, João Durães, João Castelhano, Catarina Duarte, César Teixeira, Miguel Castelo Branco, Paulo de Carvalho and Henrique Madeira
D32	Assessing Eeg Potential To Distinguish Software Code Complexity	César Teixeira, Júlio Medeiros, Ricardo Couceiro, João Castelhano, Miguel Castelo-Branco, Gonçalo Duarte, Catarina Duarte, João Durães, Henrique Madeira and Paulo de Carvalho
D33	Cardiopulmonary resuscitation support using accelerometer signals from the carotid	Diogo Jesus, Paulo Carvalho, Jens Muehlsteff and Ricardo Couceiro

D34	A Framework for Timing Analysis of a BluetoothPiconet in Rehabilitation Monitoring Context	Joana Fonseca, Vanessa Ramos, J. Pedro Amaro, Fernando Moita and Luis Roseiro
D35	Framework for Knee Joint Movement Analysis with Inertial Sensors and Recursive Filters	Joana Fonseca, Vanessa Ramos, J.Pedro Amaro, Fernando Moita and Luis Roseiro
D36	Emerging CMOS Capacitive Sensors for Cellular Analysis: Recent Progresses and Future Prospects	Ebrahim Ghafar-Zadeh
D37	A Study on Compression Techniques for off-the-person Electrocardiogram Signals	António Cerca, André Lourenço and Artur Ferreira
D38	Biking with Heart - a case study on daily life ECG monitoring while riding a bike	Andre Lourenço, Carlos Carreiras, Tiago Mateus, Ricardo Rodrigues, David Velez, Duarte Matos and Roberto de Souza
D39	Device for Testing ECG Acquisition in Noisy Environments	Daniel Almeida, André Lourenço and Joao Ramos Da Costa
D40	In-shoe Sensor System with an Embedded User Interface and Wearable Leg Unit	Joao Ramos Da Costa and Inês Lourenço
D41	Desing and Development of an Optimized Output Stage for Electrical Stimulation	Richard Anthony Huamani Reategui, Bruno Adolfo Castillo Sotelo, Marcelo De Jesús Delgado Del Carpio, Juan Andrés Montoya Angulo and Meliza Fabiola Madueño Tica
D42	Heart rate variability study in young subjects under stress conditions	Pedro Sampaio, Argentina Leite, Luís Pereira, Juan Martínez and José Vasconcelos
D43	Development Of An Unsupervised Analysis Pipeline For Human Microelectrode Recordings	Sara Abalde, Gonçalo Marques, Marcelo Mendonça, Ricardo Matias, Raquel Barbosa, Alexandra Seromenho-Santos, Pedro Pires, Carla Reizinho, Paulo Bugalho and Chlo Movement Disorders Surgery Group
D44	Evaluation Of Image Quality In Magnetic Resonance Colangiopacreatography After The Use Of Black Tea As Negative Oral Contrast Agent	Justina Carvalho, Duarte Freitas and Luis Freire

THERMAL COMPUTATIONAL MODEL TO PREDICT THERMAL NECROSIS IN BONE SARCOMAS

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KEYWORDS: *Bone Tumor, Sarcoma, Cement*

ABSTRACT: Bone and soft tissue sarcomas are heterogeneous tumors that form from bone tissue, connective tissue, cartilaginous tissue, muscle tissue, adipose tissue, peripheral nerves, and blood vessels, usually at its extremities. Cementoplasty is a technique used for example in percutaneous procedures such as vertebroplasty, kyphoplasty, osteoplasty and sacroplasty [1]. Bone cements are synthetic biomaterials composed of a polymer (powder) and a liquid component (monomer), used very successfully in various medical applications. One of the main applications of bone cements is the fixation of prostheses by filling the free space between the prosthesis and the bone. The most frequently used bone cements are acrylics, namely PMMA (polymethylmethacrylate), due to their structural, physical properties, excellent biocompatibility, easy handling and low cost. One of the disadvantages is the development of thermal necrosis in the tissues during the cement polymerization process. PMMA has an exothermic reaction in which the volumetric dimension changes during the polymerization process with the heat generation [2]. In this work, the main objective is to evaluate the minimization of the evolution of bone sarcomas through the injection of PMMA cement ampoules in filling the space of the lytic tumor lesion. This methodology allows to verify at the adjacent cement - tissue interface, an increase in temperature that could minimize the growth of bone metastasis. Different computational models, obtained by medical image evaluation, will be carried out for analysis groups (gender, age, affected organ and associated pathology). The computational model allows a transient thermal analysis using the finite element method. The temperature results may determine the thermal necrosis effect in the injured bone tissue. Results will be compared using different commercial bone cements.

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[2] Surname Pérez M. A., Nuño N., Madrala A., García-Aznar J. M., Doblaré M. Computational modelling of bone cement polymerization: Temperature and residual stresses. Computers in Biology and Medicine, 2009; 39: 751-759.