

The joint event of the 16th Mediterranean Conference on Medical and Biological Engineering and Computing (MEDICON) and the 5th International Conference on Medical and Biological engineering (CMBEBIH)

Sarajevo, 14. – 16., September, 2023

www.medicon2023.com, medicon2023@gmail.com

**EMBRACE
THE CHANGE!**
14. - 16. 09. 2023.

*Digital and
sustainable...*

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& CMBEBIH'23**
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CONFERENCE PROGRAM

VERSION 6

Date: **04.09.2023.**

Dear colleagues,

It is with great pleasure that we extend a warm welcome to all of you attending the joint event of the 16th Mediterranean Conference on Medical and Biological Engineering and Computing (MEDICON) and the 5th International Conference on Medical and Biological Engineering (CMBEBIH), set to take place in the beautiful city of Sarajevo from September 14th to 16th, 2023.

Over the course of these three remarkable days, you will have the opportunity to engage in thought-provoking keynote speeches delivered by esteemed experts in the field. Additionally, you will be able to attend scientific and industry sessions, actively participate in interactive panel discussions, and connect with peers from diverse backgrounds and expertise. This conference serves as a unique platform that unites researchers, scientists, engineers, professionals, and public sector representatives across various disciplines within the medical and biological engineering field.

The carefully curated program of the conference encompasses a wide range of captivating topics, emphasizing the transformative power of digitalization in healthcare and the environment. Furthermore, we are thrilled to introduce digital innovation hubs, providing a space for interactive demonstrations and fostering collaboration among attendees. Additionally, don't miss the exclusive "Meet the Editor" session, where you can engage with prominent journal editors and gain valuable insights into publishing your research.

We strongly encourage you to take full advantage of the networking opportunities offered throughout the conference. Connect with like-minded individuals, exchange ideas, and forge new collaborations that may shape the future of medical and biological engineering.

May this conference ignite your curiosity, fuel your passion for innovation, and create lasting memories. We look forward to your active participation and wish you a truly remarkable and rewarding experience.

Best regards,

Prof. dr. Lejla Gurbeta Pokvić & Prof. dr. Almir Badnjević
Conference Chairs

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GUIDELINES FOR PAPER PRESENTATION AT THE CONFERENCE

Please adhere to the following instructions for your paper presentation at the conference:

Presentation Template:

You have the freedom to select a suitable template for your presentation. Feel free to choose a template that best represents your content and enhances its visual appeal. However, ensure that the template maintains a professional look and is easy to read for the audience.

Conference Visuals:

As part of the conference branding, we have provided a set of visuals including the conference logo and relevant figures available via conference website. We encourage you to incorporate these visuals into your presentation slides to create a cohesive visual identity and align with the conference theme.

Time Limit:

Your presentation should not exceed 10 minutes in duration. Please plan your presentation accordingly to fit within this time frame. It is essential to practice and ensure that your key points are effectively conveyed within the given time constraint.

Question and Answer Session:

Following your presentation, there will be a question and answer (Q&A) session. You will have an additional 5 minutes to address any queries or comments from the audience. Prepare concise and informative responses to engage in meaningful discussions.

By following these guidelines, you will maximize the impact of your paper presentation and ensure a smooth and engaging session for the conference attendees. If you have any further questions or require additional assistance, please do not hesitate to reach out to us.

We look forward to your insightful presentation at the conference.



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We are delighted to host this conference at **Swissotel Sarajevo**, a pioneer in sustainable luxury. Sustainability isn't just a trend here – it's a moral duty. Swissotel Sarajevo leads by example, utilizing solar energy, energy-efficient lighting, and smart technology to reduce its carbon footprint.

Congress center (floor 6)

swissôtel SARAJEVO

Day 1 locations: Conference Hall & Hall BASEL

Day 2 & Day 3 locations: Hall 1, Hall 2, Hall 3 & Hall 4

Conference information desk available at the entrance of congress center. All inquiries via medicon2023@gmail.com.

For local assistance: +387 33 569 540, Verlab Institute

Wednesday, 13.09.2023.

19:00 – 23:00 Welcome Cocktail (only with invitations)

Location: Swissotel – the FUSION RESTAURANT

FOR MEDIA:

The press conference will be held on 14.09.2023. starting from 09:45 to 10:15 at Conference networking area.

Key announcements, updates, and important information will be shared with journalists and members of the press. This press conference offers an opportunity for media representatives to engage with speakers, ask questions, and gain insights into the latest developments.

Representatives of media are required to register for the conference via medicon2023@gmail.com!



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PROGRAM OVERVIEW

Date	Time	Hall	Session
14.09.2023.	09:45 - 10:15	PRESS area	PRESS Conference & MEDIA TIME
14.09.2023.	09:00 - 10:30	Conference Hall	Opening ceremony
14.09.2023.	10:45 - 12:30	Conference Hall	Healthcare Technology and Innovation
14.09.2023.	13:30 - 14:15	Conference Hall	PANEL - Perspectives on Digital Transformation in Clinical Practices through International Living Labs
14.09.2023.	14:15 - 15:00	Conference Hall	PANEL - Building Resilience: The Intersection of Digital Innovation, Green Transformation, and Preparedness in Healthcare Institutions
14.09.2023.	15:00 - 15:30	Conference Hall	Keynote lecture Mrs. Dubravka Maljević: The future of clinical engineering
14.09.2023.	15:45 - 17:00	Conference Hall	Session: Engineering and Innovations in Clinical Practice
14.09.2023.	17:15 - 19:00	Conference Hall	Session: Engineering and Innovations in Clinical Practice
14.09.2023.	10:45 - 11:45	Hall Basel	Digitizing Agriculture and Rural Development in Bosnia and Herzegovina and region: Leveraging the Power of Science
14.09.2023.	11:45 - 12:15	Hall Basel	<i>PANEL 1: Discussion on Science, Agriculture, and Rural Development in Bosnia and Herzegovina</i>
14.09.2023.	12:15 - 13:00	Hall Basel	<i>PANEL 2: Bio-Innovations in the Food System - towards next generation of multidisciplinary initiatives</i>
14.09.2023.	13:30 - 14:30	Hall Basel	CyberSecure: Navigating Policies, Data, and Beyond in Public and Private Sectors
14.09.2023.	14:30 - 15:30	Hall Basel	IFMBE Special session: WiMBE Coffee Breaks - Empowering Women in Biomedical Engineering Entrepreneurship
14.09.2023.	15:45 - 17:00	Hall Basel	Citizen-centered health platform for cross-border regions
14.09.2023.	17:15 - 19:00	Hall Basel	Industry Panel - IFMBE & BHFF
14.09.2023.	11:30 - 12:30	Networking space	Meet the DIHs session
15.09.2023.	11:30 - 12:30	Networking space	Meet the editor session
16.09.2023.	11:30 - 12:30	Networking space	Student networking Meet Up
15.09.2023.	09:00 - 10:30	Hall 1	BIOMEDICAL SIGNAL PROCESSING



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15.09.2023. 09:00 - 10:30 Hall 2	MEDICAL PHYSICS, BIOMEDICAL IMAGING AND RADIATION PROTECTION
15.09.2023. 09:00 - 10:30 Hall 3	PHARMACEUTICAL ENGINEERING
15.09.2023. 09:00 - 10:30 Hall 4	ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING IN HEALTHCARE

15.09.2023. 10:45 - 12:30 Hall 1	BIOMEDICAL SIGNAL PROCESSING
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15.09.2023. 14:00 - 15:30 Hall 1	BIOMEDICAL SIGNAL PROCESSING
15.09.2023. 14:00 - 15:30 Meeting Room 1	BIO - INNOVATIONS IN THE FOOD SYSTEM & GREEN CHEMISTRY
15.09.2023. 14:00 - 15:30 Hall 2	MOLECULAR, CELLULAR AND TISSUE ENGINEERING
15.09.2023. 14:00 - 15:30 Meeting Room 2	BIO-MICRO/NANO TECHNOLOGIES
15.09.2023. 14:00 - 15:30 Hall 4	Frugal engineering for the design of medical devices resilient to low-resource settings: state of the art, challenges, future
15.09.2023. 14:00 - 15:30 Hall 3	Smart4All project success stories

15.09.2023. 16:00 - 18:00 Hall 1	IFMBE Special session: EDUCATION IN BIOMEDICAL ENGINEERING: FOR PROFESSIONALS & FOR STUDENTS
15.09.2023. 16:00 - 18:00 Hall 2	S14. BIOMEDICAL SIGNAL PROCESSING – IFMBE YOUNG INVESTIGATOR COMPETITION
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15.09.2023. 16:00 - 18:00 Hall 3	IFMBE - CED: Trends and Opportunities in Clinical Engineering in Mediterranean Europe

16.09.2023. 09:00 - 10:30 Hall 1	BIOMEDICAL SIGNAL PROCESSING
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16.09.2023. 09:00 - 10:30 Hall 3	GENETIC ENGINEERING/ NEURAL AND REHABILITATION ENGINEERING & VETERINARY ENGINEERING



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16.09.2023. 12:45 - 14:00	Hall 1	BIOMECHANICS, ROBOTICS AND MINIMALLY INVASIVE SURGERY
16.09.2023. 12:45 - 14:00	Hall 2	. MEDICAL PHYSICS, BIOMEDICAL IMAGING AND RADIATION PROTECTION
16.09.2023. 12:45 - 14:00	Hall 3	ARTIFICIAL INTELLIGENCE IN HEALTHCARE & BIOINFORMATICS AND COMPUTATIONAL BIOLOGY
16.09.2023. 12:45 - 14:00	Hall 4	BIOINFORMATICS AND COMPUTATIONAL BIOLOGY
16.09.2023. 09:00 - 12:00	Meeting Room 1	IFMBE Officer Meeting
16.09.2023. 12:15 - 13:30	Meeting Room 1	EAMBES Councilor Meeting
16.09.2023. 12:45 - 14:00	Meeting Room 2	DMBIUBIH Assembly



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Thursday, 14.09.2023.

08:00 - 09:00 Welcome and Networking: Guest Arrival (CONGRESS CENTER)

Registration of participants will be available at the conference info desk located at the entrance of the Congress Center at Swissotel Sarajevo.

Opportunity to meet exhibitors and explore new digitalization services in Bosnia and Herzegovina - Business Networking / Photo Opportunity

09:00 - 10:30 Digital Horizons for Health and Environment: Embracing Innovation (CONFERENCE HALL)

Welcome Address by:

1. **Dr. Denis Bećirević, Member of the Presidency of Bosnia and Herzegovina**
2. **Mr. Nermin Nikšić, Prime minister, Federation of Bosnia and Herzegovina**
3. **Mr. Edin Forto, Minister – Ministry of Transport and Communications**
4. **Mr. Stefano Ellero, Head of Cooperation of the EU Delegation in Bosnia and Herzegovina**
5. **Eva Naher, Program Director at GIZ**
6. **Prof. dr. Kang-pin Lin, IFMBE Vice president**
7. **Prof. dr. Shankar Krishnan, IUPESM Vice-President**
8. **Prof. dr. Eleni Kaldoudi, EAMBES president elect**
9. **Prof. dr. Lejla Gurbeta Pokvić, Director of Verlab Research Institute**

Keynote speech:

1. **EIT Health – Zsolt Bubori**

Coffee Break

10:30 – 10:45 Coffee break

TRACK: Healthcare Technology and Innovation

10:45 - 12:30 Healthcare Technology and Innovation (CONFERENCE HALL)

Session Chair: Prof. dr. Giuseppe Fico, Polytechnic University of Madrid.

Sponsor presentation - Kenan Kekić, MedIT, Sarajevo, Bosnia and Herzegovina: Government e-Health Platform



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- **Mr. Admir Kulin**, MDOC, Germany
- **Dr. Yiota Foka**, CERN & SEEHIST Project
- **Prof. dr. Giuseppe Fico**, Polytechnic University of Madrid: Key Enabling Technologies and Digital Transformation for the Healthcare Services of the Future

11:30 – 12:30 Meet the DIHs and eDIH - Networking event (Conference B2B Space)

- **Georgios Drosato**, Athena Research Center, Greece, **SmartHealth eDIH**
<https://smarthealth-edih.eu/en/homepag/>
- **Prof. dr. Lejla Gurbeta Pokvić**, Verlab Institute & DIH Its4Health, Bosnia and Herzegovina
- **Zsolt Bubori**, European Institute for Innovation and Technology – EIT Health

12:00 – 13:30 Lunch

Location: Caffee Swiss, 2nd Floor

13:30 - 14:15 PANEL - Perspectives on Digital Transformation in Clinical Practices through International Living Labs (CONFERENCE HALL)

Session Chair: Beatriz Merino, Politechnic University of Madrid

- **Irene Mallo**, Politechnic University of Madrid
- **Kinda Kalaf**, University of Khalifa
- **Beatriz Merino**, Politechnic University of Madrid
- **Eleni Kaldoudi**, EAMBES president

Digital transformation in healthcare and clinical practice promises a paradigm shift towards data-driven, patient-centric, and precision medicine. Enabling such transformation necessitates continuous and systematic evaluation of needs, system requirements, and health technology assessment. It is crucial to adopt international standards to ensure replicability and scalability of results. **Living labs provide an ideal environment for implementing these goals and validating outcomes.** In this session, we will present perspectives from international associations and organizations in strategic sectors such as pharmaceuticals, medtech, health information systems, and assistive technologies. We will discuss key drivers, strengths, challenges, and future directions in these domains.

14:15 - 15:00 PANEL – Building Resilience: The Intersection of Digital Innovation, Green Transformation, and Preparedness in Healthcare Institutions (CONFERENCE HALL)

- **Mr. Tomislav Sokol**, European Parliament
- **Prof. dr. Lejla Gurbeta Pokvić**, its4Health DIH
- **Mr. Admir Kulin**, MDOC Germany



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- **Prof. dr. Georgios Drosato**, Athena Research Center, Greece, **Smart Health Innovation Hub eDIH**

Digital and green transformation of healthcare institutions is crucial for a sustainable and efficient healthcare system. It improves patient care, reduces costs, and promotes environmental sustainability. Implementing digital and green healthcare solutions faces challenges in Bosnia and Herzegovina due to limited resources and expertise. However, the potential benefits are significant, making it a vital area for development. Collaboration among the government, private sector, and stakeholders is essential for successful implementation. The session will gather key stakeholders to discuss challenges, share best practices, and explore the role of technology in creating a safer and sustainable healthcare system. Together, we'll explore opportunities, tackle challenges, and accelerate the adoption of digital and green solutions for a resilient and prepared healthcare future.

15:00 - 15:30 Mrs. Dubravka Maljević: The future of clinical engineering (CONFERENCE HALL)

Coffee Break

15:45 - 17:00 Engineering and Innovations in Clinical Practice (CONFERENCE HALL)

- **Prof. dr. Damijan Miklavčič**, Faculty of Electrical Engineering, University of Ljubljana: Electroporation as a new cardiac ablation technique
- **Prof. dr. Gastone Ciuti**, Institute for Biorobotics, Scuola Superiore Sant'Anna, Pisa: Frontiers of robotic endoscopy: milestones and challenges

Break

17:15 - 19:00 Engineering and Innovations in Clinical Practice (CONFERENCE HALL)

- **Prof. dr. Thomas Penzel**, Charite University Hospital, Germany: Sleep medicine – challenges for biomedical engineering
- **Prof. dr. Francesca Santoro**, RWTH Aachen University, Germany: Electronic body- Machine Interfaces - how bioelectronics can be used to cure skin and brain diseases
- **Prof. dr. Joanna Collingwood**, School of Engineering, University of Warwick: Measuring metal elements in the brain: unexpected discoveries using synchrotron x-rays



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***13:30 – 16:30 Meeting of IFMBE Division of Health Informatics and Digital Health (DHD)
(Only for IFMBE HDH members) (Meeting Room 1)***



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TRACK: Innovation and Sustainability: Advancing Agriculture, Technology, and Healthcare

10:45 - 11:45 Digitizing Agriculture and Rural Development in Bosnia and Herzegovina and region: Leveraging the Power of Science (HALL BASEL)

Keynote addressing:

- *Dr. Oskar Marko, Biosens Institute, Republic of Serbia*
- *Prof. dr. Aleksandra Nikolić, University of Sarajevo, Bosnia and Herzegovina*

11:45 - 12:15 PANEL 1: Discussion on Science, Agriculture, and Rural Development in Bosnia and Herzegovina

MODERATOR: Prof. dr. Aleksandra Nikolić, University of Sarajevo, Bosnia and Herzegovina

- *Mr. Oskar Marko, Biosens Institute Republic of Serbia*
- *Mr. Kenan Kanlić, Mlin Ustikolina (Eu4Agri Success Story)*
- *Prof. dr. Aleksandra Martinović, Director of FoodHub, Faculty of Food Technology, Food Safety and Ecology at University of Donja Gorica*

12:15 - 13:00 PANEL 2: Bio-Innovations in the Food System - towards next generation of multidisciplinary initiatives

MODERATOR: Prof. dr. Aleksandra Martinović, Director of FoodHub, Faculty of Food Technology, Food Safety and Ecology at University of Donja Gorica

- *Prof. dr. Milica Vukotić, Faculty for Information Systems and Technologies at University of Donja Gorica*
- *Ivana Vojinović, University of Donja Gorica*
- *Azra Habibija Ražanica, Head of Sales and Marketing, Swissotel Sarajevo*
- *Haris Muratović, Porsche BiH – Moon brand manager*

*Paper: Aleksandra Martinovic, Andrea Milacic, Nadja Raicevic, Amil Orahovac, Beatriz Daza, Marija Vugdelic, Adriana Cabal, Werner Ruppitsch, **Antimicrobial resistance in the food chain - are we at the point where there is no time to wait?***

12:00 – 13:30 Lunch

Location: Caffee Swiss, 2nd Floor



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13:30 - 14:30 CyberSecure: Navigating Policies, Data, and Beyond in Public and Private Sectors (HALL BASEL)

MODERATOR: Predrag Puharić - CEO - Cyber Security Excellence Centre CSEC & Faculty for Criminal Justice, Criminology and Security Studies, University of Sarajevo

- **Mr. Admir Kulić**, CloudIT
- **Predrag Puharić - CEO - Cyber Security Excellence Centre CSEC & Faculty for Criminal Justice, Criminology and Security Studies, University of Sarajevo**
- **Senad Džananović**, Senior Manager at PwC Bosnia and Hercegovina

14:30 - 15:30 IFMBE Special session: WiMBE Coffee Breaks - Empowering Women in Biomedical Engineering Entrepreneurship (HALL BASEL)

- **Prof. dr. Virginia Ballarin**, AC Member IFMBE
- **Prof. dr. Eleni Kalkoudi**, President Elect, European Alliance for Medical and Biological Engineering and Science - EAMBES
- **Prof. dr. Fabiola Martinez**, IFMBE Clinical Engineering Division Chair
- **Mrs. Manuela Apendido**, WEWoman Engineers Italy

Coffee Break

15:45 - 17:00 Citizen-centered health platform for cross-border regions (HALL BASEL)

Session Chair: Dr. Mostafa Haghi, Ubiquitous Computing Laboratory at HTWG Konstanz - University of Applied Sciences

Speakers:

- **Octavian Andronic, Busnatu Ștefan, Stănescu Ana Maria Alexandra, Carol Davila**, University of Medicine and Pharmacy Bucharest (Romania): **“From Adoption to Optimization: An Evaluation of Telemedicine’s Role and Challenges in Romania”**
- **Ms. Adna Softić**, Verlab Institute, Bosnia and Herzegovina, **“AI evidence – based management of maintenance of medical devices”**
- **Hima Zafar**, University of Novi Sad - Faculty of Technical Sciences, Novi Sad (Serbia): **“Current Scenarios in Serbia: Stretchable Textile Electronics for Noninvasive Glucose”**

Break

17:15 - 19:00 Industry Panel - IFMBE & BHFF (HALL BASEL)



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19:00 – 00:00 Digital future of SMEs in Bosnia and Herzegovina: Connection, Transformation and Innovation

This event brings together officials and representatives from the government sector in Bosnia and Herzegovina, business representatives interested in digitalization, as well as representatives from the scientific research sector in Bosnia and Herzegovina. The aim of this event is to enable participants to establish valuable business contacts, exchange ideas and experiences, and develop collaborations in the field of digitalization. With an informal setting and an appropriate program, participants will have the opportunity to meet key players in the field of digitalization, present their ideas, projects, or products, and expand their network of business contacts. Additionally, through short presentations and discussions, insights into the latest trends and best practices in digital transformation will be provided.

The event is organized with the support of project Innovation and Digitalisation in SMEs in BiH, Commissioned by the German Federal Ministry for Economic Cooperation and Development, co-funded by the EU, and part of the EU4DigitalSME Initiative of the European Union.

DIGITALIZACIJA

Restaurant 4Seasons Sarajevo

INOVATIVNA PRILIKA ZA VAŠ POSAO !

Closed event. Only with invitations.

Keynote addressing:

- 1. Zlatko Mijatović, Ministry of Economy, Canton of Sarajevo**
- 2. Steffano Ellero, Head of Cooperation of the EU Delegation in Bosnia and Herzegovina**
- 3. Eva Naher, Program Director at GIZ**
- 4. Jasmin Ademović, City of Sarajevo**



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Friday, 15.09.2023.

09:00 - 10:30 S1. BIOMEDICAL SIGNAL PROCESSING (Hall 1),

Session Chair: Prof. dr. Dušanka Bošković, Faculty of Electrical Engineering, University of Sarajevo; **Session Co-Chair:** Nerma Džaferović, International Burch University

S1.1. Magdalena Krbot Skorić, Ivan Adamec, Ivan Moštak, Nika Višnjić, Mario Cifrek, Mario Habek, Semi-automated calculation of baroreflex sensitivity (BRS) indices

S1.2. Gianluca Rho, Francesco Di Rienzo, Carlotta Marinai, Francesca Giannetti, Lucia Arcarisi, Pasquale Bufano, Michele Zanoletti, Francesca Righetti, Carlo Vallati, Marco Laurino, Nicola Carbonaro, Alessandro Tognetti, Alberto Greco, Preliminary assessment of the Samsung Galaxy Watch 5 accuracy for the monitoring of heart rate and heart rate variability parameters

S1.3. Filip Cerny, Vaclava Piorecka, Jan Strobl, Daniela Dudysova, Jana Koprivova, Marek Piorecky, EEG microstate clustering to evaluate acoustic stimulation phase-locked targeting of slow wave sleep activity

S1.4. Katerina Iskra, Miloš Ajčević, Aleksandar Miladinović, Laura Munaretto, Jacopo Giulio Rizzi, Marco Merlo, Accardo Agostino, Development of an interpretable model for improving differential diagnosis in subjects with a Left Ventricular Ejection Fraction ranging from 40 to 55%

S1.5. Isidora Rubežić, Miroslav Radunović, Dejan Babić, Tomo Popović, Nataša Popović, Fractal Characteristics of Retinal Microvascular Network in Alzheimer's Disease and Colon Cancer in Automatically Segmented Fundus Images from the UK Biobank Database

S1.6. Elena Bondi, Viviana Pescuma, Yara Massalha, Marta Pizzolante, Alice Chirico, Giandomenico Schiena, Anna Maria Bianchi, Paolo Brambilla, and Eleonora Maggioni, A TMS-EEG pre-processing parameters tuning study

09:00 - 10:30 S2. MEDICAL PHYSICS, BIOMEDICAL IMAGING AND RADIATION PROTECTION (Hall 2)

Session Chair: Prof. dr. Leandro Bocchi, University of Florence; **Session Co-Chair:** Elma Huseljić, Faculty of Natural Sciences, University of Sarajevo



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S2.1. Elma Huseljić, Senad Odžak, Adnan Beganović, Almasa Odžak, Adi Pandžić, Merim Jusufbegović, Design, manufacturing and quality assessment of 3D-printed anthropomorphic breast phantom for mammography

S2.2. Elena Denisova, Leonardo Manetti, Leonardo Bocchi, Ernesto Iadanza, Voxelization: Multi-target Optimization for Biomedical Volume Rendering

S2.3. Belkisa Hanić, Lejla M. Čiva, Mustafa Busuladžić, Azra Gazibegović-Busuladžić, Amra Skopljak-Beganović, Adnan Beganović, Importance of patient dose evaluation and optimization in thorax computed tomography

S2.4. Santiago Laguna-Castro, Teemu Tolonen, Brian Mphande, Jari Hyttinen, Antti Kaipia, A novel X-ray 3D histological method for paraffinated prostate samples

S2.5. Diletta Pennati, Leonardo Manetti, Ernesto Iadanza, Leonardo Bocchi, Image Registration Techniques for Independent Acquisitions of Cone Beam Computed Tomography Volumes

S2.6. Eleonora Tiribilli, Leonardo Manetti, Leonardo Bocchi, Ernesto Iadanza, Extremity bones segmentation in cone beam computed tomography, a novel approach

09:00 - 10:30 S3. PHARMACEUTICAL ENGINEERING (Hall 3)

Session Chair: Prof. dr. Tamer Bego, University of Sarajevo, Faculty of Pharmacy; Session Co-Chair: Emina Mrđanović, Verlab Research Institute

S3.1. Elma Hasković, Azra Dolićanin, Edhem Hasković, Safija Herenda, Orhan Lepara, The effect of the angiotensin-converting enzyme inhibitor perindopril on the lipid status of Rattus norvegicus (Berkenhout 1769)

S3.2. Amila Ahmetašević-Demirović, Dina Lagumdžija, Belma Pehlivanović Kelle, Application of isotretinoin in the treatment of acne vulgaris: a questionnaire-based survey

S3.3. Belma Pehlivanović Kelle, Lejla Kurtalić, Aida Šapčanin, Fahir Bečić, Role and application of curcumin in conventional cancer therapy

S3.4. Lamija Hindija, Ognjenka Rahić, Edina Vranić, Jasmina Hadžiabdić, Amina Tucak-Smajić, Merima Šahinović, Inclusion complexation with randomly methylated β - cyclodextrin – an opportunity to achieve greater solubility of dimenhydrinate

S3.5. Emina Mrđanović, Lejla Osmanbegović, Merima Smajhodžić-Deljo, Adna Softić, Naida Babić-Jordamović, Haris Vranić, Cost-Effectiveness of disinfectant and antimicrobial products usage in public transport



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S3.6. Hena Brkić, Emina Sarajlić, Alisa Elezović, Curl cream development – a pilot study

09:00 - 10:30 S4. ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING IN HEALTHCARE (Hall 4)

Session Chair: Prof. dr. Davide Piaggio, University of Warwick, United Kingdom; Session Co-Chair: Madzida Hundur, Verlab Institute

S4.1. Lisa Anita De Santi, Filippo Bargagna, Maria Filomena Santarelli, Giuseppe Vergaro, Dario Genovesi, Michele Emdin, Assuero Giorgetti, Vincenzo Positano, Explainable CNN-based Cardiac Amyloidosis Classification from PET Images through Manifold Learning

S4.2. Abdullah Bjelak, Sara Deumić, Jasmin Kevrić, Monia Avdić, Evaluation of bacterial biofilm category change due to the use of different signalling molecules using random forest classifier

S4.3. Francesco Di Nardo, Christian Morbidoni, Filippo Ventura, Alessandro Cucchiarelli, Sandro Fioretti, Evaluating bilateral surface EMG features for automatic identification of gait phase transitions in ground walking conditions

S4.4. Riccardo Asnaghi, Nicolo Pini, Nimrod Goldshtrom, Manuela Ferrario, A vital signs-driven approach for clustering the responses to diuretics treatment in premature newborns

S4.5. Carolina Ruiz Laguado, Martha Lucia Zequera Diaz, Francisco Carlos Calderón Bocanegra, Identification of atypical cardiac patterns before and after exercising using artificial intelligence and Eulerian video magnification

S4.6. Zhuldyz-Zhan Sagimbayev, Alisher Iglymov, Almagul Zhussupova, Meruyert Saifullakzy, Doszhan Zhussupov, Dias Tashev, Gulden Zhanmukanbetova, Raushan Myrzashova, Deep Learning Enabled Acute Ischemic Stroke Lesion Segmentation for Smart Healthcare Systems

Coffee Break

10:45 - 12:30 S5. BIOMEDICAL SIGNAL PROCESSING (Hall 1)

Session Chair: Martha Zequera, Pontificia Universidad Javeriana, Bogotá, Colombia; Session Co-Chair: Amina Tihak, Faculty of Electrical Engineering, University of Sarajevo



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S5.1. Amina Tihak, Amna Grahic, Dusanka Boskovic, Feature Selection for Arrhythmia Classification using Statistical Tests

S5.2. Federica Gioia, Mimma Nardelli, Enzo Pasquale Scilingo, Alberto Greco, Investigating the physiology behind nose thermal response to stress: a cross-mapping approach

S5.3. Andrea Gargano, Enzo Pasquale Scilingo, Mimma Nardelli, Comparing Valence-Arousal and Positive-Negative Affect Models of Affect: a Nonlinear Analysis of Continuously Annotated Emotion Ratings

S5.4. Aikaterini Archavli, Randeva Harpal, Natasha Khovanova, Postprandial Peak Identification from Continuous Glucose Monitoring Time Series

S5.5. Rita Laureanti, Simone Mentasti, Alessandro Gabrielli, Matteo Matteucci, Luca Mainardi, Emotional state evaluation in driving simulations: PC vs virtual theater

S5.6. Anna Corti, Luca Mainardi, Valentina Corino, Assessing the performance of MRI-radiomic prognostic signatures in head and neck cancer patients: a comparative analysis

S5.7. Yeison Luna, Martha Zequera, Multimodal registration algorithm of plantar pressure images and digital scanner for the characterization of the diabetic foot in the BASPI/FootLab laboratory

10:45 - 12:30 S6. HEALTH INFORMATICS, E-HEALTH AND TELEMEDICINE (Hall 2)

Session Chair: Eleni Kaldioudi, Democritus University of Thrace, Greece; **Session Co-Chair:** Wanzi Su, University of Warwick

S6.1. Martina Andellini, Massimiliano Angelini, Matteo Ritrovato, Riccardo Schiaffini, Ernesto Iadanza, Leandro Pecchia, Cost-effectiveness of Continuous Glucose Monitoring For Paediatric Patients With Type 1 Diabetes Compared With Self-Monitoring Of Blood Glucose

S6.2. Sejal S Shah, Nilesh Rathi, Nankar Meenakshi Y, Vini Mehta, Prevalence of electronic gadgets usage and its impact on sleep patterns amongst 7–10-year-old children during covid-19 pandemic: A cross-sectional observational study

S6.3. Wanzi Su, Davide Piaggio, Damon Hoad, Leandro Pecchia, A personalized toolbox for ophthalmological and neurological research: a pilot study on long covid and neurodegeneration

S6.4. Michela Franzo, Franco Marinozzi, Simona Pascucci, Fabiano Bini, Challenges and outlook to designing cutting-edge mixed reality technologies of human pose estimation

S6.5. Naida Omerović, Anela Hadžifejzović Trnka, Nermina Žiga Smajić, Selma Škrbo, Potentially inappropriate medications in geriatric patients with type 2 diabetes mellitus: practical software solution for healthcare professionals

S6.6. Pedro A. Moreno-Sánchez, Konstantinos Banitsas, Mark van Gils, Maysam Abbod, Addressing Rapidly Aging Society Challenges Through Health 4.0

10:45 - 12:30 S7. PHARMACEUTICAL ENGINEERING (Hall 3)

Session Chair: Šaćira Mandal, University of Sarajevo, Faculty of Pharmacy; Session Co-Chair: Elma Hasković, University of Sarajevo, Faculty of Pharmacy.

S7.1. Minela Dacić, Alija Uzunović, Larisa Alagić-Džambić, Saša Pilipović, HPLC-UV determination and comparison of extracted corticosteroids content with two methods

S7.2. Merima Šahinović, Amina Tucak-Smajić, Kenan Muhamedagić, Lamija Hindija, Ognjenka Rahić, Jasmina Hadžiabdić, Edina Vranić, Ahmet Čekić, Can microneedles revolutionize ocular drug delivery?

S7.3. Alija Uzunović, Emira Mlivo, Minela Dacić, Hurija Džudžević Čančar, Mineta Šupuk, Saša Pilipović, In vitro efficiency of protective masks

S7.4. Elma Hasković, Lejda Uzunović, Tanja Dujić, Aziz Šukalo, Meliha Mehić, Maja Malenica, Tamer Bego, Neven Meseldžić, Selma Imamović Kadrić, Una Glamočlija, Analysis of lysozyme as biomarker in saliva

S7.5. Minela Dacić, Alija Uzunović, Emira Mlivo, Characterization of the chemical substance niacinamide

S7.6. Šaćira Mandal, Association between serum free fatty acids and total bilirubin concentrations in Bosnian individuals with diabetes mellitus Type 2

S7.7. Karent Eliana Muñoz Salazar, Reuse of medical devices with responsibility for patient safety at a high-complex clinic in Cali, Colombia

S7.8. Mirsada Salihović, Mirha Pazalja, Ajla Špago, Elma Veljović, Selma Špirtović-Halilović, The total phenols and total flavonoids content of petioles sweet cherry (Prunus avium L.)



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10:45 - 12:30 ARTIFICIAL INTELLIGENCE APPLIED TO HEALTH TECHNOLOGY ASSESSMENT AND HEALTH TECHNOLOGY MANAGEMENT FOR EMPOWERING HEALTHCARE (Hall 4)

Conference Chair: Beatriz Merino, Polytechnic University of Madrid

- **Davide Piaggio**, University of Warwick, England: “Evaluation of AI in healthcare: the Gatekeeper project and ex ante impact assessment
- **Ernesto Iadanza**, University of Siena, Italy – Chair of the council of societies of the IFMBE: Real-World Data and Real-World Evidence in Healthcare
- **Laura López Pérez**, Polytechnic University of Madrid, Clinical Natural Language Processing and health interoperability to support knowledge management and governance in Rare Cancers
- **Alessio Luschi**, University of Florence, Italy Natural Language Processing and Explainable AI for adverse event identification of Health Information Technologies
- **Alessia Maccaro**, University of Warwick, England Ethical dilemmas of Artificial Intelligence and Generative Pre- Trained Transformers technologies in supporting decision making in healthcare
- **Martina Andellini** University of Warwick, England Cost-effectiveness of continuous glucose monitoring for paediatric patients with Type-1 diabetes compared with self-monitoring of blood glucose

Digital transformations are revolutionizing the automation and monitoring of services and processes, significantly impacting the management of care, administration, and logistics in hospitals and public health. The availability of vast and diverse sources of information has further contributed to this change. Leveraging techniques such as Natural Language Processing, semantic-web, and Explainable Artificial Intelligence enables the mining and processing of real-world data for effective health technology management, knowledge sharing, and health interoperability. However, when dealing with AI-based medical devices, assessing the concepts of safety, effectiveness, and cost-effectiveness poses additional challenges compared to traditional devices. Existing regulations, recommendations, and guidelines, particularly the European Regulation 2017/745, are inadequate in addressing these concerns. This becomes a critical issue as the medical device sector expands rapidly and AI becomes increasingly integrated, raising ethical considerations in healthcare applications.

11:30 – 12:30 MEET THE EDITORS (Conference B2B Space)

Chair: prof. dr. Shankar Krishnan, IUPESM Vice-President

1. Andrei Dragomir, Medical & Biological Engineering & Computing
2. Kyriacou Panicos, Biomedical Signal Processing and Control Journal, Elsevier
3. Yadin David, Journal of Clinical Engineering, GCEA
4. Eleni Kaldoudi Editor-in-Chief, Computational and Structural Biotechnology Journal – Smart Hospital Section
5. Giuseppe Fico, Associated Editor of the IEEE Journal of Biomedical and Health Informatics and Frontiers in Digital Health
6. Almir Badnjević, Technology and Healthcare Journal, IOS Press



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14:00 – 15:30 How to write a scientific paper? (Meeting Room 2)

1. prof. dr. Shankar Krishnan, IUPESM Vice-President
2. Andrei Dragomir, Medical & Biological Engineering & Computing

15:45 – 18:00 Cognitive Interview Discussions with Students and Practitioners (Meeting Room 2)

MPharma holder, Azra Soljanin, currently a PhD Candidate at the Department of Social Pharmacy, Faculty of Medicine, University of Montenegro, is engaged in a research project titled **"Assessment of pharmacy students' and practitioners' knowledge, attitudes, and practices regarding sustainable medicine management in Bosnia and Herzegovina, Montenegro, Portugal, and Serbia."**

Participation is invited for Cognitive Interview Discussions to provide comprehensive feedback on the project's questionnaire content in terms of comprehensibility, acceptability, and relevance.

Data will be securely stored and destroyed after the retention period. Contact information for further inquiries is available. Communication with the Principal Investigator, MPharma Azra Soljanin, is encouraged via azra.soljanin@hotmail.com.

12:00 – 13:30 Lunch

Location: Caffee Swiss, 2nd Floor

14:00 - 15:30 S8. BIOMEDICAL SIGNAL PROCESSING (Hall 1)

Session Chair: *Damijan Miklavčič, Faculty of Electrical Engineering, University of Ljubljana.*

Session Co-Chair: *Alessio Luschi, University of Florence, Italy*

S8.1. Marta Iovino, Ivan Lazic, Tatjana Loncar-Turukalo, Michal Javorka, Riccardo Pernice, Luca Faes, Classification of Physiological States through Machine Learning Algorithms Applied to Ultra-Short-Term Heart Rate and Pulse Rate Variability Indices on a single-feature basis

S8.2. Šimun Krmek, Mario Cifrek, Yueming Gao, Željka Lučev Vasić, Decomposition of HDsEMG signals recorded from a forearm extensor muscle based on blind source separation

S8.3. Valeria Rosalia Vergara, Chiara Bara, Riccardo Pernice, Andrea Zaccaro, Francesca Ferri, Luca Faes, Yuri Antonacci, Exploring the Predictability of EEG Signals Timed with the Heartbeat: A Model-Based Approach for the Temporal and Spatial Characterization of the Brain Dynamics

S8.4. Yuri Antonacci, Gorana Mijatovic, Laura Sparacino, Simone Valenti, Gianvincenzo Sparacia, Daniele Marinazzo, Sebastiano Stramaglia, Luca Faes, **Measuring the Balance between Synergy and Redundancy in Network Systems by using Information Theory**

S8.5. Chiara Bara, Riccardo Pernice, Laura Sparacino, Yuri Antonacci, Michal Javorka, Luca Faes, **Comparison of Linear Model-Based and Nonlinear Model-Free Directional Coupling Measures: Analysis of Cardiovascular and Cardiorespiratory Interactions at Rest and During Physiological Stress**

S8.6. Emira Mlivo, Minela Dacić, Alija Uzunović, Saša Pilipović, Kemal Durić, Azra Bašić-Halilović, **Determination of capsaicin and dihydrocapsaicin content by HPLC method in products purchased online**

14:00 - 15:30 S9. BIO - INNOVATIONS IN THE FOOD SYSTEM & GREEN CHEMISTRY (Meeting Room 1)

Session Chair: Prof. dr. Aleksandra Martinović, Director of FoodHub, Faculty of Food Technology, Food Safety and Ecology at University of Donja Gorica. Session Co-Chair: Dado Latinović, International Burch University & Bosnia and Herzegovina Futures Foundation

S9.1. Beatriz Daza-Prieto, Adriana Cabal-Rosel, Nadja Raicevic, Anna Stoeger, Johann Ladstaetter, Robert L. Mach, Werner Ruppitsch, Aleksandra Martinovic, **The many faces of E. faecium: from probiotics to pathogenesis**

S9.2. Dado Latinović, **HPLC Q-TOF LC/MS Analysis of Inulin in Foods: Development of an Innovative Chromatography Method for Nutritional Enhancement**

S9.3. Adriana Cabal, Beatriz Prieto, Nadja Raicevic, Ariane Pietzka, Ali Chakeri, Patrick Hyden, Michael Kundi, Alexander Indra, Robert Mach, Julio Enrique Parra Flores, Aleksandra Martinovic, Werner Ruppitsch, **Whole genome sequencing for food safety, clinical and public health microbiology**

S9.4. Tolic Tina, Klepo Lejla, Topcagic Anela, Copra-Janicijevic Amira, Omar Chahin, Kresic Dragan, Ostojic Jelena, **Optimization of glyphosate adsorption conditions on pyrophyllite**

S9.5. Aleksandra Babić, Nejla Pirić, Elma Imamović, **Analysis of atmospheric concentrations of PM10 and PM 2.5 and their impact on the health status of the population in urban industrial cities of Bosnia and Herzegovina**



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14:00 - 15:30 S10. MOLECULAR, CELLULAR AND TISSUE ENGINEERING (Hall 2)

Session Chair: Prof. dr. Monia Avdić, International Burch University. **Session Co-Chair:** Merima Smajlhodžić-Deljo, Verlab Research Institute

S10.1. Zurifa Ajanović, Emina Dervišević, Muhamed Katica, Lejla Dervišević, Adis Salihbegović, Amela Dervišević, Muamer Dervišević, Delila Numanagić, Nermin Sarajlić, Aida Sarač-Hadžihalilović, Analysis of morphological changes of leukocytes on peripheral blood smear of Wistar rats in hyperthermia using geometric morphometric method

S10.2. Zurifa Ajanović, Lejla Dervišević, Ilvana Hasanbegović, Amela Dervišević, Almira Lujinović, Maida Šahinović, Jasmina Biščević-Tokić, Džan Ahmed Jesenković, Emina Dervišević, Geometric morphometrics analysis of the effect of liposomal bupivacaine on nerve tissue during peripheral nerve blockades

S10.3. Nina Kocivnik, Skin substitutes: an overview of current state of the art

S10.4. Tea Bećirević, Izet Eminović, Nadira Ibrišimović Mehmedinović, Edin Omeragić, Edin Falan, Ermin Papračanin, Mirza Ibrišimović, Evaluation of platelet-enriched plasma antimicrobial effect: in vitro study

S10.5. Inna Zumberg, Larisa Chmelikova, Vratislav Cmie, The influence of popular antibiotics in culture medium on the cell motility and superoxide production of mesenchymal stem cells

S10.6. Rok Šmerc, Samo Mahnič-Kalamiza, Damijan Miklavčič, Current density modelling in anisotropic muscle tissue: how many finite elements is too many?

14:00 - 15:30 S11. BIO-MICRO/NANO TECHNOLOGIES (Meeting Room 2)

Session Chair: Joanna Collingwood, University of Warwick **Session Co-Chair:** Adna Softić, Verlab Institute

S11.1. Berrin Chatzi Memet, Eren Demirpolat, Turgay Yildirim, Omer Aydin, Development of polymer-based nanoparticles for the reduction of melittin toxicity

S11.2. Berna Oyku Ozbey, Gulizar Caliskan, Endemic Inula Viscosa (L.), Extracts and Their Potential for both Biosynthesizing Silver Nanoparticles and Antimicrobial Activity

S11.3. Helena Cindrić, Damijan Miklavčič, Bor Kos, Treatment planning for electrochemotherapy of spinal metastases



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S11.4. Adna Softić, Ivana Čeko, Zerina Kalić, Nejla Pirić, Emina Mrđanović, Elma Imamović, Review of MRI reporter genes in oncology

S11.5. Sagar Borse, Anita Sanap Tandale, Sanjyot Mulay, Vini Mehta, Karishma Krishnakumar, The effect of different final irrigant activation techniques on the bond strength of an MTA-based endodontic sealer- An in vitro study

14:00 - 15:30 S12. Frugal engineering for the design of medical devices resilient to low-resource settings: state of the art, challenges, future (Hall 4)

Session Chair: Davide Piaggio, School of engineering, University of Warwick, United Kingdom

The United Nations' 2030 Agenda for Sustainable Development emphasizes the importance of 17 Sustainable Development Goals, with a focus on leaving no one behind. Among these goals, Good Health and Wellbeing is a priority, aiming to ensure equitable access to healthcare worldwide. However, the current reality falls short of this objective, as a few high-income countries dominate the medical device market, neglecting the unique challenges faced by resource-constrained settings. To address this issue, a frugal engineering approach is crucial. Frugal engineering aims to design medical devices that are cost-effective, tailored to low-resource settings, and optimized for local contexts. This track welcomes submissions on applying frugal engineering principles to address challenges in low-resource settings, including artificial intelligence, mHealth, eHealth, additive manufacturing, and health technology management.

Speakers:

1. Dan Clarke, LIVERPOOL JOHN MOORES UNIVERSITY, United Kingdom
2. Philippa Makobore, University of Calgary
3. Alessia Maccaro, SCHOOL OF ENGINEERING OF THE UNIVERSITY OF WARWICK, United Kingdom
4. Davide Piaggio, School of engineering, University of Warwick, United Kingdom
5. Florinda Coro, RESEARCH CENTRE ENRICO PIAGGIO, Italia

S12.1. Alessia Maccaro, Davide Piaggio, Leandro Pecchia: Ethics for Biomedical Engineering: the way forward for proper emergency preparedness and governance

S12.2. Davide Piaggio, Marco Cinelli, Alessia Maccaro, Rossana Castaldo, Sara Cinelli, Leandro Pecchia, Designing medical devices (MDs) resilient to low-resource settings (LRSs): a Delphi study and multi-criteria decision analysis (MCDA) approach

S12.3. Luis Montesinos, Pedro Checa Rifá, Javier Maldonado-Romo, Davide Piaggio, Mireya Rifá Fabregat, Sustainability across the medical device lifecycle: a scoping review

S12.4. Florinda Coro, Andrea Arcangeli, Carmelo De Maria, Valentina Mangano, Arti Ahluwalia, Open-source medical device for in vitro diagnosis of malaria



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S12.5. Philippa Makobore, Appropriate Point of Care Diagnostics for Resource Constrained Settings

A12.6. Dan Clark, Frugal Engineering – The Tide That Lifts All Boats

14:00 - 15:30 Smart4All project success stories (Hall 3)

Session Chair: Katerina Lamprakopoulou, SMART4ALL Communication officer

14:05 – 14:40 Technology Transfer Experiments focused on the digitization of healthcare – Success stories by SMART4ALL partners

- FederatedMesh: Collaborative Federated Learning for Medical Data Sharing in Mesh Networks
- Mennan Selimi, Associate Professor at South East European University (SEEU)
- SYNTROFOS: A Wearable Device for Vital Sign and COVID-19 Symptoms Monitoring - Jovan Đurković, Research Engineer at MEConet
- SE HOF: Sensing Medical Things at the Edge in the Hospital of the Future, Christina (Tanya) Politi, assistant professor, Business Developer at Patras Science Park (PSP)
- RE-HUB: REMote mUlti-modal rehabilitation system – Christos Panagiotou, AVN

14:40 – 15:25 Digitization and innovation in health – Success stories from SMART4ALL funded experiments

- FUTURE MD: Capacity building for development of innovative system for prediction of Medical Device performance – Lejla Gurbeta Pokvic, Director at Verlab Institute
- NFB VR: Neurofeedback Virtual Reality - Nikola Petrović, project manager at IC METACOGNIS
- FAPSA: First Aid Parental Support Application – Bom Solutions (Name of speaker TBD)
- DP for Drivers: Digitalized Psychology for Drivers – Svetlana Borojević, project manager at the Laboratory for Experimental Psychology, University of Banja Luka
- D-Rabbit: Deep leaRning for smArt Balance Board sensorImotor Training – Paolo Meloni, Associate Professor at University of Cagliari & Bojan Blazica, Scientific Researcher at Jožef Stefan Institute and Lead developer at OLOK/PB3

Coffee Break

16:00 - 18:00 S13. IFMBE Special session: EDUCATION IN BIOMEDICAL ENGINEERING: FOR PROFESSIONALS & FOR STUDENTS (Hall 1)

16:00 - 18:00 S14. BIOMEDICAL SIGNAL PROCESSING – IFMBE YOUNG INVESTIGATOR COMPETITION (Hall 2)

Session Chair: Ratko Magjarević, International Federation on Medical and Biological Engineering. **Session Co-Chair:** Malik Mulahalilović, Verlab Institute

Keynote lecture by Prof. dr. Ratko Magjarević, International Federation on Medical and Biological Engineering, Emerging technologies in health care and rehabilitation

S21.1. Marta Carrara, Diletta Guberti, Stephan Jakob, Manuela Ferrario, Restoring the arterial tree in sepsis: a neglected therapy target

S21.2. Marta Carrara, Riccardo Campitelli, Antoine Herpain, Manuela Ferrario, A new algorithm for arterial inflection point identification in critically ill patients: a preliminary study

S21.3. Marta Carrara, Bruno Garcia, Antoine Herpain, Manuela Ferrario, Hemodynamic cardiovascular indices to predict the response to angiotensin-II in septic shock

S21.4. Francesca Lo Iacono, Gianluca Pontone, Valentina D.A. Corino, Assessing left ventricle radiomic features robustness by segmentation perturbations

S21.5. Maria Scuderi, Janja Dermol-Černe, Janez Ščančar, Stefan Marković, Lea Rems, Damijan Miklavčič, In vitro electrochemotherapy experiments to quantify the number of cisplatin molecules needed for a cytotoxic effect when different types of pulses are delivered

S21.6. Owain Cisuelo, Muhammad Salman Haleem, John Hattersley, Leandro Pecchia, Spectrogram-driven Convolutional Neural Network for Real-Time Non-invasive Hyperglycaemia Detection in Paediatric Type-1 Diabetes via Wearable Sensors

16:00 - 18:00 S15. ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING IN HEALTHCARE (Hall 4)

Session Chair: Prof. dr. Leandro Pecchia, University Biomedico di Roma, Italy. **Session Co-Chair:** Sumeja Hadžalić, Faculty of Pharmacy, University of Sarajevo

S15.1. Elena Adelucci, Martina Falagiani, Sara Lombardi, Piergiorgio Francia, Leonardo Bocchi, Sepsis Detection using Features Extracted from Photoplethysmography

S15.2. José Luis Ganoza-Quintana, José Luis Arce-Diego, Félix Fanjul-Vélez, Digital Histopathological Discrimination of Label-Free Healthy Tissues by Decision Tree Classifier



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S15.3. Lemana Spahić, Zerina Mašetić, Almir Badnjević, Asim Kurjak, Lejla Gurbeta Pokvić, Artificial Intelligence-Based Ultrasound Imaging Classification for Infant Neurological Impairment Disorders: A Review

S15.4. Benjamin Dobardžić, Armin Alibašić, Nela Milošević, Bojana Mališić, Milica Vukotić, Forecasting Meningitis with Machine Learning: An Advanced Classification Model Analysis

S15.5. Sumeja Hadžalić, Arnela Obralijs, Šeila Bećirović, Belma Pehlivanović Kelle, Ehlimana Krupalija, Analysis of Predictive Parameters in Prediction of the Occurrence of Type 2 Diabetes Using Machine Learning Algorithms

S15.6. Laura Lopez-Perez, Eugenio Gaeta, Itziar Alonso, Alejo Esteban, Victor Gerardo Dominguez, Franco Mercalli, Elena Martinelli, Annalisa Trama, Maria Fernanda Cabrera, Maria Teresa Arredondo, Giuseppe Fico, Clinical Natural Language Processing and health interoperability to support knowledge management and governance in Rare Cancers

S15.7. Dejan Babic, Luka Filipovic, Sandra Tinaj, Ivana Katnic, Stevan Cakic, Ten Year Cardiovascular Risk Estimation: A Machine Learning Approach

S15.8. Zoja Šćekić, Luka Filipović, Ivana Katnić, Nela Milošević, Stevan Šandi, Thyroid Hormones Parameter-Based Classification of Patient Health Status: An Analysis of Machine Learning Techniques

S15.9. Ivan Jovetic, Milica Vukotic, Sandra Tinaj, The future of (individual) security – Vision 2.0?

16:00 - 18:00 S16. ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING IN HEALTHCARE (Meeting Room 1)

Session Chair: Tomo Popović, University of Donja Gorica. Session Co-Chair: Martina Sassi, University Biomedico di Roma, Italy

S16.1. Essi Pietilä, Pedro A. Moreno-Sánchez, When an explanation is not enough: An overview of evaluation metrics of explainable AI systems in the healthcare domain

S16.2. Cansu Celebioglu, Ayca Kumluca Topalli, IoT-Based Incubator Monitoring and Machine Learning Powered Alarm Predictions

S16.3. Simão Paredes, Sónia Sousa, Jorge Henriques, Teresa Rocha, José Sousa, Lino Gonçalves, Interpretability and Personalization Aspects in the Development of Clinical Risk Assessment Models



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S16.4. Asja Muharemović, Jasmin Kevrić, Cardiovascular Health in AI: A Comprehensive Overview to Acute Myocardial Infarction Prediction

S16.5. Omer Aydin, Zakarya Al-Shaebi, Munevver Akdeniz, Gizem Kursunluoglu, Gokmen Zarasiz, Serra İlayda Yerlitas, Ahmet Sezgin, Mustafa Altay Atalay, Pinar Sagiroglu, A New and Fast Approach for Antimicrobial Resistance Detection: Combination of Artificial Intelligence and Surface-enhanced Raman Spectra

S16.6. Martina Sassi, Muhammad Salman Haleem, Leandro Pecchia, Spectrogram-based approach with Convolutional Neural Network for human activity classificatio

S16.7. Šišić Nedim, Baraković Muhamed, Almisreb Abd Ali, Granziera Cristina, Rogelj Peter , Class Probability Distributions of a Neural Network Classifier of Multiple Sclerosis Lesions on Quantitative Susceptibility Mapping

S16.8. Ivan Jovetic, Ivana Katnic, The security framework: determined and AI impact?

S16.9. Ivan Jovović, Marko Grebović, Lejla Gurbeta Pokvić, Tomo Popović, Stevan Čakić, Liver Diseases Classification Using Machine Learning Algorithms

17:00 – 18:30 IFMBE - CED: Trends and Opportunities in Clinical Engineering in Mediterranean Europe (Hall 3)

Session Chair: MEng Fabiola Martinez Licona. **Session Co-Chair:** Prof. dr. Lejla Gurbeta Pokvić, Verlab Research Institute

Clinical Engineering is a fundamental discipline in efficient and safe medical technology management in health systems. This domain constantly evolves and adapts to technological advances, changing medical care needs. As part of the activities of the Clinical Engineering Division of the International Federation of Engineering in Medicine and Biology IFMBE, the organization of discussion forums on regional relevance allows a better appreciation of the challenges and opportunities that can be promoted for the development of the profession. This session will explore emerging trends in Clinical Engineering in Mediterranean Europe, highlighting focus areas and innovations shaping professional development in this field.

- **Keynote addressing: Adriana Velazquez Berumen – Team Lead on medical devices and in vitro diagnostics – World Health Organization**
- BME MEng Fabiola Martinez Licona (organizer and moderator)
- PhD Leandro Pecchia (CED Board member – Italy) -
- PhD Kallirroï Stavrianou (CED Board member – Greece)
- PhD Lejla Gurbeta Pokvic (CED Collaborator – Bosnia and Herzegovina)



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19:00 – 00:00 Social event

All participants are welcomed!

The image consists of two parts. The top part is a vibrant event poster with a purple and blue background. It features a stylized graphic of a human hand and a robotic hand reaching towards each other. The text on the poster reads: "IT'S AN Electric CELEBRATION!" in large, bold letters, with "Electric" in a colorful, glowing font. Below this, it says "CMBEBIH & MEDICON 2023". The event details are "15.09. AT 19:30 MALA PIVNICA SARAJEVO". The main attraction is "DJ LIVE MUSIC!" flanked by double arrow symbols. At the bottom left, it states "DINNER AND WELCOMING DRINKS ARE INCLUDED!".

The bottom part is a screenshot of a Google Maps search for "mala pivnica sarajevo". The search results show "Pivnica Sarajevo" with a 4.4-star rating and 1,613 reviews. The location is identified as a restaurant on Maršala Tita 7, Sarajevo 71000. The map shows the surrounding area, including the Sava river and various landmarks like the Ministry of Civil Affairs and the City Center Apartment.

Saturday, 16.09.2023.

09:00 – 12:00 IFMBE Officer Meeting (Meeting Room 1)

12:15 – 13:30 EAMBES Council Meeting (Meeting Room 1)

09:00 - 10:30 S17. BIOMEDICAL SIGNAL PROCESSING (Hall 1)

Session Chair: Irene Malo, Polytechnic University Madrid; **Session Co-Chair:** Nerma Džaferović, International Burch University

S17.1. Alessandra Raffini, Francesco Bassi, Miloš Ajčević, Aleksandar Miladinović, Agostino Accardo, Kinematic characterization of movements during the Tinetti test

S17.2. Amina Tihak, Lejla Smajlovic, Dusanka Boskovic, Classification of Atrial Fibrillation ECG Signals using 2D CNN

S17.3. Dino Cindrić, Luka Klaić, Antonio Stanešić, Mario Cifrek, Non-Contact Biopotential Measurement System with Capacitive Driven Right Leg Circuit

S17.4. Francesco Bassi, Alessandra Raffini, Miloš Ajčević, Aleksandar Miladinović, Lisa Di Blas, Agostino Accardo, Relationship between personality and kinematic parameters of handwriting

S17.5. Raquel Cervigon, Samuel Ruiperez-Campillo, Jose Millet, Francisco Castells, Loneliness and Heart Rate in older adults

S17.6. Elma Kandić, Lejla Gurbeta Pokvić, Filters for Electrocardiogram Signal Processing: a review

09:00 - 10:30 S18. CLINICAL ENGINEERING AND HEALTH TECHNOLOGY ASSESSMENT (Hall 2)

Session Chair: Ernesto Iadanza, University of Sienna. **Session Co-Chair:** Faruk Gutić, Faculty of Medicine, University of Sarajevo

S18.1. Dario Léon Merten, Dubravka Maljevic, Markus Buchgeister, Development of a failure prediction strategy for imaging systems - A study from the clinical side of view



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S18.2. Martina Andellin, Alberto Eugenio Tozzi, Matteo Ritrovato, Melania Manco, Michael Bergman, Screening prediabetes using 1 hour glucose. A simulation model to estimate the lifetime health and economic outcomes

S18.3. Margarita Maria Sarmiento Montoya, Karent Eliana Muñoz Salazar , Implementation of a medical equipment alarm management program under joint commission international accreditation standards in a high-complexity clinic in Cali, Colombia

S18.4. Alessio Luschi, Ernesto Iadanza, OHIO - Odin Hospital Indoor cOmpass for empowering the management of hospitals

S18.5. Fabiola M. Martinez-Licon, Calculating the Required Mammography Machines for Breast Cancer Screening in Mexican States with High Incidence Rates: A Proposed Model

S18.6. Serkalem D Beyene, Jari J Viik, Evaluation of Electrocardiographic Leads Using Conventional ST-Segment Depression and ST-Segment Depression/Heart Rate Hysteresis for Diagnosing of Coronary Artery Disease in Women Population: The Finnish Cardiovascular Study

S18.7. Sandra Tinaj, Milica Vukotic, Bojana Malisic, Lidija Lukovac , Assessing the Baseline Impact of Agile Human Resource Management in the Healthcare Systems of Western Balkan Countries

09:00 - 10:30 S19. GENETIC ENGINEERING/ NEURAL AND REHABILITATION ENGINEERING & VETERINARY ENGINEERING (Hall 3)

Session Chair: Safija Herenda, Faculty of Natural Sciences, University of Sarajevo. Session Co-Chair: Emina Mrđanović, Verlab Institute

S19.1. Federico Temporiti, Alessandra Calcagno, Stefania Coelli, Giorgia Marino, Roberto Gatti, Anna Maria Bianchi, Manuela Galli, Association between variations in kinematic indexes of manual dexterity and mu rhythm desynchronization changes after action observation and motor imagery

S19.2. Alessandra Calcagno, Stefania Coelli, Federico Temporiti, Roberto Gatti, Manuela Galli, Anna Maria Bianchi Handedness-dependent brain networks re-organization during visuo-motor task execution

S19.3. Amina Radončić, Semina Hadžić, Jasmina Laković, Brain-Computer Interface Through the Prism of Modern Age

S19.4. Dženita Omerkić Dautović, Belkisa Hodžić, Selam Omerkić, Application of stem cells in dentistry

09:00 - 10:30 S20. ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING IN HEALTHCARE (Hall 4)

Session Chair: Prof. dr. Gastone Ciuti, Sant'Anna School of Advanced Studies. Session Co-Chair: Madžida Hundur, Verlab Research Institute

S20.1. Tamara Pavlović, Marko Grebović, Armin Alibašić, Milica Vukotić, Stevan Šandi, Forecasting Icterus with Machine Learning: An Advanced Classification Model Analysis

S20.2. Ivan Lazic, Niksa Jakovljevic, Milan Rapaic, Jasmina Boban, Tatjana Loncar-Turukalo, Evaluation of deep learning techniques for automatic lesion segmentation in mammography images

S20.3. Lemana Spahić, Adna Softić, Azra Durak-Nalbantić, Edin Begić, Bojan Stanetić, Haris Vranić, Integrating Machine Learning in Clinical Decision Support for Heart Failure Diagnosis: case study

S20.4. Faris Hrvat, Lemana Spahić, Amina Aleta, Heart disease prediction using logistic regression machine learning model

S20.5. Owain Cisuelo, Muhammad Salman Haleem, John Hattersley, Leandro Pecchia, Spectrogram-driven deep-learning using single-lead electrocardiogram for glycaemic event detection in people with diabetes

Coffee Break

10:45 - 12:30 S21. METROLOGY IN MEDICAL MEASUREMENTS (Hall 1)

Session Chair: Prof. dr. Lejla Gurbeta Pokvić, Verlab Institute. Session Co-Chair: Dajana Brnada, International Burch University

S14.1. Baki Karaböce, Lessons Learned from External Audits in Medical Device Testing Laboratories: Best Practices and Recommendations for Quality Management

S14.2. Vohobjon Nishonov, Lemana Spahić, Amar Deumić, Ammar Trakić, Najmiddin Muminov, Sheroz Ismatullev, Lejla Gurbeta Pokvić, Implementation of legal metrology framework for medical devices to healthcare sector in the Republic of Uzbekistan



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S14.3. Muhammed Emin MAYDA, Hayriye KORKMAZ, Baki Karaboce, Design of Electronic Drivers At Harmonic Frequency for High Intensity Focused Ultrasound Applications

S14.4. Mana Sezdi, Nazif İlker Sezdi, Performance Test and Calibration in End Tidal Carbon Dioxide Measurements

S14.5. Baki Karaböce, Metrology versus Medical Metrology

S14.6. Baki Karaböce, Hüseyin Okan Durmuş, Verification of Ultrasound Imaging Phantoms: An Evaluation Study

10:45 - 12:30 S22. CLINICAL ENGINEERING AND HEALTH TECHNOLOGY ASSESSMENT (Hall 2)

Session Chair: Dubravka Maljević, BWG Kliniken Germany. Session Co-Chair: Manuela Appendino, WE WOM Engineers

S22.1. Petra Nemcekova, Tomas Holecek, Jiri Chmelik, Petr Ourednicek, Katerina Valis, and Roman Jakubicek, Establishing the Optimal Standard for Preprocessing Head CT Data in Diagnostic Analysis

S22.2. Ernesto Iadanza, Alessio Luschi, Standardization of failure codes and nomenclature of medical devices for Evidence-Based Maintenance

S22.3. Alma Badnjević-Čengić, Amila Čerim-Aldobašić, Mubina Hodžić, Davorka Dautbegović Stevanović, Advanced diabetes technology for better glucoregulation, opportunities and cost benefit („review on the reality of a developing country”)

S22.4. Manuela Appendino, Maria Agnese Pirozzi, Rossella Tomaiuolo, Veronica Moi, Luca Radice, Gender Impact Assessment for medical devices: a compass to find the way in the gender-technology reciprocity

S22.5. Hatina Čorbić, Adnan Beganović, Mahira Redžić, Adnan Šehić, Nusret Salkica, Jasmina Bajrović, Results of daily quality control in computed tomography

S22.6. Dado Latinović, Semra Aliu, Mirsel Smajić, The review of biosensors for non-invasive immunodetection of biomarkers in sweat

10:45 - 12:30 S23. BIOSENSORS AND BIOINSTRUMENTATION (Hall 3)

Session Chair: dr. Felix Fanjul-Velez, Biomedical Engineering group, TEISA Dep., University of Cantabria. Session Co-Chair: Sara Deumić, International Burch University



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*S23.1. Ajla Selimović, Safija Herenda, Edhem Hasković, Mirjana Đermanović, Mirjana Đermanović, **Effect of Cardiolite on Enzyme Activity***

*S23.2. Muhammad Tanweer, Raimo Sepponen, Ihsan Oguz Tanzer, Kari A. Halonen, **Evaluation of Printed Coplanar Capacitive Sensors for Reliable Quantification of Fluids in Adult Diaper***

*S23.3. Sara Deumić, Aida Lavić, Neira Crnčević, Emina Pramenković, Amar Deumić, **Biosensor for rapid methods for the detection of viruses***

*S23.4. Neira Crnčević, Damilola Ajayi, Tarik Zubčević, Sara Deumić, Haris Kolić, **Implantable and Ingestible Biosensors***

*S23.5. Aleksandar Miladinović, Christian Quaia, Miloš Ajčević, Laura Diplotti, Simone Krešević, Stefano Pensiero, Agostino Accardo, **Characteristics of Ocular Following Responses (OFRs) in Children with Stereodeficiencies***

*S23.6. Sonia Buendia-Aviles, Margarita Cunill-Rodríguez, José A. Delgado-Atencio, José L. Arce-Diego, Félix Fanjul-Vélez, **Influence of Tilt Angle and Probe-Sample Distance on Tissue Diagnosis by Diffuse Reflection Spectra***

10:45 - 12:30 S24. HEALTH INFORMATICS, E-HEALTH AND TELEMEDICINE (Hall 4)

***Session Chair:** Dr. Mostafa Haghi, Ubiquitous Computing Laboratory at HTWG Konstanz - University of Applied Sciences. **Session Co-Chair:** Alessio Iannizzotto, University of Pisa*

*S24.1. Alessio Iannizzotto, Sergio Frumento, Danilo Menicucci, Alejandro Luis Callara, Angelo Gemignani, Enzo Pasquale Scilingo, Alberto Greco, **A virtual reality-based setting to investigate how environments and emotionally-laden stimuli interact and compete for accessing consciousness***

*S24.2. Nicola Carbonaro, Marco Laurino, Alberto Greco, Carlotta Marinai, Francesca Giannetti, Francesca Righetti, Francesco Di Rienzo, Gianluca Rho, Lucia Arcarisi, Michele Zanoletti, Pasquale Bufano, Mario Tesconi, Nicola Sgambelluri, Danilo Menicucci, Carlo Vallati, Alessandro Tognetti, **Smart sensors for daily-life data collection toward precision and personalized medicine: the TOLIFE project approach***

*S24.3. Nerma Džaferović, Adna Softić, Armin Elezović, Faruk Gutic, Haris Vranić, Lejla Gurbeta, **Exploring the Progress of Digital Transformation in the Healthcare System of Bosnia and Herzegovina***



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S24.4. Nikitas Karanikolas, Mirjana Ivanovic, Alda Kika, Ridvan Alimehmeti, Christos Skourlas, Medical Engineering, Health Informatics and Medical Imaging (ME&HI) Profession and Curriculum

S24.5. Hrvoje Belani, Tanja Bedovec, Andreja Matkun, Patients' Health Information Exchange within the European Union: a Croatian Case Study

S24.6. Sotirios Gyftopoulos, George Drosatos, Leandro Pecchia, Giuseppe Fico, Eleni Kaldoudi, Interaction between pharmaceutical companies and the public during the COVID-19 pandemic – A Twitter analysis

11:30 – 12:30 STUDENT MEETUP (Conference B2B Space)

Coffee Break

12:45 - 14:00 S25. BIOMECHANICS, ROBOTICS AND MINIMALLY INVASIVE SURGERY (Hall 1)

*Session Chair: Prof. dr. Isak Karabegović, Bosnia and Herzegovina Academy of Science and Arts.
Session Co-Chair: Efthymios Papasoulis, THESSALONIKI MINIMALLY INVASIVE SURGERY ORTHOPAEDIC CENTER - TheMIS*

S25.1. Georgia Peleka, Ioannis Mariolis, Ioannis Kostavelis, Trifon Totlis, Efthymios Papasoulis, Aristotelis Sideridis, Dimitrios Tzovaras, ARTHROprint: A System for the Immediate Restoration of Cartilage Lesions by Implantation of Printable Autologous Cell Scaffolds

S25.2. Sumeja Buljugija, Mevludin Maličević, Mysteries of Phytoplanktonic Robotics

S25.3. Petar Valchanov, Nikolay Dukov, Nikiforos Okkalidis, Zhivko Bliznakov, Creation of anthropomorphic bone phantoms with customized fused filament fabrication 3D printing

S25.4. Isak Karabegović, Lejla Banjanović-Mehmedović, Ermin Husak, Using service robots as the base technology of industry 4.0 for global management of the COVID-19 pandemic

S25.5. Elma Imamović, Anisa Veledar, Zerina Kalić, Adna Softić, Emina Mrđanović, Merima Smajlhodžić-Deljo, Impact of PET and PET/CT radiotracer for evaluating efficacy of CDK4/6 inhibitor therapy in HR-positive HER2-negative metastatic breast cancer



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12:45 - 14:00 S26. MEDICAL PHYSICS, BIOMEDICAL IMAGING AND RADIATION PROTECTION (Hall 2)

Session Chair: Aris Dermitzakis, Biomedical Technology Unit, Dept of Medical Physics, School of Medicine, University of Patras. **Session Co-Chair:** Michal Nohel, Brno University of Technology, FEED

S26.1. Aris Dermitzakis, Martin Pichotka, Antzela Petrai, Moritz Weigt, Nicolas Pallikarakis, 3D Printed Breast Phantoms Materials for X-ray Imaging Techniques

S26.2. Emma Tassi, Federica Goffi, Maria Gloria Rossetti, Marcella Bellani, Benedetta Vai, Federico Calesella, Francesco Benedetti, Anna Maria Bianchi, Paolo Brambilla, Eleonora Maggioni, Multi-scale assessment of harmonization efficacy on resting-state functional connectivity

S26.3. Michal Nohel, Roman Jakubicek, Lenka Blazkova, Vlastimil Valek, Marek Dostal, Petr Ourednicek, Jiri Chmelik, Comparison of spine segmentation algorithms on clinical data from spectral CT of patients with multiple myeloma

S26.4. Aino Reunamo, Markus Hannula, Katri Lindfors, Teemu Tolonen, Kalle Kurppa, Jari Hyttinen, Evaluation of the Effect of Iodine Staining and Sodium Thiosulfate Clearing on the Quality of X-ray Microtomographic Images and Histological Processing of Small Bowel Biopsies

S26.5. Nikolay Dukov, Kristina Bliznakova, Iliyan Kolev, Yanka Baneva, Georgi Valchev, Zhivko Bliznakov, Design and implementation of an in-house built physical phantom for bone density measurements

12:45 - 14:00 S27. ARTIFICIAL INTELLIGENCE IN HEALTHCARE & BIOINFORMATICS AND COMPUTATIONAL BIOLOGY (Hall 3)

Session Chair: Beatriz Merino, Politechnic University of Madrid. **Session Co-Chair:** Petra Nemčková, Brno University of Technology, FEED

S27.1. Lejla Kadrić, Dina Neiroukh, Johannes Wagner, Aida Hajdarpašić, Analysis of microRNAs in Correlation to Astrocytoma

S27.2. Damilola M Ajayi, Emmanuel Ajayi, How inherited thrombophilia affects success rate of IVF treatment in women

S27.3. Lejla Hadžić, Sara Sejdić, Examining the Therapeutic Potential of Stem Cells in Treatment of Infertility



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S27.4. Dženita Omerkić, Adna Ašić, An overview of personalized medicine development through recent advances in genome-wide association studies

S27.5. Jan Jurca, Vratislav Harabis, Roman Jakubicek, Tomas Holecek, Petra Nemcekova, Petr Ourednicek, and Jiri Chmelik, Deep-learning based automatic determination of cardiac planes in survey MRI data

12:45 - 14:00 S28. BIOINFORMATICS AND COMPUTATIONAL BIOLOGY (Hall 4)

Session Chair: Yiota Foka, CERN. **Session Co-Chair:** Dr. Naida Babić Jordamović, Verlab Research Institute

S28.1. Adna Salihović, The Utility of RNA Triplex Formation in Autoimmune Disease: Identification of Therapeutic Dual Synergistic MicroRNAs in Systemic Lupus Erythematosus – A Bioinformatics Approach

S28.2. Paolo Seghetti, Niccolo Biasi, Matteo Mercati, Valentina Hartwig, Andrea Rossi, Marco Laurino, Alessandro Tognetti, Identification of the arrhythmogenic substrate in Brugada Syndrome: a computational study

S28.3. Matteo Mercati, Niccolo Biasi, Paolo Seghetti, Alessandro Tognetti, In silico closed-loop system for the assessment of cardiac pacing algorithms

S28.4. Asja Čampara, Dženan Kovačić, Exploring Psilocybin as a Tool for Studying Parkinsonism-related Psychosis: a Narrative Review Supplemented with a Computational Approach

S28.5. Selma Cifrić Mujezinović, Dado Latinović, Autism Spectrum Disorder - Molecular Mechanisms and Diagnosis

12:45 - 14:00 DMBIUBIH General Assembly (Meeting Room 2)

(Only for DMBIUBIH Members)

14:00 - 15:00 Closing remarks (Hall 4)

- **Announcement of Winners: IFMBE Young Investigator Competition and IFMBE HTA Scientific Challenge – Prof. dr. Ratko Magjarević**
- **Announcement of MEDICON 2026 Venue**

THE END

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