IFMBE

MEDICON

COIMBRA 2019

XV MEDITERRANEAN CONFERENCE ON MEDICAL AND BIOLOGICAL ENGINEERING AND COMPUTING

COIMBRA 26-28 SEP 2019

Index

MEDICON COIMBRA 2019

WELCOME

It is our great pleasure and honour to welcome you all to MEDICON2019, the 15th Mediterranean Conference on Medical and Biological Engineering and Computing. For the first time a MEDICON conference takes place in Portugal and will be hosted by a UNESCO World Heritage University, the University of Coimbra.

Patient empowerment has emerged as a new paradigm that positions the patients at the heart of the health system and encourages them to be actively involved in managing their own healthcare needs. Effective patient empowerment requires a holistic approach, combining multiple dimensions of needs and patient contexts. Medical and Biological Engineering, as well as Computing, are disciplines at the heart of patient empowerment. Research and development in these areas are impacting science and technology by advancing fundamental concepts in translational medicine and understanding in human physiology, function and behaviour at multiple levels.

This is leading to improved tools and techniques for the detection, prevention, treatment and management of diseases. MEDICON2019 provides a common platform for the cross fertilization of ideas, and to help shape knowledge and scientific achievements by bridging complementary disciplines into an interactive and attractive forum under the special theme of the conference: “Improving healthcare through holistic patient empowerment”.

The University of Coimbra and the city are happy to receive you and we hope that you will enjoy it.

Welcome to MEDICON2019 and welcome to Coimbra!

The General Chairs

Paulo de Carvalho, Mário Forjaz Secca

FLOOR PLANS

R Registration - Bilheteira Antiga Igreja / Claustros

1 Antiga Igreja

2 C1D - Conventual

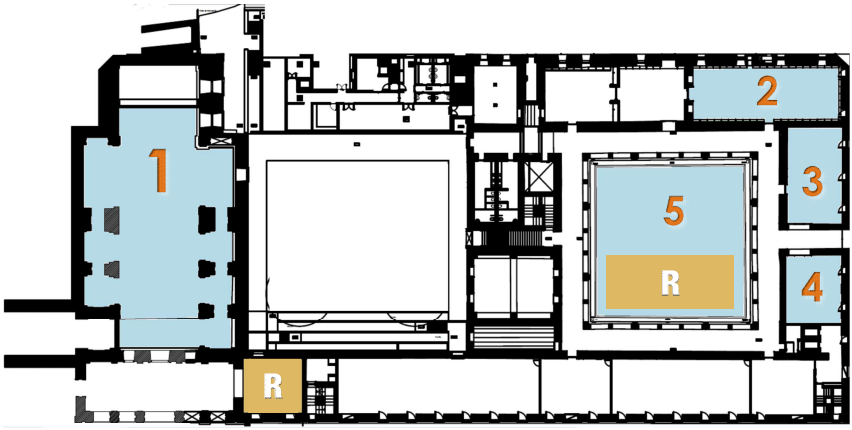
3 C1E - Inês de Castro

4 C1F - Dom Pedro

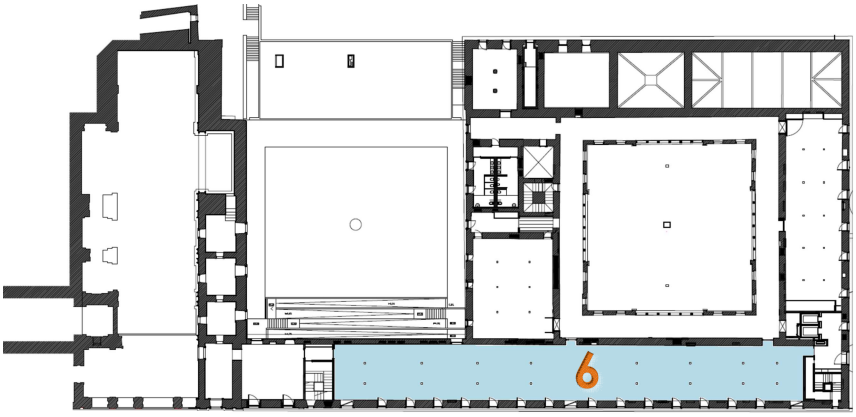
5 Claustros

6 C2A - Mondego

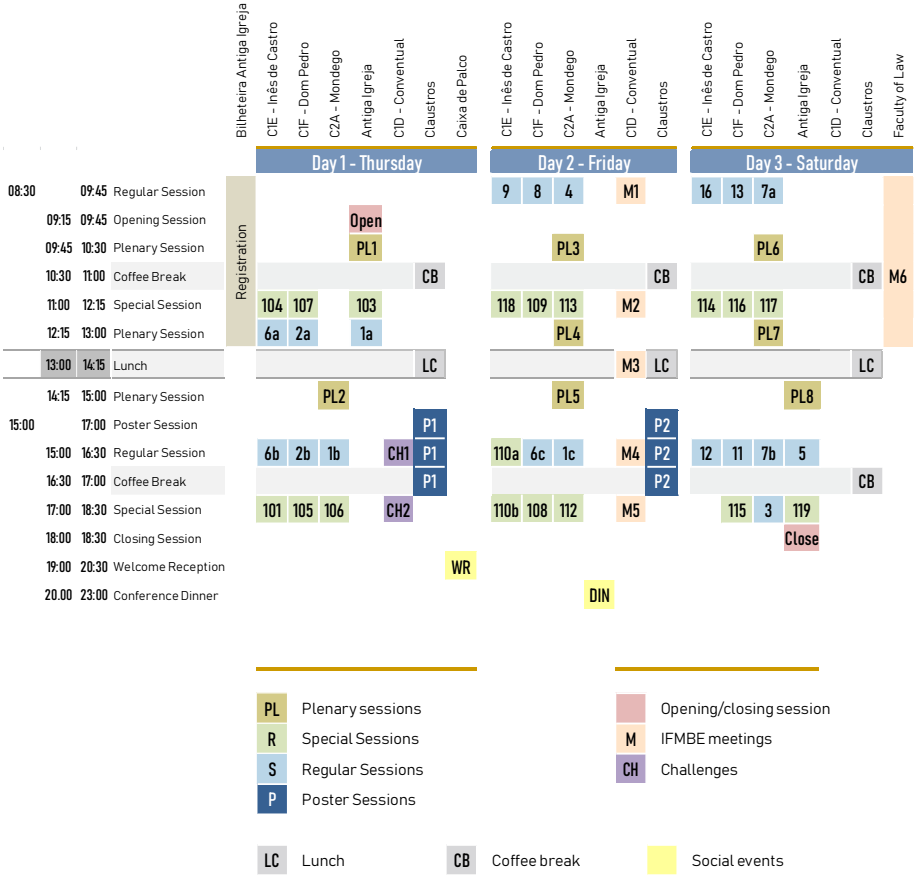
First floor



Second floor



PROGRAMME OVERVIEW



Opening and Closing Sessions

Open	Opening Session	Thursday	09:15	09:45	Antiga Igreja
Close	Closing Session and Award Ceremony	Saturday	18:00	18:30	Antiga Igreja

Plenary Sessions

PL1	Aart van Halteren	Thursday	09:45	10:30	Antiga Igreja
PL2	Adélia Sequeira	Thursday	14:15	15:00	C2A – Mondego
PL3	Sergio Cerutti	Friday	09:45	10:30	C2A – Mondego
PL4	Slavik Tabakov	Friday	12:15	13:00	C2A – Mondego
PL5	Luis Kun	Friday	14:15	15:00	C2A – Mondego
PL6	Rui Bernardes	Saturday	09:45	10:30	C2A – Mondego
PL7	Vicente Traver	Saturday	12:15	13:00	C2A – Mondego
PL8	Dimitrios Fotiadis	Saturday	14:15	15:00	Antiga Igreja

Poster Sessions

P1	Poster Session 1	Thursday	15:00	17:00	Claustros
P2	Poster Session 2	Friday	15:00	17:00	Claustros

IFMBE Meetings

M1	Memorial Niilo Saranummi	Friday	08:30	09:45	C1D – Conventual
M2	IFMBE meeting	Friday	11:00	12:15	C1D – Conventual
M3	Meeting the Editors	Friday	13:00	14:15	C1D – Conventual
M4	IFMBE EU-AF CoS Meeting	Friday	15:00	16:30	C1D – Conventual
M5	IFMBE Health Informatics and eHealth Working Group Meeting	Friday	17:00	18:30	C1D – Conventual
M6	IFMBE 60th Anniversary	Saturday	09:30	13:00	Law Faculty – Polo I

Challenges

CH1	Fraunhofer Best Portuguese PhD/MsC Thesis competition in Biomedical Engineering	Thursday	15:00	16:30	C1D – Conventual
CH2	IFMBE Health Informatics Scientific Challenge Competition	Thursday	17:00	18:30	C1D – Conventual

Social Events

WR	Welcome Reception	Thursday	19:00	20:30	Caixa de Palco
DIN	Conference Dinner	Friday	20:00	23:00	Antiga Igreja

Special Sessions

101	Optimization in medicine and biology	Thursday	17:00 -18:30	C1E – Inês Castro
103	Electronics and smart algorithms for the effective lung monitoring and COPD management	Thursday	11:00 -12:15	Antiga Igreja
104	Non-invasive temperature assessment using ultrasound	Thursday	11:00 -12:15	C1E – Inês Castro
105	Computational biology and medical applications	Thursday	17:00 -18:30	C1F – Dom Pedro
106	Smartphone based, patient-centred technologies	Thursday	17:00 -18:30	C2A – Mondego
107	Computational and experimental modelling for designing bone implant systems	Thursday	11:00 -12:15	C1F – Dom Pedro
108	Artificial organs: extracorporeal blood circulation medical devices	Friday	17:00 -18:30	C1F – Dom Pedro
109	Diabetes and cardiovascular diseases: Ibero-American trends	Friday	11:00 -12:15	C1F – Dom Pedro
110	Smart robotic assistant for minimally invasive surgery: the SMARTsurg project experience	Friday Friday	15:00 -16:30 17:00 18:30	C1E – Inês Castro C1E – Inês Castro
112	INT4DAT - Intelligent systems and technologies for diagnostic, assistance, and therapeutics	Friday	17:00 -18:30	C2A – Mondego
113	Upper limb exoskeletons for a better quality of life: what is real, what is useful, and what is next	Friday	11:00 -12:15	C2A – Mondego
114	Neuro systems and connectivity	Saturday	11:00 -12:15	C1E – Inês Castro
115	Therapeutic applications of imaging and neuro stimulation	Saturday	17:00 -18:00	C1F – Dom Pedro
116	Value-based health technology assessment	Saturday	11:00 -12:15	C1F – Dom Pedro
117	International collaborative on medical devices assessment	Saturday	11:00 -12:15	C2A – Mondego
118	Ocular Imaging	Friday	11:00 -12:15	C1E – Inês Castro
119	Assessing human error in cognitive/intellectual demanding tasks: case study on software engineering	Saturday	17:00 -18:00	Antiga Igreja

Regular Sessions

01	Biomedical signal processing	Thursday	12:15-13:15	Antiga Igreja
		Thursday	15:00-16:30	C2A – Mondego
		Friday	15:00-16:30	C2A – Mondego
02	Biomedical imaging & image processing	Thursday	12:15-13:15	C1F – Dom Pedro
		Thursday	15:00-16:30	C1F – Dom Pedro
03	Bioinstrumentation, biosensor's & bio-micro/nano technologies	Saturday	17:00-18:00	C2A – Mondego
04	Bioinformatics, computational biology and systems biology	Friday	08:30-09:45	C2A – Mondego
05	Biomechanics, robotics and rehabilitation	Saturday	15:00-16:30	Antiga Igreja
06	Therapeutic and diagnostic systems, devices and technologies & Clinical engineering	Thursday	12:15-13:15	C1E – Inês Castro
		Thursday	15:00-16:30	C1E – Inês Castro
		Friday	15:00-16:30	C1F – Dom Pedro
07	Information technology in health systems	Saturday	08:30-09:45	C2A – Mondego
		Saturday	15:00-16:30	C2A – Mondego
08	Assistive technologies	Friday	08:30-09:45	C1F – Dom Pedro
09	Technologies for active ageing	Friday	08:30-09:45	C1E – Inês Castro
11	Clinical engineering and health technology assessment	Saturday	15:00-16:30	C1F – Dom Pedro
12	Neuro engineering, neuro systems	Saturday	15:00-16:30	C1E – Inês Castro
13	Technologies for preventive healthcare	Saturday	08:30-09:45	C1F – Dom Pedro
16	Biomaterials and tissue engineering	Saturday	08:30-09:45	C1E – Inês Castro

PLENARY SESSIONS

Plenary Sessions

PL1	Aart van Halteren Digitally empowered patients	Thursday Antiga Igreja	09:45-10:30
PL2	Adélia Sequeira Cardiovascular modelling and simulations. Applications to some clinical studies	Thursday C2A –Mondego	14:15 – 15:00
PL3	Sergio Cerutti Biomedical signals and images processing: towards innovative paradigms of information integration in the era of precision medicine and big data in health	Friday C2A –Mondego	09:45 – 10:30
PL4	Slavik Tabakov Multilingual dictionary of medical physics terms-update and relevance for clinical engineering	Friday C2A –Mondego	12:15 – 13:00
PL5	Luis Kun Prevention engineering: evolving challenges for biomedical and clinical engineering	Friday C2A –Mondego	14:15 – 15:00
PL6	Rui Bernardes Optical coherence tomography: a window into the mechanism of neurodegenerative disorders	Saturday C2A –Mondego	09:45 – 10:30
PL7	Vicente Traver Towards a value based healthcare system supported by process mining techniques	Saturday C2A –Mondego	12:15 – 13:00
PL8	Dimitrios Fotiadis In silico clinical trials: towards transforming the biomedical industry and the healthcare delivery	Saturday Antiga Igreja	14:15 – 15:00

Thursday, September 26

09:45-10:30

Aart van Halteren
Philips Research Eindhoven , The Netherlands

Aart van Halteren is a principal scientist at Philips Research Eindhoven and a professor at Vrije Universiteit Amsterdam.
He explores the boundaries of large scale, distributed techno-social systems for measuring, reasoning and influencing human behaviour. His work finds application in the area of healthy eating and adherence to a personalized physical activity program.
In the healthcare space he delivers solutions for patient activation, virtual coaching and therapy adherence of chronic patients.

Room | Antiga Igreja

Chair | Ratko Magjarevic

Digitally empowered patients

Some have said that the patient is the largest and most underutilized resource in healthcare.
Chronic disease management programs aim to improve healthcare outcomes, reduce healthcare expenditure while improving quality of life by patient centric care. Smart algorithms can identify the persons at risk for one or more chronic conditions followed by a systematic care plan that promotes self-management by patients and address the illnesses or conditions with optimized clinical outcome.
Unfortunately, not every patient benefits from these programs. The variation is huge, although on average patients benefit from these programs, for some patients it seems to have very little impact. A patients' capability to self-manage, the level of activation and engagement are important pre-requisites for a patient to benefit from a program.
How can a patient be optimally engaged to yield the most benefit from a care program?
Delivering personalized digital tools for activating a patient will enable the patient and care team to jointly achieve the care program objectives. In this talk we discuss the establishment of Health Behaviour Profiles as an important step for personalized and continuously tailored patient activation. Health Behaviour Profiles are individualized data structures that can be used to indicate non-adherence risk and barriers to self-management. Health Behaviour Profiles can also be used to personalize care pathways in such a way that barriers are avoided and risk reduced.

Thursday, September 26

14:15-15:00

Adélia Sequeira
Instituto Superior Técnico, Portugal

Adélia Sequeira is Full Professor of Mathematics at the IST (Instituto Superior Técnico), University of Lisbon in Portugal and Director of the Research Center on Computational and Stochastic Mathematics. She received her Doctoral Degree in Numerical Analysis in 1981, at École Polytechnique in Paris, France, and a second Doctoral degree in Mathematics in 1985, at the Faculty of Sciences of the University of Lisbon. In January 2001 she received from IST the Habilitation degree in Applied Mathematics and Numerical Analysis. In November 2018 she was elected corresponding member of the Lisbon Academy of Sciences, Class of Sciences.
In 2019 she was selected as a "Women in Science" by the Portuguese Agency of Science and Technology "Ciência Viva",
http://www.cienciaviva.pt/mulheresnaciencia/index.asp

Currently, her research interests are in the area of cardiovascular mathematical modelling and simulations of closely connected problems of clinical relevance associated with vascular diseases: patient-specific cerebral aneurysms progression; biomechanical and biochemical actions in blood vessels, with application to thrombosis and atherosclerosis processes. She is also interested in mathematical and computational fluid dynamics, particularly focused on viscoelastic non-Newtonian fluids and on hemorheology and hemodynamic studies.

Room | C2A - Mondego

Chair | Paula Oliveira

Cardiovascular modelling and simulations. Applications to some clinical studies

Cardiovascular diseases, such as heart attack and strokes, are the major causes of death in developed countries, with a significant impact in the cost and overall status of healthcare. Understanding the fundamental mechanisms of the pathophysiology and treatment of these diseases are matters of the greatest importance around the world. This gives a key impulse to the progress in mathematical and numerical modelling of the associated phenomena governed by complex physical laws, using adequate and fully reliable in silico settings.

The acquisition of medical data and the understanding of the local hemodynamics and its relation with global phenomena, in both healthy and pathological cases, using appropriate mathematical models and accurate numerical methods, play an important role in the medical research. They help, for instance, in predicting the consequences of surgical interventions, or in identifying regions of the vascular systems prone to the formation and growth of atherosclerotic plaques or aneurysms. The growing collaboration between scientists working in multidisciplinary areas such as medical researchers and clinicians, mathematicians and bioengineers has contributed to data information exchange that can be used in the numerical simulations. Although many substantial achievements have been made, most of the difficulties are still on the ground and represent major challenges for the coming years. The final goal is to setup patient-specific models and simulations incorporating data and measurements taken from each single patient, that will be able to predict results of medical diagnosis and therapeutic planning with reasonable accuracy and using non-invasive means.

In this talk we describe some mathematical models of the cardiovascular system and comment on their significance to yield realistic and accurate numerical results, using stable, reliable and efficient computational methods. They include fluid-structure interaction (FSI) models to account for blood flow in compliant vessels and the geometrical multiscale approach, using appropriate boundary conditions, to simulate the reciprocal interactions between local and systemic hemodynamics. Results on the simulation of some image-based patient-specific clinical cases will also be presented.

Friday, September 27

09:45-10:30

Sergio Cerutti

Politecnico di Milano, Italy

Dr. Cerutti is Professor in Biomedical Engineering at the Department of Electronics, Information and Bioengineering at the Politecnico in Milano (since 1994), where he is also Chairman of the B-cube Laboratory (Biosignals, Bioimaging and Bioinformatics) in the same Department. From 1990 to 1994 he has been Professor of Biomedical Engineering at the Department of Computer and System Sciences of the University of Rome "La Sapienza". He has been Chairman of the Bachelor Track (Diploma Universitario) in Biomedical Engineering of the Politecnico in the period 1996-2000. In the period 2000-2006 he has been Head of the Department of Bioengineering of the same Politecnico. In the period 2010-2012 he has been Chairman of the Programs of Biomedical Engineering (1st and 2nd level Degrees) at Politecnico.

His research activity is mainly dedicated to various aspects of biomedical signal and data processing and modelling related to the cardiovascular system and in the field of neurosciences. He is the Author of more than 600 indexed international scientific contributions (about 300 on indexed scientific journals). He has coordinated various research projects at national and international levels in various topics of Biomedical Engineering and Bioinformatics.

He spent over a year as a Visiting Professor at the MIT and Harvard School of Public Health, Boston MA, USA, as well as a period of 3 months at the Department of Physics of the IST (Instituto Superior Tecnico), Technical University in Lisbon, Portugal.

He is Chairman of the Italian IEEE Chapter on Engineering in Medicine and Biology and also Chairman of the Biomedical Engineering Group of Italian AEIT (Association of Electrical Engineering and Telecommunication). Further, he is Chairman of the Ethical Committees of IEO (European Institute of Oncology) and Cardiological Center "Monzino" in Milano.

He is a Fellow member of IEEE, AIMBE and EAMBES and member of other international and national scientific associations.

Room | C2A - Mondego

Chair | Constantinos Pattichis

Biomedical signals and images processing: towards innovative paradigms of information integration in the era of precision medicine and big data in health

A holistic vision of the patient requires new paradigms of investigations in respect to the traditional reductionistic approach typical of classical clinical medicine studies and interventions which consider separately each organ or system, along the way how specialisation medical schools are generally organised.
Instead, the new methods and technics which come from the incredible innovation process of biomedical technologies should facilitate the information integration among the different single organs, the modalities on which information is transferred and the various scales on which the same phenomenon or pathology could be studied.
The processing of clinical information as well as the extraction of proper features characterising the patient plays a pivotal role towards the so-called “precision medicine” or “personalised medicine”, even in this case by providing an innovative approach of the so-called “protocol-based” or “evidence-based medicine”.

Friday, September 27

12:15-13:00

Slavik Tabakov
King's College Hospital and King's College London, UK

Prof Slavik Tabakov is Vice-President of the International Union for Physical and Engineering Sciences in Medicine – IUPESM (the Union between IOMP and IFMBE). He was Officer of the International Organization for Medical Physics (IOMP) from 1997 and President of IOMP in the period 2015-2018. Prof S.Tabakov started his career at Medical University Plovdiv, Bulgaria, where he habilitated in 1990. Since 1991 he works at King's College Hospital and King's College London (KCL), UK. He is the Founding Director of the largest European MSc programmes in the profession – MSc Clinical Sciences (Medical Physics) and MSc Clinical Sciences (Clinical Engineering) at KCL. He is also Co-Director of the International College on Medical Physics, ICTP, Trieste, Italy. Prof S.Tabakov has led 7 international projects, which developed the first e-learning in medical physics, the first Medical Physics Dictionary (translated to 29 languages) and the first e-Encyclopaedia of Medical Physics (www.emitel2.eu). He is also Founding Co-Editor in Chief of the IOMP Journal Medical Physics International. He has Chaired the Education and Training Committees of IOMP, IFMBE and IUPESM, and has advised the development of 15 MSc courses in Europe, Asia and Latin America. Among his awards are the EU Leonardo Da Vinci Award and the IOMP Harold Johns Medal for Excellence in Teaching and International Education Leadership.

Room | C2A - Mondego
Chair | Mário Forjaz Secca

Multilingual dictionary of medical physics terms – update and relevance for clinical engineering

INTRODUCTION: The Multilingual Dictionary of Medical Physics Terms was initially created as a free resource to support the education and training of colleagues from Low and Middle Income (LMI) Countries. A typical professional pattern in these countries is that medical physicists often perform the duties of clinical engineers and vice-versa. This way the Dictionary was made to include many engineering/technical terms related to radiotherapy and medical imaging (X-ray, Ultrasound, Nuclear Medicine, Magnetic Resonance and other related equipment) – www.emitdictionary.co.uk. The current update follows the same idea. The Dictionary is now linked with the Medical Physics e-Encyclopaedia EMITEL (www.emitel2.eu), thus forming a one-stop reference point on the subject.

METHODS: The Dictionary project development passed through several stages: development of Thesaurus, parallel translation to various languages; refereeing. A specific system was developed (based on unique identifications, related to the English terms), which allows cross-translation between any of the existing 30 languages. The current project for Dictionary Update keeps this system, but extends the number of terms, as these medical devices develop very rapidly. The initial teams of translators (from various countries) translates the terms in their respective language, using own standardized system.

RESULTS: The initial Dictionary project was developed mainly on-line and included parallel work of more than 200 specialists from 36 countries. A total of 3,100 terms are included in the initial Thesaurus in English. These now exist in 30 languages (9 alphabets): English, French, German, Italian, Swedish, Spanish, Portuguese, Bulgarian, Czech, Greek, Hungarian, Lithuanian, Polish, Estonian, Romanian, Turkish, Latvian, Russian, Thai, Arabic, Iranian, Bengal, Slovenian, Malay, Chinese, Croatian, Japanese, Korean, Finnish, Georgian. The new Update project uses the already prepared system and existing website. The new terms to be included cover both the new terms in medical imaging and radiotherapy equipment, and terms related to medical equipment management. The latter was a results from the feedback of many colleagues from LMI countries, who perform both functions - elated to medical physics and clinical engineering. The new project simultaneously updates the Thesaurus, the translation of the terms and the encyclopaedic articles, related to these (as part of the parallel project of Encyclopaedia Update). The official website statistics shows more than 7,000 users per month, most of these from Europe and Asia. The Multilingual Dictionary is finding a sound place in the educational courses in LMI countries, as most of the new terminology comes from English.

CONCLUSION: The Multilingual Dictionary is an international collaborative work. The on-line method of work, the unique system and the specially made website work flawlessly for a number of years. The Dictionary is a free resource, used by thousands of colleagues each month. This helps the professional development in LMI countries. The usefulness of the Multilingual Dictionary was one of the main reasons for the EU Leonardo Da Vinci Award, received by the team of the initial project EMIT (Coordinator S. Tabakov). The current Update project includes more terms relevant to clinical engineers. The experience from this project could help forming further references related to Biomedical Engineering.

Friday, September 27

14:15-15:00

Luis Kun

National Security at Center for Hemispheric Defense Studies (CHDS) at NDU

Dr. Kun graduated from the Merchant Marine Academy in Uruguay and holds a BSEE; MSEE and Ph.D. degree all from UCLA. A (Lifetime) Fellow of the IEEE, the American Institute for Medical and Biological Engineering, and the International Academy of Medical and Biological Engineering. He is a Distinguished Professor Emeritus of National Security Affairs (CHDS) and was Professor of Homeland Security at the National Defense University (2003-2015). He is Editor in Chief of Springer's Journal of Health and Technology. He spent 14 years at IBM; was Director of Medical Systems Technology at Cedars Sinai Medical Center. As Senior IT Advisor to AHCPR he formulated the IT vision and was the lead staff for High Performance Computers and Communications program and Telehealth. In July 1997, as invited speaker to the White House, he was largely responsible for the first Telemedicine Homecare Legislation signed by President Clinton, August 1997. Represented the DHHS Secretary at a Forum of Health Care Ministers on Telecommunications and the Health Care Industry in Mexico. While a Distinguished Fellow at the CDC, as Acting Chief IT Officer for the National Immunization Program he formulated their IT vision on 10/2000. Kun received many awards including: AIMBE's first-ever Fellow Advocate Award in 2009; IEEE-USA Citation of Honor Award, "For exemplary contributions in the inception and implementation of a health care IT vision in the US." 2011 Golden Core Award by the IEEE CS. Named: "Profesor Honoris Causa" Favaloro University, (Argentina); "Distinguished Visitor" by City of Puebla, Mexico (2013). He is/was in the IEEE Distinguished Visitor Program for the CS, Distinguished Lecturer for the EMBS and the DL SSIT Chair. (2014) Honorary Professor of the Electrical Engineering Dept. at the School of Engineering of the University (UDELAR) in Montevideo, Uruguay. He received the Medal of Merit on October 20, 2016 in Mexico by the National Unit of Engineering Associations and named Visiting Professor by the National Technological University of Buenos Aires, Argentina, November 2017.

Room | C2A - Mondego

Chair | Nicos Maglaveras

Prevention engineering: evolving challenges for biomedical and clinical engineering

Advances in computing, information and communications technology provide a unique opportunity to develop mechanisms that may lower the cost of healthcare through prevention while improving the quality of life. Prevention of non-communicable disease will require the use of intelligent agents to alert individuals of potential risks based on their DNA, and available solutions to decrease those risks altogether.

Another form of prevention could be done by: silencing, activating or editing genes; disactivating cancer cells; and or correcting genetic defects. Prevention of communicable diseases will require the effective use of information and communication networks to alert the population, while neutralizing mosquitos of Malaria, Dengue, West Nile Virus or Yellow Fever; neutralizing infections, virus, HIV, etc., can also play a major role.

Shifting from a disease centric system to one that focuses on wellness, requires a strategy on prevention since many ethical issues are raised by the potential uses of these new technologies. Our US (electronic) health records for example, are islands of information not fully accessible, integrated or interoperable. Semantically speaking we are addressing multiple different types of prevention. Medical errors, such as surgical site infections account for as many as 300 K cases per year in the US. Preventable medical errors are the third leading cause of death (440,000) in the United States, after heart disease and cancer.

Saturday, September 28

09:45-10:30

Rui Bernardes
University of Coimbra

Assistant Professor at the University of Coimbra (Institute of Biophysics and Biomathematics), Portugal.
His background consists in a Licensure in Electrical Engineering, a Master degree in Biomedical Engineering and a PhD degree in Health Sciences. He works for over 10 years in diabetic retinopathy, developing imaging modalities as the Retinal Leakage Analyser (RLA), a functional imaging system for measuring the permeability of the blood-retinal barrier (BRB), in vivo, and on Multimodal Macula Mapping (MMM), the integration of different imaging modalities to establish relations between different parameters, either morphologic or functional ones, from the human retina.
His contributions led already to the establishment of phenotypes of progression of diabetic retinopathy, and a risk marker for the development of diabetic retinopathy to CSME eyes needing photocoagulation based on the fusion of structure and function data.
He also contributed actively to the development of a quantization process of fluorescence of sodium fluorescein in the human eye, both in serum and vitreous, being this work patented ("Method and apparatus for measuring quantity of a fluorochrome in a biological environment.". World Intellectual Property Organization. WO 2008/067525 A2, July 5, 2008).
He has been contributing to several national research projects, funded by the national "Fundação para a Ciência e a Tecnologia (FCT)", as well as in European research projects like the GLAUCAD (Glaucoma Prevention by Computer Aided Diagnostics), EVIGeM (European Virtual Institute for Geometry Measurements) and EVI-GENORET (European Vision Institute – Functional Genomics of the Retina in Health and Disease).
Collaborations with industry include companies as Pfizer Inc. (Groton, CT, USA), Carl Zeiss Meditec (Dublin, CA, USA), Thermofisher (Portsmouth, NH, USA) and Critical Software (Coimbra, Portugal).

Room | C2A – Mondego

Chair | Miguel Castelo-Branco

Optical coherence tomography: a window into the mechanism of neurodegenerative disorders

Over 75 million people are expected to live with dementia in 2030 according to estimates from the World Health Organization (WHO) made in 2015. Alzheimer's disease alone is estimated to represent 60% to 80% of the cases.
Imaging the brain is not cheap or possible to this number of people, let alone for population screening. In consequence, an increasing number of research groups adopted the approach of using the retina as a window to the brain. Besides being the visible part of the central nervous system, the retina is readily available through non-invasive imaging techniques. Moreover, there is cumulative evidence indicating that the retina can also be affected by neurodegenerative diseases.
This talk will cover historical and state-of-the-art developments in one of the techniques toward ocular imaging with the highest impact in the last decades, the optical coherence tomography (OCT). It will show the course of innovation since the coarse retinal imaging to the application of imaging the central nervous system, in situ and in vivo, with the ability to potentially shed light on neurodegenerative disorders.
Recent advances using human data and data from animal models of Alzheimer's disease show the parallel concerning the natural history of disease progression. The development of biomarkers of disease and disease progression and the use of machine learning approaches towards the identification of individuals within asymptomatic stages of neurodegeneration and the differences to the healthy aging will be discussed.

Saturday, September 28

12:15-13:00

Vicente Traver

Universitat Politècnica Valencia, Spain

Vicente Traver - MSC (1998) and Ph.D. (2004) in Telecommunications Engineering by Universidad Politécnica de Valencia IEEE- EMBS member. Associate Profesor of Biomedical Engineering at the Universidad Politécnica de Valencia. General Manager of the Innovative Technologies for Health & Wellbeing (SABIEN) group at the ITACA Institute. Member of the Academic Board for the interuniversity Master on Biomedical Engineering at Valencia. Coordinator of the cluster Healthy Living, which combines six different R&D university groups working in the field from different approaches. Since 1998, his research focus is telemedicine, e-health and e-inclusion, especially on the provision of home health care services through ICT and the concepts of the patient empowerment and the citizen as health co-producer. He has participated in more than 40 EU funded projects (from IV till Horizon2020), Spanish funded projects and taken part in multiple research agreements with companies, dealing most of them with health care and social services making use of ICT.
He has published more than 100 publications in national and international journals and has participated in several seminars and conferences as invited speaker. Member of several international scientific congress committees. Conference cochair of the IEEE Biomedical Health Informatics 2014. Member of the Editorial Board of International Journal of Distributed Sensor Networks. Associate member of the IEEE EMBS - Wearable Biomedical Sensors and Systems (WBSS) Committee. Cofounder of 2 SME IT health related companies. Responsible of EU reference site in the Valencia region about Active and Healthy Ageing (EIP-AHA initiative). List of publications available in goo.gl/Wg2JZR

Room | C2A – Mondego

Chair | Miguel Coimbra

Towards a value based healthcare system supported by process mining techniques

The concept of Value-based healthcare is patient centered, aiming at ensuring the best health outcomes and experience for a patient. To perform a true assessment of value, both the organizational cost and the perspective of the healthcare professional needs to be taken into account. The transformation to patient centered and value based healthcare must be supported by digital transformation guided by real and actual clinical and organizational needs.

Process mining solutions take into account the inputs from the different users to generate changes in the way things are happening from a value based perspective. Dr. Traver will explain how through process discovery, conformance and enhancement activities and following a question based methodology, clinicians are using such techniques to improve patient outcomes in their daily practice, making viable a value based healthcare system.

Saturday, September 28

14:15-15:00

Dimitrios Fotiadis

University of Ioannina, Greece

Dr. Fotiadis is Prof. of Biomedical Engineering and Director of the Unit of Medical Technology and Intelligent Information Systems (MEDLAB), University of Ioannina, Ioannina, Greece. Dr Fotiadis is the founder of MEDLAB, which now is one of the leading centers in Europe in Biomedical Engineering with activities ranging from the development of health monitoring systems to big data management and multiscale modelling. The Unit is an active center for many R&D projects and is considered as a center of excellence for human tissues modelling activities with international collaborations with the research community, industry and public organizations. Dr Fotiadis is affiliated researcher of the Biomedical Research Dept. of the Institute of Molecular Biology and Biotechnology, FORTH, and member of the board of Michailideion Cardiac Center.

Dr. Fotiadis' main research interests include wearable systems, multiscale modelling and intelligent processing of medical and related data. He developed wearable systems for the monitoring, treatment, motivation and coaching for patients with neurodegenerative diseases and other chronic conditions. Those systems combine a set of sensors and biosensors with decision making tools and patient/ecosystem feedback, as well as behavioural models and patient adherence mechanisms. In modelling, he developed multiscale models for the prediction of atheromatic plaque growth, based on realistic reconstruction of arteries from various imaging modalities. He pioneered the modelling of complex human structures, such as bones, to perform in silico clinical trials of various biomedical systems. He employed machine learning techniques to develop predictive models for chronic diseases, exploiting medical, lifestyle, environmental, and genetic data which are integrated with existing knowledge and models to improve diagnostic and predictive accuracy. He works in the harmonization and integration of data from longitudinal cohorts.

Dr. Fotiadis is the recipient of many awards, including the Academy of Athens Award and active member of the IEEE Engineering in Medicine and Biology Society, being a member of the Technical Committee of Biomedical and Health Informatics and the Chairman of the IEEE EMBS Greek Chapter. Dr. Fotiadis coordinated the organization of many EMBS conferences and other events.

Room | Antiga Igreja

Chair | Riccardo Barbieri

In silico clinical trials: towards transforming the biomedical industry and the healthcare delivery

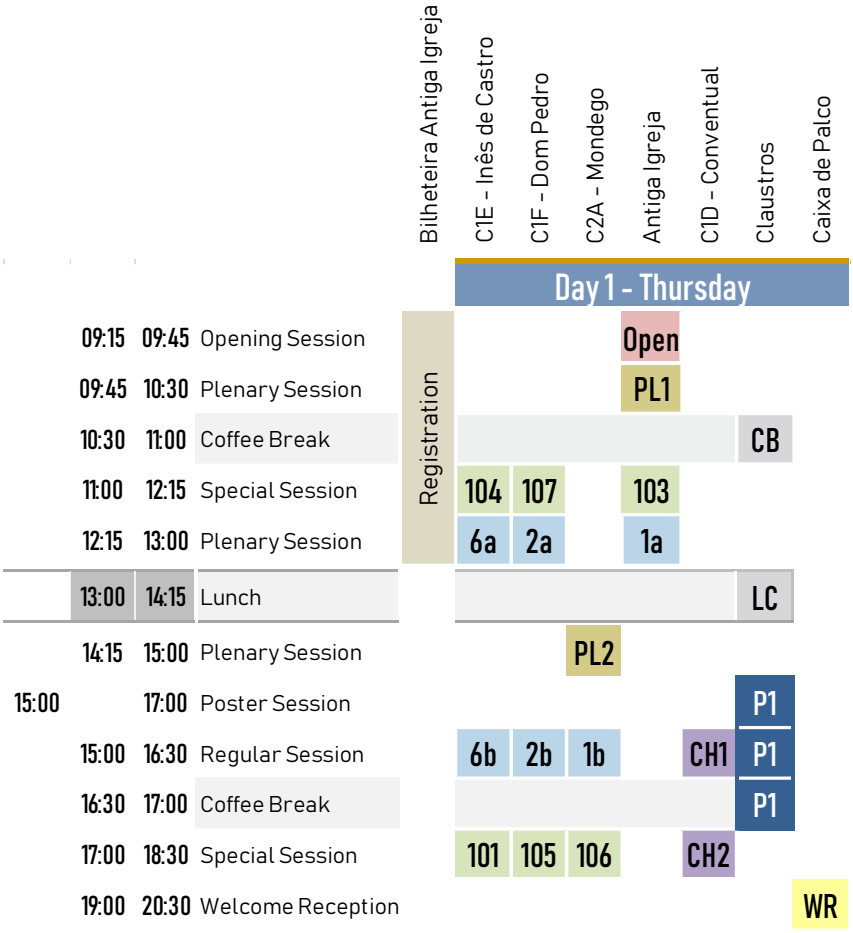
The process of designing, developing and assessing a medical device is time consuming and costly. The appropriate level of testing and evaluation, before the introduction in the market and commercialization, is of utmost importance, due to the potential associated patient risks. The identification of a safe and efficacious medical device involves the testing in the laboratory (in vitro), and then on living organisms, initially on animals (in vivo) and then on humans (clinical evaluation/trial). However, as a result of the complexity of human diseases, there is a substantial difference between individuals, while an inevitable variability in anatomy and pathology is observed.

In addition, while a medical device could perform well in controlled laboratory experiments and pre-clinical studies, several issues (eg. failure) could appear during or after clinical trials. In such case, there is no insight on the small modifications/improvements that could be implemented so as to achieve a better performance. Inevitable there is ample room for improving the complete design and development chain of medical devices towards reducing the animal and human testing, and addressing the imperfections of in vitro and in vivo predictions. Over the last decade, there has been a huge investment in in silico approaches through the incorporation of patient-specific computer models, that account on the comprehensive biological and biomedical knowledge and advanced modelling paradigms, mimic the complexity of human disease mechanisms and answer several difficult questions, such as: “Why do some patients react in a specific way to the implantation of a medical device, while others not?” In silico clinical trials will address the individual variability and evaluate how medical devices affect individual patients, while in parallel reduce the regulatory hurdles and refine the regulatory pathways for accelerating their approval and delivery to the market.

REGULAR and SPECIAL SESSIONS

@João Duarte

DAY 1 – Thursday, September 26



Opening Session

09:15 - 09:45 Opening Session

Plenary Sessions

09:45 -10:30 PL1 | Aart van Halteren

14:15 – 15:00 PL2 | Adélia Sequeira

Regular Sessions

12:15 – 13:15

1a | Biomedical signal processing

2a | Biomedical imaging & image processing

6a | Therapeutic and diagnostic systems, devices and technologies & clinical engineering

15:00 – 16:30

1b | Biomedical signal processing

2b | Biomedical imaging & image processing

6b | Therapeutic and diagnostic systems, devices and technologies & clinical engineering

Special Sessions

11:00 – 12:15

103 | Electronics and smart algorithms for the effective lung monitoring and COPD management

104 | Non-invasive temperature assessment using ultrasound

107 | Computational and experimental modelling for designing bone implant systems

17:00 – 18:30

101 | Optimization in medicine and biology

105 | Computational biology and medical applications

106 | Smartphone based, patient-centred technologies

Challenges

15:00 – 16:30 CH1 | Fraunhofer Best Portuguese PhD/MsC thesis competition in Biomedical Engineering

17:00 – 18:30 CH2 | IFMBE Scientific Challenge Competition

Poster Sessions

15:00 – 17:00 P1 | Poster Session 1

Social event

19:00 – 20:30 WR | Welcome Reception – Caixa de Palco

103 SPECIAL SESSION

11:00 | 12:15 Room | Antiga Igreja
Chairs | Nicos Maglaveras, Andreas Raptopoulos, Rui Paiva

103: Electronics and smart algorithms for the effective lung monitoring and COPD management

#253
A low-cost USB-compatible electronic stethoscope unit for multi-channel lung sound acquisition
Gürkan Yilmaz, Pierre Starkov, Mathilde Crettaz, Josias Wacker and Olivier Chételat

#255
Wearable electrical impedance tomography for the detection of regional lung volumes and ventilation
I. Frerichs, J. Wacker, R. Paradiso, C. Strodthoff and O. Chételat

#262
The WELCOME Overview and its Results
Andreas Raptopoulos and Rui Pedro Paiva

#263
Moving forward – H2020 WELMO Overview
Andreas Raptopoulos, Sophia Vasileiadou

#264
Personalized decision support for remote COPD patient monitoring
V. Kilintzis, N. Beredimas, I. Chouvarda, E. Perantoni, E. Kaimakamis, N. Maglaveras

#252
Feature Engineering for the Detection and Classification of Respiratory Sounds
Rui Pedro Paiva, Bruno Miguel Rocha, César Teixeira, Jorge Henriques and Paulo de Carvalho

104 SPECIAL SESSION

11:00 | 12:15 Room | C1E - Inês de Castro
Chairs | César Teixeira, André Alvarenga, Wagner Pereira

104: Non-invasive temperature assessment using ultrasound

#25
Effect of continuous application of heating-cooling cycles on ultrasonic attenuation of muscle tissue
Guillermo Cortela, Carlos Negreira and Wagner Pereira

#91
Metrological approach for characterizing ultrasonic properties of soft tissue-mimicking material
Raquel Souza, Mylena Assis, Rodrigo Costa-Félix and Andre Alvarenga

#221
Skin contribution to heating by ultrasonic field irradiation: simulation of a multilayer biological application
Wagner Coelho de Albuquerque Pereira, Thaís Pionório Omena and Eduardo Moreno

#218
Sensitivity study in High Intensity Focused Ultrasound therapy for Cancer
Laura De Los Ríos Cárdenas, Leonardo A. Bermeo Varón and Wagner Coelho Albuquerque Pereira

#222
Improving visual contrast between fat and muscle tissues in B-mode images using CBE: a simulation study
Mario Pastrana Chalco, Wagner Pereira and Cesar Teixeira

107 SPECIAL SESSION

11:00 | 12:15 Room | C1F – Dom Pedro
Chairs | Ana Amaro

107: Computational and experimental modelling for designing bone implant systems

#224
Experimental assessment of knee arthrodesis
Ana Amaro, Luis Roseiro, Maria Paulino and Maria Neto

#235
Implant-assisted removable partial dentures in mandibular Kennedy Class I patients: the impact of implant positioning
Ana Messias, Pedro Nicolau, Fernando Guerra, Ana Amaro, Luis Roseiro and Maria Neto

#247
Residual ridge resorption in mandibular Kennedy class I denture wearers: proposal of a pressure-induced mechanism based on a finite element analysis
Ana Messias, Pedro Nicolau, Fernando Guerra, Luís Roseiro, Ana Amaro and Maria Neto

#225
Numerical Evaluation of the Knee Arthrodesis Using a Modified External Fixator
Maria Neto, Luis Roseiro, Maria Paulino and Ana Amaro

#226
Finite Element Comparison of Two Implants for the Treatment of Unstable Trochanteric Femur Fractures
Maria Neto, Luis Roseiro, Maria Paulino and Ana Amaro

1a REGULAR SESSION

12:15 | 13:15 Room | Antiga Igreja
Chairs | Anna Bianchi, Ana Paula Rocha

01: Biomedical signal processing

#41
Using eye tracking to analyze surgeons' cognitive workload during an advanced laparoscopic procedure
Juan Francisco Ortega Morán, J. Blas Pagador, Vicente Luis del Campo, Juan Carlos Gómez Blanco and Francisco M. Sánchez Margallo

#143
Application of Multivariate Spectral F Test for Somatosensory evoked response detection
Karina Boson, Antonio Mauricio Miranda de Sá and Danilo Melges

#292
Spatial cross-correlation to determine atrial fibrillation recurrence after ablation
Raquel Cervigón, Julián Pérez-Villacastín and Javier Moreno

#96
Development of a Computer Simulator of the Visual N2 Event-Related Potential Component for the Study of Cognitive Processes
Francesca Marturano, Sabrina Brigadoi, Mattia Doro, Roberto Dell'Acqua and Giovanni Sparacino

2a REGULAR SESSION

12:15 | 13:15 Room | C1F - Dom Pedro
Chairs | Ana Mendonça, João Sanches

02: Biomedical imaging & image processing

#294
Flow Convergence Area Estimation on in vitro Color Flow Doppler Images Using Deep Learning
Grigorios-Aris Cheimariotis, Kostas Haris, Jeeso Lee, Brent White, Aggelos Katsaggelos, James Thomas and Nikolaos Maglaveras

#67
Automated Design of Efficient Supports in FDM 3D Printing of Anatomical Phantoms
Maria Agnese Pirozzi, Emilio Andreozzi, Mario Magliulo, Paolo Gargiulo, Mario Cesarelli and Bruno Alfano

#123
Diffusion Weighted Magnetic Resonance Imaging Texture Biomarkers for Breast Cancer Diagnosis
Marialena Tsarouchi, Georgios Vlachopoulos, Anna Karahaliou and Lena Costaridou

#241
Modeling Functional Processes of Brain Tissue: An fMRI Study on Patients with Un-Medicated Late-Onset Restless Leg Syndrome
Amalia K. Ntemou, Evanthia E. Tripoliti, Persefoni N. Margariti, Maria I. Argyropoulou and Dimitrios I. Fotiadis

6a REGULAR SESSION

12:15 | 13:15 Room | C1E - Inês de Castro
Chairs | Jens Muehlsteff, Rui Pedro Paiva

06: Therapeutic and diagnostic systems, devices and technologies & clinical engineering

#94
A Risk Stratification Model for Early Cognitive Impairment after Diagnosis of Parkinson's Disease
Kostas Tsiouris, Spiros Konitsiotis, Dimitrios Koutsouris and Dimitrios Fotiadis

#163
Upper Limp Movement Analysis of Patients with Neuromuscular Disorders Using Data from a Novel Rehabilitation Gaming Platform
Achilleas Chytas, Dimitris Fotopoulos, Vassilis Kilintzis, Theodoros Loizidis and Ioanna Chouvarda

#19
3D acquisition of the ear anatomy: a low-cost set up suitable for the clinical practice
Rocco Furferi, Elisa Mussi, Michaela Servi, Francesca Uccheddu, Yary Volpe and Flavio Facchini

#64
Machine Learning Classification of Females Susceptibility to Visceral Fat Associated Diseases
Mahmoud Aldraimli, Daniel Soria, Louise Thomas, Thierry Chaussalet, Jimmy Bell, James Parkinson, Brandon Whitcher and Miriam Dwek

1b REGULAR SESSION

15:00 | 16:30 Room | C2A - Mondego
Chairs | Ana Paula Rocha, Anna Bianchi

01: Biomedical signal processing

#139
Automatic segmentation of ultrasonic vocalizations in rodents
Diogo Pessoa, Lorena Petrella, Miguel Castelo-Branco and César Teixeira

#28
PCG-Decompositor: A New Method for Fetal Phonocardiogram Filtering based on Wavelet Transform Multi-Level Decomposition
Annachiara Strazza, Agnese Sbrollini, Marica Olivastrelli, Agnese Piersanti, Selene Tomassini, Ilaria Marcantoni, Micaela Morettini, Sandro Fioretti and Laura Burattini

#40
Muscular co-contraction detection: a wavelet coherence approach
Annachiara Strazza, Federica Verdini, Andrea Tigrini, Stefano Cardarelli, Alessandro Mengarelli, Sandro Fioretti and Francesco Di Nardo

#49
Calculation of breath-by-breath oxygen uptake in asthmatic patients by the "Independent breath" algorithm. Comparison with a classical approach.
Maria Pia Francescato, Miloš Ajcevic, Valentina Cettolo, Mario Canciani and Agostino Accardo

#54
Gait phase classification from surface EMGsignals using Neural Networks
Christian Morbidoni, Lorenzo Principi, Alessandro Cucchiarelli, Guido Mascia, Annachiara Strazza, Federica Verdini and Francesco Di Nardo

#76
Combining objective response detectors using genetic programming
Leonardo Felix, Quenaz Bezerra Soares, Antonio Mauricio Miranda de Sá and David Martin Simpson

2b REGULAR SESSION

15:00 | 16:30 Room | C1F - Dom Pedro
Chairs | Inez Frerichs, Timo Jaemsae

02: Biomedical imaging & image processing

#46
Shift-Compensated Volumetric Interpolation of Tomographic Sequences for Accurate 3D Reconstruction
Chiara Santarelli, Francesca Uccheddu, Fabrizio Argenti, Luciano Alparone, Monica Carfagni and Lapo Governi

#90
Calculating Texture Features from Mammograms and Evaluating their Performance in Classifying Clusters of Microcalcifications
Marcelo A Duarte, Wagner Pereira and Andre Alvarenga

#122
LNDetector: a flexible gaze characterisation collaborative platform for pulmonary nodule screening
João Pedrosa, Guilherme Aresta, João Rebelo, Eduardo Negrão, Isabel Ramos, António Cunha and Aurélio Campilho

#230
Physical breast phantom dedicated for mammography studies
Firgan Feradov, Kristina Bliznakova and Stoyko Marinov

#164
Segmentation of Pulmonary Nodules in CT Images using the Sliding Band Filter
Joana Rocha, António Cunha and Ana Maria Mendonça

#191
Method for finding the limits of blood vessel landmarks in eye fundus images based on distances in graphs: preliminary results
Martynas Patašius, Jurate Šimkiene, Daivaras Sokas and Andrius Pranskunas

6b REGULAR SESSION

15:00 | 16:30 Room | C1E - Inês de Castro
Chairs | Jens Muehlsteff, Igor Lackovic

06: Therapeutic and diagnostic systems, devices and technologies & clinical engineering

#69
A Study on Relationship between Walking Speed and Acceleration of Center of Mass Estimated with Inertial Sensors
Takashi Watanabe and Yuho Takeda

#102
Comparative assessment between 3D and conventional 2D imaging systems in laparoscopic practice
Juan A. Sánchez-Margallo, Silvia Enciso Sanz and Francisco M. Sánchez-Margallo

#171
Potentials of OCT in monitoring ocular hemodynamics of patients with primary open angle glaucoma
E.N. Iomdina, D.D. Khoziev, A.A. Kiseleva, P.V. Luzhnov, O.A. Kiseleva and D.M. Shamaev

#124
A Feasibility Test of Evaluation of Gait Movement by Using Center of Mass Estimation with Inertial Sensors
Yuho Takeda and Takashi Watanabe

#147
Controlled Thoracic Motions of an Anthropomorphic Phantom for Myocardial Perfusion Imaging
Sotiris Panagi, Antonis Antoniou, Isabelle Crysanthou-Baustert, Demetris Kaolis, Ourania Demetriadou, Costas Kyriacou and Yiannis Parpottas

#9
3D printing-based pediatric trainer for ultrasound-guided peripheral venous access
Rocco Furferi, Lorenzo Guariento, Kathleen S. McGreevy, Elisa Mussi, Niccolò Parri, Francesca Uccheddu and Yary Volpe

PS1 POSTER SESSION

15:00 | 17:00 Room | Claustros
Chairs | Mª Graça Ruano, César Teixeira

Poster Session 1

#18
Differences in Circadian Rhythms of Blood Pressure and Heart Rate Among Hypertensive and Normal Blood Pressure Subjects
Giulia Silveri, Lorenzo Pascazio, Gastone Sabbadini, Monica Guerra and Agostino Accardo

#23
Ectopic Beat Detection from Wrist Optical Signals for Sinus Rhythm and Atrial Fibrillation Subjects
Serj Haddad, Jarkko Harju, Adrian Tarniceriu, Tuomas Halkola, Jakub Parak, Ilkka Korhonen, Arvi Yli-Hankala and Antti Vehkaoja

#27
Electrocardiographic Alternans: A New Approach
Ilaria Marcantoni, Dalila Calabrese, Giorgia Chiriatti, Roberta Melchionda, Benedetta Pambianco, Giulia Rafaiani, Eleonora Scardecchia, Agnese Sbrollini, Micaela Morettini and Laura Burattini

#98
Co-activation of knee muscles in female vs. male adults
Francesco Di Nardo, Annachiara Strazza, Andrea Tigrini, Guido Mascia, Stefano Cardarelli, Alessandro Mengarelli, Federica Verdini and Sandro Fioretti

#138
Automatic segmentation of bipolar EHGs' contractions using wavelet transform
Amer Zaylaa, Ahmad Diab, Ziad Fawal, Mohamad Khalil and Catherine Marque

#174
Methods for removing of line noise artifact from EEG records with minimization of neural information loss
Jan Štrobl, Marek Piorecký, Vlastimil Koudelka, Tomáš Nagy and Vladimír Krajca

#175
Pilot Study for Estimating Physical Fatigue Based on Heart Rate Variability and Reaction Time
Ardo Allik, Kristjan Pilt, Moonika Viigimäe and Ivo Fridolin

#188
Characterization of eye gaze and pupil diameter measurements from remote and mobile eye-tracking devices
Riccardo Lolatto, Giulia Rocco, Riccardo Mustoni, Chiara Maninetti, Riccardo Pastura, Andrea Pigazzini and Riccardo Barbieri

#195
Efficacy of Time- and Frequency-Domain Heart Rate Variability Features in Stress Detection and their Relation with Coping Strategies
Pierluigi Reali, Agostino Brugnera, Angelo Compare and Anna Maria Bianchi

#197
Influence of Physical Models of Electrodes on Rat's Head Forward Modelling
David Kuratko, Jaroslav Lacik and Zbynek Raida

#135
Improvement of sleep spindle detection by aggregation techniques
Elizaveta Saifutdinova, Daniela Dudysova, Vaclav Gerla and Lenka Lhotska

#95
Preprocessing pipeline for fNIRS data in children
Caterina Piazza, Andrea Bacchetta, Alessandro Crippa, Maddalena Mauri, Silvia Grazioli, Gianluigi Reni, Maria Nobile and Anna Maria Bianchi

#99
Wavelet analysis-based Reconstruction for sEMG Signal denoising
Annachiara Strazza, Federica Verdini, Alessandro Mengarelli, Stefano Cardarelli, Andrea Tigrini, Sandro Fioretti and Francesco Di Nardo

#57
An information-theoretical method for emotion classification
Susana Brás, João Carvalho, Filipa Barros, Claúdia Figueiredo, Sandra Soares and Armando Pinho

#51
Potential Biomechanical Overload on Skeletal Muscle Structures in Students during Walk with Backpack
D'Addio Gianni, Leandro Donisi, Luca Mercogliano, Giuseppe Cesarelli, Paolo Bifulco and Mario Cesarelli

#73
Accurate Calculation of Heart Period and Pulse Wave Transit Time
Péter Nagy and Ákos Jobbágy

#165
Long-term Stability of EEG Spectral Asymmetry Index – Preliminary Study
Tuuli Uudeberg, Laura Päeske, Toomas Põld, Jaanus Lass, Hiie Hinrikus and Maie Bachmann

#152
Evaluation of System for Simultaneous Measurement of Physiological Parameters: Potential for Determination of Age-related Cardiovascular Status
Honoka Koga, Jihyoung Lee, Peter Rolfe, Ken-Ichi Yamakoshi, Akira Kamiya and Takehiro Yamakoshi

#232
Anthropomorphic physical breast phantom based on patient breast CT data: preliminary results
Sivo Daskalov, Nikiforos Okkalidis, John Boone, Stoyko Marinov, Zhivko Bliznakov, Giovanni Mettivier, Hilde Bosmans, Paolo Russo and Kristina Bliznakova

#126
Microcalcification cluster SDNR in synthesized and 2D mammography
Andreas Petropoulos, Spyros Skiadopoulos, Anna Karahaliou, Gerasimos Messaris, Georgios Vlachopoulos and Lena Costaridou

#133
Enhancing CT 3D Images by Independent Component Analysis of Projection Images
Markus Hannula, Jari A. K. Hyttinen and Jarno M. A. Tanskanen

#114
Modeling of transpalpebral tonometry system for parameters optimization of the measuring sensor
P.V. Luzhnov, E.N. Iomdina, K.V. Ivanishchev, D.M. Shamaev and A.A. Kiseleva

#186
Automatic segmentation of bone and muscle structures in CT volumes using convex relaxation and fine-tuning
Jose-Antonio Pérez-Carrasco, Carmen Serrano and Begoña Acha

#65
A Comparison of Denoising Algorithms for Effective Edge Detection in X-ray Fluoroscopy
Emilio Andreozzi, Maria Agnese Pirozzi, Antonio Sarno, Daniele Esposito, Mario Cesarelli and Paolo Bifulco

#162
Stereophotogrammetric Basic Framework for Postural Assessment
Alice Fontes and Mauricio Cagy

#184
Dermoscopic Image Segmentation: A comparison of methodologies
Paulina Andrea Vélez Núñez, María Del Carmen Serrano Gotarredona, Begoña Acha Piñero and José Antonio Pérez Carrasco

#105
Quantitative analysis of brain 18F-fluordesoxyglucose and early-phase 18F-florbetapir positron emission tomography
Alexander P. Seiffert, Adolfo Gómez-Grande, Patricia Sánchez-González, Walid Dghoughi, Alberto Villarejo-Galende, Héctor Bueno and Enrique J. Gómez

#43
Modeling and Objectification of Skiagraphy Image Quality Deterioration caused by X-ray Secondary Irradiation on Mobile X-ray Device
Klara Fiedorova, Martin Augustynek, Jan Kubicek, Marek Penhaker, Andrea Vodakova and Karol Korhelik

#33
Segmentation of Blood Vessels from Fundus Retinal Images by Using Gabor Transformation
Alice Krestanova, Jan Kubicek and Jana Kosturikova

CHALLENGE SESSION 1

15:00 | 16:30 Room | C1D - Conventual

Chairs | Aurélio Campilho, Ana Mendonça

CH1: Fraunhofer Best Portuguese PhD/MsC thesis competition in Biomedical Engineering

PhD thesis competition

#271
Microwave Breast Imaging using Dry Setup
João Felício

#284
Magnetic carbon nanostructures and study of their transport in microfluidic devices for hyperthermia
Raquel O. Rodrigues, Rui Lima, Helder T. Gomes and Adrián M.T. Silva

#285
TESSEE – Tool for Early Stem Cells Economic Evaluation
Cátia Bandeiras, Joaquim Manuel Sampaio Cabral, Stan Neil Finkelstein and Frederico Castelo Ferreira

MsC thesis competition

#281
Community Finding with Applications on Phylogenetic Networks
Luís Rita

#282
Functional Electrical Stimulation for Gait Rehabilitation
Ana Correia, Jorge Martins and Cristina Santos

#286
Deep Aesthetic Assessment of Breast Cancer Surgery Outcomes
Tiago Gonçalves, Wilson Silva and Jaime Cardoso

#287
Deep Learning for Interictal Epileptiform Discharge Detection from scalp EEG recordings
Catarina Lourenço, Marleen Tjepkema-Cloostermans, Luís Teixeira, Michel van Putten

#288
Feedback-Error Learning for Powered Assistive Devices
Pedro Nuno Fernandes, Joana Figueiredo, Juan C. Moreno and Cristina Manuela Peixoto Santos

#289
CopyRobot : interactive mirroring robotics game for ASD children
Laura Santos

#290
Neuromechanical and Environment Aware Machine Learning Tool for Human Locomotion Intent Recognition
Simão Carvalho, Joana Figueiredo and Cristina Santos

#291
Classification of Patients with Parkinson's Disease using Medical Imaging and Artificial Intelligence Algorithms
Helena Pereira and Hugo Ferreira

CHALLENGE SESSION 2

17:00 | 18:30 Room | C1D - Conventual

Chairs | Marco Simões, Jorge Henriques

CH2: IFMBE Health Informatics Scientific Challenge Competition

#272

Convolutional Neural Network for a P300 Brain-Computer Interface to improve social attention in Autistic Spectrum Disorder

Davide Borra, Silvia Fantozzi and Elisa Magosso

#273

Deep learning architecture based on the combination of convolutional and recurrent layers for ERP-based brain-computer interfaces

Eduardo Santamaría-Vázquez, Víctor Martínez-Cagigal, Javier Gomez-Pilar and Roberto Hornero

#274

Slow cortical potential BCI classification using Sparse variational Bayesian logistic regression with Automatic Relevance Determination

Aleksandar Miladinovic, Milos Ajcevic, Giulia Silveri, Gaia Ciacchi, Giulietta Morra, Joanna Jarmolowska, Piero Paolo Battaglini and Agostino Accardo

#275

A Feasible Classification Algorithm for Event-related Potential (ERP) based Brain-Computer-Interface (BCI) from IFMBE Scientific Challenge Dataset

Haifeng Zhao, Shiduo Yu, Joseph Prinable, Alistair McEwan and Petra Karlsson

#276

Linear vs nonlinear classification of social joint attention in autism using VR P300-based brain computer interfaces

Lucia de Arancibia, Patricia Sánchez-González, Enrique J. Gómez, M. Elena Hernando and Ignacio Oropesa

#277

Linear SVM algorithm optimization for an EEG-based Brain-Computer Interface used by high functioning autism spectrum disorder participants

Mayra Bittencourt-Villalpando and Natasha Maurits

#278

Classication of P300 component using a Riemannian ensemble

Dominik Krzeminski, Sebastian Michelmann, Matthias Treder and Lorena Santamaria

#279

Using time domain and Pearson's correlation to predict attention focus in Autistic Spectrum Disorder from EEG P300 components

Sophie Adama, Schindler Benjamin and Thomas Schmid

#280

Performance Evaluation of Manifold Algorithms on a P300 Paradigm based Online BCI Dataset

Bipra Chatterjee, Ramaswamy Palaniappan and Cota Navin Gupta

101 SPECIAL SESSION

17:00 | 18:45 Room | C1E - Inês de Castro
Chairs | Joana Matos Dias, Humberto Rocha

101: Optimization in medicine and biology

#266
Exact linearization techniques to analyze the population dynamics of the dengue fever vector
Helenice De Oliveira Florentino, Daniela Renata Cantane, Célia Aparecida Reis, Diego Cólon and Suelia Rodrigues Fleury Rosa

#58
Advantage of beam angle optimization in head-and-neck IMRT: patient specific analysis
Tiago Ventura, Maria Do Carmo Lopes, Humberto Rocha, Brigida da Costa Ferreira and Joana Dias

#88
Determining patient-specific dosage scheme using integer programming
Lars Hellemo and Vegard Heimly Brun

#97
Optimization of Highly Noncoplanar Arc Therapy Trajectories: a Dosimetric Approach
Humberto Rocha, Joana Dias, Tiago Ventura, Brigida Ferreira and Maria Do Carmo Lopes

#168
Dose-response to different radiochemotherapy regimens in locally advanced pancreatic cancer
Brígida Ferreira, Joana Dias, Adriana Gomes, Panayiotis Mavroidis and Humberto Rocha

#193
Comparison of different radiotherapy techniques for locally advanced pancreatic tumors
Adriana Gomes, Darlene Rodrigues and Brigida Ferreira

#47
Optimal Location of Novel Robotic Prostrate Cancer Biopsy and Brachytherapy Treatment Devices
Sina Firouzy, Dylan Jones and Ashraf Labib

105 SPECIAL SESSION

17:00 | 18:30 Room | C1F - Dom Pedro
Chairs | José Ferreira

105: Computational biology and medical applications

#293
CFD analysis for the evaluation of patient-specific hemodynamic parameters in cerebral aneurysms
Iolanda Velho, Jorge Tiago, Alberto Gambaruto, Adélia Sequeira and Ricardo Pereira

#104
Wireless Capsule Endoscope Location and a Robotic Validation Experiment
Isabel N. Figueiredo, Luis Pinto, Luis Perdigoto, Marina Oliveira, Hélder Araújo and Pedro N. Figueiredo

#130
Computational simulation of bacterial infections in surgical procedures
Pascoal Silva, José Ferreira and Paula Oliveira

#137
Aging effects on iontophoretic transdermal drug delivery
J.A. Ferreira, P. de Oliveira and L. Pinto

#179
Drug delivery enhanced by stimuli - a mathematical perspective
José Ferreira

106 SPECIAL SESSION

17:00 | 18:45 Room | C2A - Mondego
Chairs | Rute Almeida, Ana Ferreira, João Fonseca

106: Smartphone based, patient-centred technologies

#265
SmartBEAT - A smartphone-based heart failure telemonitoring solution
José Carlos Magalhães Silva Cardoso, Emilia Moreira, Inês Lopes, Carla Sousa, Sérgio Lopes Mariano Machado Leite, Manuel Campelo, José Maria Sousa, Manuela Fonseca, Linda Harnevo, Moshè Farin, Luis Filipe Azevedo and Filipe Sousa

#81
How secure is your mobile health?
Ana Ferreira, Rute Almeida and Joana Muchagata

#55
Diabetes management guidance by a logical unit supported by datamining in a mobile application
Diogo Machado, Vítor Santos Costa, Inês Dutra and Pedro Brandão

#181
Automatic quality assessment of a forced expiratory manoeuvre acquired with the tablet microphone
Rute Almeida, Bernardo Pinho, Cristina Jácome, João Fonseca Teixeira, Rita Amaral, Ivânia Gonçaives, Filipa Lopes, Ana Catarina Pinheiro, Tiago Jacinto, Cátia Paixão, Mariana Pereira, Alda Marques and João Almeida Fonseca

#210
Combined Image-based approach for monitoring the adherence to inhaled medications
Pedro Vieira-Marques, João Fonseca Teixeira, José Valente, Bernardo Pinho, Rui Guedes, Rute Almeida, Cristina Jácome, Ana Pereira, Tiago Jacinto, Rita Amaral, Ivânia Gonçalves, Ana Sá-Sousa, Mariana Couto, Mariana Pereira, Manuel Magalhães, Diana Bordalo

#177
Mobile Application to Support Children with Anxiety Disorders
Nuno Fonseca, Ana Almeida, Maria Moreno, Raquel Simões de Almeida, Luiz Faria, António Marques, Paulo Matos, Constantino Martins and Pedro Rocha

#216
Smartphone Recommendation System to Prevent Potential Injuries in Young Athletes
Paulo Matos, João Rocha, Ramiro Gonçalves, Filipe Santos, Goreti Marreiros, Daniel Mota, Nuno Fonseca and Constantino Martins

DAY 2 – Friday, September 27

			C1E - Inês de Castro	C1F - Dom Pedro	C2A - Mondego	Antiga Igreja	C1D - Conventual	Claustros
			Day 2 - Friday					
08:30	09:45	Regular Session	9	8	4		M1	
09:45	10:30	Plenary Session			PL3			
10:30	11:00	Coffee Break						CB
11:00	12:15	Special Session	118	109	113		M2	
12:15	13:00	Plenary Session			PL4			
13:00	14:15	Lunch					M3	LC
14:15	15:00	Plenary Session			PL5			
15:00	17:00	Poster Session						P2
15:00	16:30	Regular Session	110a	6c	1c		M4	P2
16:30	17:00	Coffee Break						P2
17:00	18:30	Special Session	110b	108	112		M5	
20.00	23:00	Conference Dinner				DIN		

Plenary Sessions

09:45-10:30 PL3 | Sergio Cerutti
12:15-13:00 PL4 | Slavik Tabakov
14:15-15:00 PL5 | Luis Kun

Regular Sessions

08:30-09:45
4 | Bioinformatics, computational biology and systems biology
8 | Assistive technologies
9 | Technologies for active ageing

15:00 - 16:30
1c | Biomedical signal processing
6c | Therapeutic and diagnostic systems, devices and technologies & Clinical engineering

Special Sessions

11:00-12:15
109 | Diabetes and cardiovascular diseases: Ibero-American trends
113 | Upper limb exoskeletons for a better quality of life: what is real, what is useful, and what is next?
118 | Ocular imaging

15:00-16:30
110a | Smart robotic assistant for minimally invasive surgery: the SMARTsurg project experience

17:00-18:30
110b | Smart robotic assistant for minimally invasive surgery: the SMARTsurg project experience
108 | Artificial Organs: extracorporeal blood circulation medical devices
112 | INT4DAT - Intelligent systems and technologies for diagnostic, assistance, and therapeutics

Poster Sessions

15:00 - 17:00 P1 | Poster Session 2

IFMBE Meetings

M1 | Niilo Saranummi
M2 | IFMBE meeting
M3 | Meeting the Editors
M4 | IFMBE EU-AF CoS Meeting
M5 | IFMBE Health Informatics and eHealth Working Group Meeting

Social event

20:00 - 23:00 DIN | Conference Dinner

4 REGULAR SESSION

08:30 | 09:45 Room | C2A - Mondego
Chairs | Paula Oliveira, Joel Arrais

04: Bioinformatics, computational biology and systems biology

#3
Dose–response curve: Temporal dynamics of respiratory mechanics in mice
Otavio Henrique F. Ledesma, Henrique Takachi Moriya, Renato L. Vitorasso and Maria Aparecida de Oliveira

#31
Influence of astrocytic gap junction coupling on in silico neuronal network activity
Barbara Genocchi, Kerstin Lenk and Jari Hyttinen

#32
Heart closed-loop model for the assessment of cardiac pacing
Niccolò Biasi and Alessandro Tognetti

#60
Model-Based Assessment of Sex Differences in Glucose Effectiveness and its Components
Micaela Morettini, Ludovica Ilari, Christian Göbl, Alexandra Kautzky-Willer, Andrea Tura, Giovanni Pacini and Laura Burattini

#71
Insulin Clearance in Women With a History of Gestational Diabetes Assessed by Mathematical Model Analyses of Intravenous Glucose Tolerance Test
Micaela Morettini, Christian Göbl, Alexandra Kautzky-Willer, Giovanni Pacini, Andrea Tura and Laura Burattini

8 REGULAR SESSION

08:30 | 09:45 Room | C1F - Dom Pedro
Chairs | Vicente Traver, Teresa Rocha

08: Assistive technologies

#45
Smart Shirt for Uncontrolled Movement Retraining
Peteris Eizentals, Alexei Katashev, Alexander Oks and Guna Semjonova

#134
Computational Fluid Dynamics of Blood Flow at the Left Atrium and Left Atrium Appendage
Grigoris Grigoriadis, Antonis Sakellarios, Katerina Naka, Ioanna Kosmidou, Christopher Ellis, Lampros Michalis and Dimitrios Fotiadis

#208
Powered wheelchair impact – User-centered observational study
Inês Domingues, João Pinheiro, João Silveira and Anabela Correia Martins

#39
Virtual Assistant Prototype for Managing Medication using Messaging Platforms
Surya Roca, Manuel Hernández, Jorge Sancho, José García and Álvaro Alesanco

#153
A Proposal of Measuring Telemetry System for Patient Breathing Recording within Radiotherapy
Jakub Karasek, Vladimir Kasik, Jaroslav Vondrak, Marek Penhaker, Jan Grepl, Jan Kubicek, Jakub Cvek and Lukas Knybel

9 REGULAR SESSION

08:30 | 09:45 Room | C1E - Inês de Castro
Chairs | Constantinos Pattichis, Marco Simões

09: Technologies for active ageing

#84
"Patient Station" – telerehabilitation system for people with Parkinson's disease
Marek Zylinski, Wiktor Niewiadomski, Aleksandra Waclawek, Aleksandra Budzynska, Anna Gasiorowska, Anna Stepniewska, Adam Becmer, Maciej Jagielski and Gerard Cybulski

#154
An overview of assistive robotics and technologies for elderly care
Eftychios Christoforou, Andreas Panayides, Sotiris Avgousti, Panicos Masouras and Constantinos Pattichis

#199
Artificial Intelligence Gamified AAL Solution
Marta Pinto, Mário Pereira, Diana Raposo, Marco Simões and Miguel Castelo-Branco

#50
Empowering community dwelling older citizens to improve their balance with a novel technology platform
Dimitris Gatsios, Doris Eva Bamiou, Sergi Costafreda, Eleni Georga, Konstantina Kourou, Themis Exarchos, Kostas Tsiouris and Dimitrios Fotiadis

#113
Assessment of tripping hazards by a single step evaluated by principal component analysis of pedestrian feet movements and eye behaviours
Tatsuto Suzuki, I Wa Liu, Nikolaos Papadosifos, Derrick Boampong, Pak Sum Fung and Nick Tyler

109 SPECIAL SESSION

11:00 | 12:15 Room | C1F - Dom Pedro
Chairs | Mª Graça Ruano

109: Diabetes and cardiovascular diseases: Ibero-American trends

#237
Pulse transition time method for unobtrusive blood pressure estimation
Maria Ruano, Amir Sadat Fazel, Ana Jiménez Martín, Antonio Ruano and Juan Jesús García Domínguez

#240
Improved spectral method to obtain strains of an ex-vivo membrane tissue & its performance under elevated SNRs
Ivonne Bazán, Antonio Ramos and Carlos Negreira

#239
Instrumental Proposal to Determine the State of Health of the Patients with Diabetic Foot
Ilse Anahi Torres, Lorenzo Leija, Arturo Vera, Josefina Gutierrez and Antonio Ramos

#236
A CYTED Network: New non-invasive ways for an Early Diagnosis of chronic & degenerative diseases: Diabetes & Cardiovascular
Antonio Ramos, Lorenzo Leija, Carlos Negreira, Eduardo Moreno, M.G. Ruano, Wagner Coelho, Ivonne Bazán, Fernando Merchán, César Yegros and Juan Prohias

#238
Computational strategy for the generation of the clinical histories of patients with diabetic foot
Ilse Anahi Torres, Lorenzo Leija, Arturo Vera, Josefina Gutierrez and Antonio Ramos

113 SPECIAL SESSION

11:00 | 12:15 Room | C2A - Mondego
Chairs | Alessandra Pedrocchi, Emilia Ambrosini, Marta Gandolla

113: Upper limb exoskeletons for a better quality of life: what is real, what is useful, and what is next?

#157
Research technologies for assistance during daily life activities
Marta Gandolla, Alberto Antonietti, Valeria Longatelli, Stefano Dalla Gasperina, Emilia Ambrosini and Alessandra Pedrocchi

#283
Clinical needs and possible perspectives in rehabilitation
Franco Molteni, Roberto Ballarati and Eleonora Guanziroli

#159
Upper-limb exoskeletons for stroke rehabilitation
Emilia Ambrosini, Stefano Dalla Gasperina, Marta Gandolla and Alessandra Pedrocchi

#202
Industrial Wearable Robots: a HUMANufacturing approach
Gaia Salvadore, Edoardo Rota, Giuseppe Colombina and Elena Corsi

#100
Upper limb exoskeletons for a better quality of life: what is currently available, and what is missing in the market
Marta Baratto, Caludio Ceresi and Valeria Longatelli

118 SPECIAL SESSION

11:00 | 12:15 Room | C1E - Inês de Castro
Chairs | Miguel Morgado, Rui Bernardes

118: Ocular Imaging

#178
Towards improving human corneal care using two-photon imaging
Ana Batista, Hans Georg Breunig, Berthold Seitz and Karsten König

#110
Characterization of the retinal changes of the 3xTg-AD mouse model of Alzheimer's disease
Hugo Ferreira, João Martins, Ana Nunes, Paula I. Moreira, Miguel Castelo-Branco, António Francisco Ambrósio, Pedro Serranho and Rui Bernardes

#22
Distinguishing functional from non-functional pituitary macroadenomas with a machine learning analysis
Carlo Ricciardi, Renato Cuocolo, Giuseppe Cesarelli, Lorenzo Ugga, Giovanni Improta, Domenico Solari, Valeria Romeo, Elia Guadagno, Luigi Maria Cavallo and Mario Cesarelli

#109
Sexual dimorphism of the adult human retina assessed by optical coherence tomography
Ana Nunes, Pedro Serranho, Hugo Quental, António Francisco Ambrósio, Miguel Castelo-Branco and Rui Bernardes

110a SPECIAL SESSION

15:00 | 16:30 Room | C1E - Inês de Castro
Chairs | Sanja Dogramadzi, Elana De Momi

110: Smart robotic assistant for minimally invasive surgery: the SMARTsurg project experience

#214
Towards Finger Motion Tracking and Analyses for Cardiac Surgery
Mohammad Fattahi Sani, Raimondo Ascione, Sajeeva Abeywardena, Efi Psomopoulou and Sanja Dogramadzi

#190
Surgeon Training with Haptic Devices for Computer and Robot Assisted Surgery: An Experimental Study
Salih Ertug Ovur, Marisa Cobanaj, Luca Vantadori, Elena De Momi and Giancarlo Ferrigno

#103
Augmented Reality Toolkit for a smart Robot-Assisted MIS platform
Georgios Zampokas, Konstantinos Tsiolis, Georgia Peleka, Angeliki Topalidou-Kyniazopoulou, Ioannis Mariolis, Sotiris Malasiotis and Dimitrios Tzovaras

#213
Control of a da Vinci EndoWrist surgical instrument using a novel master controller
Sajeeva Abeywardena, Efi Psomopoulou, Mohammad Fattahi Sani, Antonia Tzemanaki and Sanja Dogramadzi

#196
Toward a neural-symbolic framework for automated workflow analysis in surgery
Hirenkumar Nakawala, Elena De Momi, Roberto Bianchi, Michele Catellani, Ottavio De Cobelli, Pierre Jannin, Giancarlo Ferrigno and Paolo Fiorini

1c REGULAR SESSION

15:00 | 16:30 Room | C2A - Mondego
Chairs | Sergio Cerutti, Rui Paiva

01: Biomedical signal processing

#89
Handwriting kinematic differences between copying and dictation
Giulia Silveri and Agostino Accardo

#101
Bradycardia Assessment in Preterm Infants
Agnese Sbrollini, Martina Mancinelli, Ilaria Marcantoni, Micaela Morettini and Laura Burattini

#132
To what extent does heart rate alter the cerebral hemodynamic patterns during atrial fibrillation?
Stefania Scarsoglio, Luca Ridolfi, Andrea Saglietto and Matteo Anselmino

#156
Non-invasive intrauterine pressure estimation based on nonlinear parameters computed from the Electrohysterogram
Monica Albaladejo-Belmonte, Gema Prats-Boluda, Yiyao Ye -Lin, Carlos Benalcazar-Parra, Ángel Lopez, Alfredo Perales and Javier Garcia-Casado

#229
Linear and non-linear analysis of EEG during sleep deprivation in subjects with and without epilepsy
Silvia Marino, Giulia Silveri, Lilla Bonanno, Simona De Salvo, Emanuele Cartella, Aleksandar Miladinovic, Milos Ajcevic and Agostino Accardo

#233
Brain Oscillatory Activity and Neurological Deficit in Hyper-Acute Ischemic Stroke: Correlation of EEG Changes with NIHSS
Milos Ajcevic, Giovanni Furlanis, Lara Stragapede, Mariana Ridolfi, Paola Caruso, Marcello Naccarato, Agostino Accardo and Paolo Manganotti

6c REGULAR SESSION

15:00 | 16:30 Room | C1F - Dom Pedro
Chairs | Igor Lackovic, Simão Paredes

06: Therapeutic and diagnostic systems, devices and technologies & clinical engineering

#7
Pectus Excavatum: a new approach for monitoring cup-suction treatment
Francesco Buonamici, Antonio Marzola, Michaela Servi, Francesca Uccheddu, Yary Volpe, Marco Ghionzoli and Antonio Messineo

#108
ARTE project: EEG analysis during robotic rehabilitation
Alessandra Calcagno, Stefania Coelli, Giulia Tacchino, Marta Baratto, Franco Molteni, Eleonora Guanziroli, Cosimo Puttilli and Anna Maria Bianchi

#169
Bioimpedance, total body water and phase angle of preschool Czech children: preliminary study
Jan Hlubik, Lenka Vyslouzilová, Lenka Lhotska, Olga Stepankova and Jan Kriz

#185
TOF-watch NMB monitoring misleading display output during moderate neuromuscular blockade
Mafalda Couto, Catarina S. Nunes, Pedro Amorim and Joaquim Mendes

#211
Short-term Hemodynamic Variability in Supine and Tilted Position in Young Men
Gerard Cybulski, Edward Kozluk, Agnieszka Piatkowska, Ewa Michalak, Anna Stepniewska, Anna Gasiorowska and Wiktor Niewiadomski

#24
Backscattered Ultrasound Periodicity Characterization on Trabecular Bone-Mimicking Phantoms: a Spectral and Wavelets Approach
Christiano Bittencourt Machado, Mahmoud Meziri, Wagner Coelho de Albuquerque Pereira and Guillermo Cortela

PS2 POSTER SESSION

15:00 | 17:00 Room | Claustros
Chairs | Miguel Morgado, Nuno Neves

Poster Session 2

#85
Computational Models for Predicting Resilience Levels of Women with Breast Cancer
Konstantina Kourou, Haridimos Kondylakis, Lefteris Koumakis, Georgios C. Manikis, Kostas Marias, Manolis Tsiknakis, Panagiotis G. Simos, Evangelos Karademas and Dimitrios I. Fotiadis

#145
A systems biology approach to decipher genetic variants in a canine model of sudden cardiac death
Martina Vescio, Lia Crotti, Peter J. Schwartz and Linda Pattini

#42
Computational fluid dynamics study of inlet velocity on extrusion-based bioprinting
Juan Carlos Gómez-Blanco, Enrique Mancha, Juan Francisco Ortega-Morán, Antonio Díaz-Parralejo, Francisco Miguel Sánchez-Margallo and Jose Blas Pagador

#155
A system to assist in the training of medical students in respiratory diseases
Alejandro Talaminos-Barroso, Javier Reina-Tosina, Laura M. Roa-Romero, David Naranjo-Hernández, Gerardo Barbarov-Rostán, Pilar Cejudo-Ramos, Eduardo Márquez-Martín and Francisco Ortega-Ruiz

#160
Effects of arterial and tracheal pressures during a respiratory mechanics protocol in Spontaneously Hypertensive Rats
Otavio Henrique F. Ledesma, Henrique T. Moriya, Amanda N. Barros, Renato Vitorasso, Vitor A. Takeuchi, Felipe Fava de Lima, Raissa R. S. Amorim and Maria Aparecida de Oliveira

#125
Modeling of Carbohydrates Oxidation Rate During Exercise in Type 1 Highly-trained Diabetic Patients
Maria Pia Francescato, Milos Ajcevic, Alex Buoite Stella and Agostino Accardo

#87
The effect of perturbation time on selected spatio-temporal parameters of gait
Andrej Olenšek, Matjaž Zadravec and Zlatko Matjacic

#37

Design of a hybrid portable system for measuring the position of the spine, pelvis and center of gravity of the body

Jan Hejda, Petr Volf, Monika Bacíková, Noa Bar, Cestmír Oberman, Kristýna Rusnáková, Marcela Braunová and Patrik Kutílek

#149

THE EVALUATION OF THE JOINT QUASI-STIFFNESS DURING THE ROBOT-ASSISTED GAIT TRAINING: A PILOT STUDY

Luigi Iuppariello, Maurizio Nespoli, Fernanda Iammarone, Marianna Bertella, Ilaria Riccio, Marianna Cardillo, Angela Natalizio, Fabrizio Clemente and Mario Cesarelli

#180

Design of device for measuring the load of cross-country ski poles

Jan Hejda, Petr Volf, Jakub Mejstrík, Ján Hýbl, Aleš Tvrzník, David Gerych, Tomáš Michálek, Cestmír Oberman, Marcela Braunová and Patrik Kutilek

#215

Analysis of the effect of natural and simulated sun exposure on sunglasses lenses: a study on materials degradation

Leonardo Mariano Gomes, Mauro Masili and Liliane Ventura

#68

Efficacy of machine learning in predicting the kind of delivery by cardiotocography

Giovanni Improta, Carlo Ricciardi, Francesco Amato, Giovanni D'Addio, Mario Cesarelli and Maria Romano

#198

Device for measuring protection in sunglasses against harmful blue light

Artur D. Loureiro, Homero Schiabel and Liliane Ventura

#142

Eye Scan Ultrasound System for Automatic Cataract Detection: from a preclinical to a clinical prototype

Lorena Petrella, Marco Gomes, Fernando Perdigão, Mario Santos, Paulo Fernandes, Carlos Pinto, Sandrina Nunes, Miguel Morgado, Miguel Caixinha and Jaime Santos

#121

Investigations on a computer application for tracking the mean glandular breast dose profile in mammography

Homero Schiabel, Bruno Barufaldi and Eny Ruberti Filha

#30

Feasibility of machine learning in predicting features related to congenital nystagmus

D'Addio Gianni, Carlo Ricciardi, Giovanni Improta, Giuseppe Cesarelli, Paolo Bifulco and Mario Cesarelli

#117

A smartphone based survey to investigate the cyberisck perception on the health-care professionals

Daniele Giansanti, Lisa Monoscalco, Mauro Grigioni and Rosario Alfio Gulino

#144

Cuffless Blood Pressure Estimation Only an iPhone: Investigation on Cold Pressor Tests

Ippei Harada, Noriyuki Mochizuki, Peter Rolfe, Masahiro Shibata and Takehiro Yamakoshi

#112

Automatic Lung Reference Model

Marlene Machado, Carlos A. Ferreira, João Pedrosa, Eduardo Negrão, João Rebelo, Patrícia Leitão, André S. Carvalho, Márcio C. Rodrigues, Isabel Ramos, António Cunha and Aurélio Campilho

#83

Preliminary validation of an editable virtual reality simulator for minimally invasive surgical training

M Rodríguez, D. Camba-Lamas, I. Oropesa, K. Juhos, L. Wauben, J. Dankelman, F.W. Jansen, E.J. Gómez and P. Sánchez-González

#228

P50 and P300 event related potentials in patients with schizophrenia recorded from high density EEG

Ovidiu Banea, Elena Pegolo, Sara Marcu, Rún Friðriksdóttir, Eysteinn Ívarsson, Aron D. Jónasson, Viktor D. Jónasson, Brynja B. Magnusdóttir, Magnús Haraldsson, Eric Wassermann and Paolo Gargiulo

#10

Total Cost of Ownership as a Management Tool for Medical Devices Planning: a Case Study of a ST-Analyzer in Perinatology

Petra Hospodkova, Petr Kudrna and Vladimir Rogalewicz

#127

Cost-effectiveness analysis of selected methods of haemostatis evaluation

Martin Zavadil, Michaela Blahýnková, Miroslav Selcan and Vladimír Rogalewicz

#13

Brain Processing During Postural Control – A Study Case

Run Friðriksdóttir, Gunnar Karlsson, Halldor Svansson, Fabio Barollo, Kyle Edmunds, Antonio Fratini, Mahmoud Hassan, Hannes Petersen and Paolo Gargiulo

#20

Classifying different stages of Parkinson's Disease through Random Forests

Carlo Ricciardi, Marianna Amboni, Chiara De Santis, Gianluca Ricciardelli, Giovanni Improta, Luigi Iuppariello, Giovanni D'Addio, Paolo Barone and Mario Cesarelli

#205

Evaluation and comparison of text classifiers to develop a depression detection service

Diego Moreno-Blanco, Borja Ochoa-Ferreras, Francisco J. Gárate, Javier Solana-Sánchez, Patricia Sánchez-González and Enrique J Gomez

108 SPECIAL SESSION

17:00 | 18:30 Room | C1F - Dom Pedro
Chairs | Maria Norberto Pinho, Mónica Faria

108: Artificial organs: extracorporeal blood circulation medical devices

#212
Computational Fluid Dynamics and Experimental Analysis of Blood Gas Transport in a Hollow Fiber Module
Michael Harasek, Benjamin Lukitsch, Paul Ecker, Christoph Janeczek, Martin Elenkov and Margit Gföhler

#183
Isolation, characterization and dynamic expansion of nonparenchymal cells for the recellularization of a porcine whole liver
Sara Morini, Iris Pla-Palacín, Joaquim M. S. Cabral, Cláudia Lobato da Silva, Pedro M. Baptista, Ana Fernandes-Platzgummer

#14
Online urea concentration estimation from spent dialysate using optical sensor
Kristjan Pilt, Jürgne Arund, Annika Adoberg, Liisi Leis, Merike Luman and Ivo Fridolin

#93
Synthesis of composites of polyurethane membranes/polycaprolactone fibers for membrane blood oxygenators
Tiago Eusébio, Monica Faria, Viriato Semião and Maria Norberta de Pinho

#92
Hybrid integral asymmetric cellulose acetate/silicon dioxide ultrafiltration membranes for uremic blood purification
Monica Faria, Pedro Brogueira and Maria Norberta de Pinho

#223
Cardiopulmonary Bypass - six decades looking to the future
Pedro Lucas Fonseca, Paulo Franco, Inês Figueira, Duarte Furtado and Vanda Cláudio

110b SPECIAL SESSION

17:00 | 18:30 Room | C1E - Inês de Castro
Chairs | Sanja Dogramadzi, Elana De Momi

110: Smart robotic assistant for minimally invasive surgery: the SMARTsurg project experience

#107
Manipulation of a whole surgical tool within safe regions utilizing barrier artificial potentials
Theodora Kastritsi, Iason Sarantopoulos, Sotiris Stavridis, Dimitrios Papageorgiou and Zoe Doulgeri

#203
Evaluation of force feedback for palpation and application of active constraints on a teleoperated system
Efi Psomopoulou, Raj Persad, Anthony Koupparis, Sajeeva Abeywardena, Mohammad Fattahi Sani, Chris Melhuish and Sanja Dogramadzi

#36
A Knowledge-based Graphical Interface for Modeling Surgical Workflows in Robot-Assisted Minimally Invasive Surgery
Christos Papadopoulos, Angeliki Topalidou-Kyniazopoulou, Ioannis Mariolis, Aristotelis Sideridis, Emmanuel Papacostas and Dimitrios Tzovaras

#129
Augmented and Virtual Reality in Minimally Invasive Surgery, state of the art and future prospects
Michele Catellani, Giovanni Cordima, Ottavio de Cobelli, Efthymios Papasoulis, Emmanuel Papacostas, Aristotelis Sideridis, Georgia Peleka, Georgios Zampokas, Konstantinos Tsiolis, Angeliki Topalidou-Kyniazopoulou, Ioannis Mariolis, Sotiris Malasiotis and

112 SPECIAL SESSION

17:00 | 18:30 Room | C2A - Mondego
Chairs | Joao Ruivo Paulo, Jerome Mendes, Teresa Sousa, Eduardo Rocon, Paulo Peixoto

112: INT4DAT - Intelligent systems and technologies for diagnostic, assistance, and therapeutics

#194
Expressive Robotic Head for Human-Robot Interaction Studies
Ricardo Pereira, Luís Garrote, Tiago Barros, Carlos Carona, Luís Bento and Urbano Nunes

#242
Machine support to Discrimination of Parkinson's Disease and Essential Tremor
José Ignacio Serrano, Julián Benito-León, Aleš Holobar and Eduardo Rocon

#115
Investigating whole-brain MRI markers in Multiple Sclerosis – emerging dimensions in morphometric space
Júlia Soares, Teresa Sousa, Otília d'Almeida, Sónia Batista, Lívia Sousa, Miguel Castelo-Branco and João Valente Duarte

#140
Computational Intelligence generation of subject-specific knee and hip healthy joint angles reference curves
Pedro Cunha, João Ferreira, António Coimbra and Manuel Crisóstomo

#141
Assistive Smart Cane (ASCane) for Fall Detection: First Advances
Pedro Mouta, Nuno Ferrete Ribeiro, Rui Moreira and Cristina P. Santos

#166
Multi-View Robust Gesture Recognition for Assistive Interfaces
João Paulo, Pedro Girão and Paulo Peixoto

#189
Virtual interface for an active motorized pedal exerciser for human leg rehabilitation
J. P. Ferreira, A. Paulo Coimbra, Manuel Crisóstomo and Tao Liu

DAY 3 – Saturday, September 28

			C1E - Inês de Castro	C1F - Dom Pedro	C2A - Mondego	Antiga Igreja	C1D - Conventual	Claustros	Faculty of Law
			Day 3 - Saturday						
08:30	09:45	Regular Session	16	13	7a				M6
09:45	10:30	Plenary Session			PL6				
10:30	11:00	Coffee Break						CB	
11:00	12:15	Special Session	114	116	117				
12:15	13:00	Plenary Session			PL7				
13:00	14:15	Lunch						LC	
14:15	15:00	Plenary Session				PL8			
15:00	16:30	Regular Session	12	11	7b	5			
16:30	17:00	Coffee Break						CB	
17:00	18:30	Special Session		115	3	119			
18:00	18:30	Closing Session				Close			

Plenary Session

09:45 -10:30 PL6 | Rui Bernardes
12:15 – 13:00 PL7 | Vicente Traver
14:15 – 15:00 PL8 | Dimitrios Fotiadis

Regular Sessions

08:30 – 09:45
- 7a | Information technology in health systems
- 13 | Technologies for preventive healthcare
- 16 | Biomaterials and tissue engineering

15:00 – 16:30
- 5 | Biomechanics, robotics and rehabilitation
- 7b | Information technology in health systems
- 11 | Clinical engineering and health technology assessment
- 12 | Neuro engineering, neuro systems

17:00 – 18:00
- 3 | Bioinstrumentation, biosensor's & bio-micro/nano technologies

Special Sessions

11:00 – 12:15
- 114 | Neuro systems and connectivity
- 116 | Value-based health technology assessment
- 117 | International collaborative on medical devices assessment

17:00 – 18:00
- 115 | Therapeutic applications of imaging and neuro stimulation
- 119 | Assessing human error in cognitive/intellectual demanding tasks: case study on software engineering

IFMBE Meetings

09:30 – 13:00 M6 | IFMBE 60th Anniversary
Faculty of Law, University of Coimbra, Polo I

Closing Session

18:00 - 18:30 Close | Closing Session and Award Ceremony

7a REGULAR SESSION

08:30 | 09:45 Room | C2A - Mondego
Chairs | Nicos Maglaveras, Rui Gomes

07: Information technology in health systems

#77
Utilizing incremental learning for the prediction of disease outcomes across distributed clinical data: A framework and a case study
Vasileios Pezoulas, Themis Exarchos, Konstantina Kourou, Athanasios Tzioufas, Salvatore De Vita and Dimitrios Fotiadis

#167
EmERGE platform: a new mHealth solution for people living with HIV
Paloma Chausa, Francisco J. Gárate, Cesar Cáceres, Edward Wallitt, Jennifer Whetham and Enrique J. Gómez

#12
Machine Learning Algorithms Predict Body Mass Index using Nonlinear Trimodal Regression Analysis from Computed Tomography Scans
Marco Recenti, Carlo Ricciardi, Magnus Gìslason, Kyle Edmunds, Ugo Carraro and Paolo Gargiulo

#21
Is it possible to predict cardiac death?
Carlo Ricciardi, Valeria Cantoni, Roberta Green, Giovanni Improta and Mario Cesarelli

#44
On the privacy enhancement of in-transit health data inspection: a preliminary study
Jorge Sancho, Gert Læssøe Mikkelsen, Jonas Lindstrøm, José García and Álvaro Alesanco

13 REGULAR SESSION

08:30 | 09:45 Room | C1F - Dom Pedro
Chairs | António Dourado, Miguel Coimbra

13: Technologies for preventive healthcare

#38
Photoplethysmogram Modeling of Extreme Bradycardia and Ventricular Tachycardia
Birute Paliakaite, Andrius Petrenas, Andrius Sološenko and Vaidotas Marozas

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Diego Moreno-Blanco, Patricia Sánchez-González, Francisco J. Gárate, César Cáceres, Javier Solana-Sánchez, José M. Tormos-Muñoz and Enrique J. Gómez

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Jorge Calvillo-Arbizu, Laura M. Roa-Romero and Javier Reina-Tosina

#26
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Jose Maria Vicente-Samper, Carolina Blanco-Angulo, Ernesto Avila-Navarro and Jose Maria Sabater-Navarro

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Chairs | Ana Amaro, Mª Augusta Neto

16: Biomaterials and tissue engineering

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Joana Crisóstomo, Francisca Araújo, Pedro Granja, Cristina Barrias, Bruno Sarmento and Raquel Seiça

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Potentialities of LL37 for wound healing applications: study of its activity in synergy with biodegradable composites made of PVA and CA
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Marta A. Teixeira, M.Teresa P. Amorim and Helena P. Felgueiras

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Ján Kužma, Lukaš Horný, Tomas Suchý, Monika Šupová and Zbynek Sucharda

#78
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From static to dynamic functional connectivity: exploring the temporal changes of brain functional organization in epilepsy using simultaneous EEG-fMRI
Rodolfo Abreu

#260
Evaluation of thalamo-cortical connectivity in pediatric patients with unilateral thalamic lesions using Diffusion-Weighted MRI
Ana Rita Oliveira, Patrícia Figueiredo, Alberto Leal and Rita G. Nunes

#261
Dynamic properties of Functional Brain Networks
Joana Cabral

#119
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João Pereira, Bruno Direito, Alexandre Sayal, Carlos Ferreira and Miguel Castelo-Branco

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116: Value-based health technology assessment

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Giuditta Callea, Carlo Federici, Oriana Ciani, Fabio Amatucci, Ludovica Borsoi, Rosanna Tarricone and Marcella Marletta

#48
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Martina Andellini, Roxana di Mauro, Francesco Faggiano, Pietro Derrico and Matteo Ritrovato

#244
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Marjan Hummel

#249
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Radek Sedlacek, Tomas Suchy and Zdenek Padovec

117 SPECIAL SESSION

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Chairs | Ernesto Iadanza, Julie Polisena, Leandro Pecchia

117: International collaborative on medical devices assessment

#245
IFMBE/HTAD role in the International Collaborative on Medical Device Assessments
Ernesto Iadanza, Amy Pavlock, Julie Polisena, Rossella Di Bidino and Leandro Pecchia

#219
International Collaborative on Medical Device Assessments
Ernesto Iadanza, Amy Pavlock, Julie Polisena, Rossella Di Bidino and Leandro Pecchia

#243
ISPOR role in the International Collaborative on Medical Device Assessments
Ernesto Iadanza, Amy Pavlock, Julie Polisena, Rossella Di Bidino and Leandro Pecchia

#250
IUPEMS contribution to the International Collabora-tive on Medical Device Assessments
Leandro Pecchia

#246
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Julie Polisena and Rebecca Trowman

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Chairs | Daniele Esposito, Urbano Nunes

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#61
Experimental Study to Improve "Federica" Prosthetic Hand and its Control System
Daniele Esposito, Chiara Cosenza, Gaetano Dario Gargiulo, Emilio Andreozzi, Vincenzo Niola, Antonio Fratini, Giovanni D'Addio and Paolo Bifulco

#63
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#74
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Maria G. Signorini, Nicolò Pini, Danilo Pani and Giovanni Magenes

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Adelina Doycheva, Nikolay Dukov and Kristina Bliznakova

#209
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11: Clinical engineering and health technology assessment

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Toshiyo Tamura

#56
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Michela D'Antò, Carlo Cosentino, Arturo Cuomo, Rossana Accardo, Paolo Bifulco, Maria Romano and Leandro Donisi

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Gloria Cea, Alba Gallego, Maria Teresa Arredondo and Giuseppe Fico

#34
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Mariia Simonova, Vladimír Rogalewicz, Gleb Donin and Peter Kneppo

#128
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Ana Leitão Ferreira, Catarina S. Nunes, Joaquim G. Mendes and Pedro Amorim

#227
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#72
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Davide Borra, Silvia Fantozzi and Elisa Magosso

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Stefania Coelli, Elisa Visani, Giulia Tacchino, Ferruccio Panzica, Silvana Franceschetti and Anna Maria Bianchi

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17:00 | 18:00 Room | C2A - Mondego
Chairs | Ratko Magjarevic, Miguel Morgado

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Tomaz Jarm, Tadej Krmac, Damijan Miklavcic and Ratko Magjarevic

#176
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David Naranjo-Hernández, Javier Reina-Tosina, Laura M. Roa, Gerardo Barbarov-Rostán, Alejandro Talaminos-Barroso, Pilar Cejudo-Ramos, Eduardo Márquez-Martínn and Francisco Ortega-Ruiz

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Chairs | Miguel Castelo Branco, Rita Nunes

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João Perdiz, Aniana Cruz, Urbano J. Nunes and Gabriel Pires

#254
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#259
Effects of anodal transcranial direct current stimulation (tDCS) on cognitive performance in healthy subjects: preliminary results from the STIPED project
H. Catarina Pereira, Daniela Sousa, Marco Simões, Carlos Amaral, Rui Abreu, Joana Crisóstomo, Vânia Lopes and Miguel Castelo-Branco

#151
Non-Invasive Spinal Cord Stimulation: Relevance of Modelling Studies in Clinical Protocol Design
Sofia Rita Fernandes, Mariana Pereira, Mamede de Carvalho and Pedro Cavaleiro Miranda

119 SPECIAL SESSION

17:00 | 18:00 Room | Antiga Igreja
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119: Assessing human error in cognitive/intellectual demanding tasks: Case study on software engineering

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Armando Oliveira

#295
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Henrique Madeira

GENERAL INFORMATION

Internet (open network)

- Coimbra+
- Eventos

Registration

The Registration Desk is located on the Convento de S. Francisco.

- Thursday 08:15-13:00 - Bilheteira da Antiga Igreja
- Thursday 13:00-18:30 - Claustros
- Friday/Saturday 08:30-18:30 - Claustros

Please, register and pick up your badge and collect materials before you take any participation at the Conference.

Badges

Participants will receive a name badge upon registration. Everyone is kindly requested to wear the name badge when attending the Conference. Only participants who are wearing their name badge will be admitted to the Conference halls.

Certificates

The certificate of attendance will be available to download after the Conference. Each participant will receive an email with instructions for downloading.

Instructions for speakers (oral presentation)

Lectures must be presented in English. Preferred format for slides is 16:9 (wide screen). The presenter should deliver the presentation to the supervisor of the lecture room at least 15 minutes before the beginning of the session.

The total time allotted to each speaker is 15 minutes for regular presentations. You should plan to speak for 12 minutes and leave 3 minutes for questions and discussion. Please respect the time allotted for your presentation. Strict timekeeping will be essential to the smooth running of the Congress.

Oral presentation rooms will be equipped with a video projector and a computer that is connected to the projector. The computers will be equipped with Microsoft PowerPoint and Adobe Acrobat Reader.

Instructions for Poster presenters

Posters shall be prepared in English and must be designed to fit a freestanding poster board. Recommended format is A0 vertical (width: 841 mm, height: 1189 mm). The posters will be displayed at Room Claustros, from 15:00 to 17:00.

Posters have to be attached to the poster board by the presenting author before the poster session (15:00). Posters have to be removed from the poster board by the presenting author the same day after the poster session (17:00).

Organization will provide materials to attach the poster.

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