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Dear Attendees,

Similar to 2020, it is unfortunate that we were forced to run our conference virtually, yet again. As you can imagine, the original plan was to host you all in Neuchâtel, Switzerland, to both enjoy both the scientific sessions, as well as, the social events together at the 16th edition of IEEE International Symposium on Medical Measurements and Applications, IEEE MeMeA 2021!

Anyway, we are going to run the symposium at best, enjoying two great keynotes, two great tutorials, and a great scientific program that will develop through a series of very interesting talks as provided by you, the authors of the papers, presented at the Regular Sessions, as well as, four top-interesting Special Sessions.

Please, let me grant a great thanks to all the people that have worked hard to organize such an amazing program: Catherine Dehollain, Sabrina Grassini, Paola Saccomandi, Lorenzo Scalise, and Emiliano Schena. Special thanks go to Taylor Lineberger for taking care of a very long series of issues that have enabled all details going into the right place for this conference. Of course, I also thank Marco Parvis and Pasquale Daponte, who have always supported me along the pathway. So, many thanks from the very bottom of my heart to all of these special persons: the conference exists this year because of them!

Since we are going to run the symposium virtually from Neuchâtel and surrounding regions, we try our best to host you and, therefore, we thought to also organize and offer you a virtual tour from Neuchâtel to the surrounding regions. We will move from Neuchâtel to fly into Lausanne, town of the main campus of EPFL (https://www.epfl.ch/en/) and site of the International Olympic Committee (https://olympics.com/), then to Vevey, a well representative town of the Lavaux’ region (https://www.region-du-leman.ch/en/Z9278/lavaux-unesco-terraced-vineyards), finally to Montreux, town of the very famous Montreux Jazz Festival (https://www.montreuxjazzfestival.com/en/), before moving back to Neuchâtel by through Gruyères: the town of one of the most famous cheese in the world, and of a famous artist that gave the birth to the most famous science-fiction extraterrestrial-specie from Hollywood.

You will also receive a special gift form our conference realized in purpose for you, and inspired to this Swiss artist.

Please, enjoy our region and our symposium, even though only virtually, with joy in your heart to be part of a great community that is deeply contributing to the best of Measurement and Instrumentation for Applications to medical field!

Committee Members
Organizing Committee

General Chairs
Sandro Carrara, EPFL, Lausanne, Switzerland
Catherine Dehollain, EPFL, Lausanne, Switzerland

Honorary Chair
Marco Parvis, Politecnico di Torino, Italy

Technical Program Chairs
Paola Saccomandi, Politecnico di Milano, Italy
Emiliano Schena, Università Campus Bio-Medico di Roma (UCBM), Italy

Special Session Chair
Lorenzo Scalise, Università Politecnica delle Marche, Ancona, Italy

Tutorial Chair
Sabrina Grassini, Politecnico di Torino, Italy

Keynote Chair
Mohanasankar Sivaprakasam, Healthcare Technology Innovation Centre (HTIC), IIT Madras, India

Steering Committee
Gregorio Andria, Politecnico di Bari, Italy
Pasquale Daponte (Chair), Università del Sannio, Italy
Aime Lay Ekuakille, Università del Salento, Italy
Alessandro Ferrero, Politecnico di Milano, Italy
Rafik Goubran, Carleton University, Canada
Sabrina Grassini, Politecnico di Torino, Italy
Voicu Groza, University of Ottawa, Canada
Baki Karaböce, TÜBİTAK UME, Turkey
Marco Parvis, Politecnico di Torino, Italy
Emil Petriu, University of Ottawa, Canada
Octavian Postolache, Instituto Universitário de Lisboa and Instituto de Telecomunicações, Lisboa, Portugal
Sreeraman Rajan, Defence Research and Development Canada-Ottawa, Canada
Sergio Rapuano (Secretary), Università del Sannio, Italy
Mario Savino, Politecnico di Bari, Italy
Wendy van Moer, Vrije Universiteit Brussel, Belgium
Annamaria Varkony-Koczy, Obuda University, Hungary
Zaccaria Del Prete, Università Politecnica delle Marche, Ancona, Italy
Anna Lanzolla, Politecnico di Bari, Bari, Italy
Sandro Carrara, EPFL, Lausanne, Switzerland
Kevin Bennett, Mayo Clinic, Minnesota, United States
Max Cortner, Boston Scientific, Minnesota, United States

Conference Management
Conference Catalysts, LLC
A special thank goes to all reviewers for their important contribution to the scientific program.

Abdelazez, Mohamed
Adamo, Francesco
Ahmad, Mansoor
Aissa, Simone
Al-Neam Auns, Qusai
Apa, Ludovica
Aref, mohamed
Asadi, Somayeh
Attivissimo, Filippo
Bacco, Luca
Bianchi, Leonardo
Bianco Maria, Giovanna
Bifulco, Paolo,
Burattini, Laura
Caligiuri Maria, Eugenia
Capeneri, Lorenzo
Capra, Maurizio
Cardillo, Emanuele
Carnevale, Arianna
Casaccia, Sara
Casillas-Perez, David
Castellini, paolo
Cerri, Graziano
Chan, Adrian
Chiarotti, Paolo
Collins, Toby
Conese, Chiara
Conti, Fabio
Cosoli, Gloria
D'Addio, Giovanni
D'Alonzo, Marco
D'Antoni, Federico
D'Antoni, Anthony
Daponte, Pasquale
De Landro, Martina
De Marchis, Cristiano
De Tommasi, Francesca
De Vita, Elena
De Vito, Luca
Dehollain, Catherine
Del Prete, Zaccaria
Demofonti, Andrea
Di Nardo, Francesco
Di Tocco, Joshua
Donato, Nicola
Durmus, Huseyin
Erogul, Osman
Esposito, Antonio
Fazal Ijaz, Muhammad
Fenech, Marianne
Filosa, Mariangela
Forouzanfar, Mohammad
Fosolau, Cristian
Garay, Natalia
Goubran, Rafik
Grassini, Sabrina
Green, James
Groza, Voicu
Haci, Dorian
Islam, Syed
Karaböce, Baki
Korganbayev, Sanzhar
La Mura, Monica
Lanzolla, Anna,
Lapadula, Valerio
Lay-Ekuakille, Aime
Lo Presti, Daniela
Lombardo, Luca
Lorenzini, Giuseppe
Lucangeli, Leandro
Manzoni, Stefano
Marracci, Mirko
Martinelli, Eugenio
Massaro, Alessandro
Massaroni, Carlo
Mazzilli, Gianluca
Meldoli, Alice
Merone, Mario
Mert, Ahmet
Moccaldi, Nicola
Mohammadi, Ahad
Molinaro, Nunzia
Motto, Ros, Paolo
Mukhopadhyay, Subhas
Orrico, Annalisa
Palermo, Eduaro
Pallotti, Antonio
Paloschi, Davide
Parvis, Marco
Pereira, Jose
Picariello, Francesco
Pietronilla Penna, Maria
Poli, Angelica
Postolache, Octavian
Pullano Salvatore, Andrea
Raiano, Luigi
Rapuano, Sergio
Romano, Chiara
Rossi, Stefano
Russo, Paola
Sabatini, Anna
Sabbadini, Riccardo
Saccomandi, Paola
Salsabili, Sina
Scalise, Lorenzo
Scarpetta, Marco
Schena, Emiliano
Schmid, Maurizio
 Scorza, Andrea
Selzler, Roger
Singh, Sundeeep
Spinsante, Susanna
Taborri, Juri
Tarabini, Marco
Turrisi, Simone
Ukwatta, Eranga
Uthamaraj, Susheil
Wallace, Bruce
Wehde, Mark
Yao, Yumeng
Zaltieri, Martina
Zompanti, Alessandro
Special Sessions Organizers

SPS-1 Advanced measurement techniques and methodologies for the quantitative assessment of gait function in health and pathology
Organizers: Valentina Agostini, Politecnico di Torino, Department of Electronics and Telecommunications, Italy
Cristiano De Marchis, Università degli Studi Roma Tre, Italy
Francesco Di Nardo, Università Politecnica delle Marche, Italy
Sandro Fioretti, Università Politecnica delle Marche, Italy

SPS-2 Wearable sensors in the era of remote and continuous monitoring of physiological and physical parameters
Organizers: Sara Casaccia, Università Politecnica delle Marche, Ancona, Italy
Lorenzo Scalise, Università Politecnica delle Marche, Ancona, Italy

SPS-3 From implantable devices to Smart Dust: solutions and challenges for a micro and nano scale precision and personalized medicine
Organizers: Danilo Demarchi, Politecnico di Torino, Italy
Paolo Motto Ros, Politecnico di Torino, Italy

SPS-4 The measurement and assessment of well-being during the Covid-19 pandemic: Implications in neurosciences, psychology and psychiatry.
Organizers: Eraldo Francesco Nicotra, University of Cagliari, Italy
Giorgio Marchese, National Research Council of Italy, Italy
Mirian Agus, University of Cagliari, Italy
Maria Pietronilla Penna, University of Cagliari, Italy
Pier Luigi Marconi, Artemis Neurosciences, Italy

Best Paper Awards

Domenico Grimaldi Best Paper Award
The “Domenico Grimaldi Best Paper Award” will be awarded to the best paper presented at the conference.

The best paper will be selected based on the technical quality and the review process of the initial full paper.

Best Student Paper Award
The Best Student Paper Award will be assigned to a paper whose first author is a student (undergraduate/PhD student) and marked as student paper on EDAS. The paper must be presented by the student.

The Best Student Paper will be selected based on the technical quality and the review process of the initial full paper.

Best Women in Engineering Paper Award
The Best Women in Engineering Paper Award will be assigned to a paper, whose first author is a woman who present it.

The Best Women in Engineering Paper will be selected based on the technical quality and the review process of the initial full paper.

All winners will be notified during the Symposium by email and announced by a virtual presentation, which will be uploaded on the MeMeA 2021 virtual conference platform by June 25, 2021. The awards winners will be also published on the MeMeA 2021 website and will receive a certificate following the conference.
Tutorial Speakers

Marco Carminati, Professor, Politecnico di Milano, Italy

“Charge Measuring Electronics in Medical Applications”

Marco Carminati, was born in 1981 in Milan (Italy). He received B. Sc. and M. Sc. in Electronic Engineering, both magna cum laude from Politecnico di Milano, in 2003 and 2005 respectively. In 2006 he joined DEI (Politecnico di Milano) and he completed the PhD in 2009, focusing on low-noise analog design and (bio)-
electronic instrumentation. In 2007 he was awarded a Progetto Roberto Rocca Fellowship and spent the 2008 spring semester at MIT (USA) as a visiting student in prof. Joel Voldman’s group, working on BioMEMS and microfluidics. From 2010 to 2015 he was post-doc researcher in the group of prof. Marco Sampietro contributing to the invention of original micro-sensors based on high-resolution impedance detection for silicon photonics and environmental monitoring. Since 2014 he is teacher of the “Biochip” course and serves as secretary of the IEEE I&M TC-34. Since 2016 he is Assistant Professor (tenure track) in the group led by prof. Carlo Fiorini, focusing on low-noise nuclear electronics, with applications spanning from medical imaging to neutrino physics.

He has co-authored 160+ peer-reviewed international publications (1770+ citations, h-index = 21), holds 4 patents and was awarded 3 best paper awards at IEEE conferences. He is IEEE Senior member and serves as Editor of IEEE TBioCAS.

Jean-Marie Fürbringer, Research Associate, EPFL, Switzerland

“A Gentle Introduction to DOE”

Jean-Marie Fürbringer graduated with a degree in Physics at EPFL in 1987. Developing his doctoral research on sensitivity analysis of simulation models, he was awarded the doctoral degree by EPFL in 1992.

From 1995 to 1997, Dr Fürbringer was visiting researcher at the NIST in Gaithersburg (Maryland).

In 1997, Dr Fürbringer was appointed visiting professor with the Faculty of Engineering Science at the Catholic University of Lima (PUCP). While at PUCP, he also established and managed the Learning Center of Graña y Montero, which provides training and competency management for the five companies of the group.

In 2001, Dr Fürbringer joined the laboratory of production and processes (LGPP) at EPFL where he led and managed several research projects on competency management and engineering education.

From 2007 to 2010, he was deputy director of the Institute of Mechanical Engineering.

Dr Fürbringer was appointed to the position of deputy dean of the EPFL Doctoral School in 2010 where he has worked till fall 2013.

From November 2013 he has been attached to the Section of Physics as research associate.

Professor Giorgino is Professor of Endocrinology and Metabolism and Chairman of the Department of Emergency and Organ Transplantation at the University of Bari Aldo Moro. He is also Chief of the Division of Endocrinology at the University Hospital Policlinico Consorziale, Bari, Italy. Professor Giorgino received his medical degree from the University of Bari Aldo Moro and his PhD from the University of Naples Federico II, Italy. After completing his clinical and research training in endocrinology and metabolism at the University of Catania, Italy, he worked for several years at the Joslin Diabetes Center and Harvard Medical School, Boston, MA, USA, first as a postdoctoral research fellow and then as a visiting scientist.

Professor Giorgino has received distinguished scientific awards from various international and national institutions, including the Juvenile Diabetes Research Foundation International Fellowship (New York, NY, USA), the Mary K. Iacocca Foundation Fellowship (Boston, MA, USA), the Glaxo-Wellcome Award from the European Association for the Study of Diabetes, the Aldo Pinchera and Cassano Awards from the Italian Society of Endocrinology, and the Alcmeone Award from the Italian Society of Diabetology. He has been the Italian delegate in various European Commission Cooperation in Science and Technology actions for diabetes research. Professor Giorgino has served on many national commissions and national boards, including the Executive Committees and Scientific Committees of the Italian Society of Diabetology and of the Italian Society of Endocrinology.

He is currently President of the Italian Society of Endocrinology. He is, or has been, an editorial board member for the following journals: PLoS ONE, Journal of Endocrinology, Endocrinology, Journal of Endocrinological Investigation, Adipocyte, Acta Diabetologica, Cardiorenal Medicine, and Diabetes/Metabolism Research and Reviews. He has published more than 200 original and review articles in prestigious scientific journals and has been an invited speaker at many national and international meetings. Professor Giorgino’s research interests include the mechanisms leading to insulin resistance and beta-cell dysfunction in Type 2 diabetes with a particular focus on skeletal muscle metabolism and organ cross-talk, inflammation and lipotoxicity, and the effects of diabetes drugs on pancreatic islets and the cardiovascular system. He has also been involved in several clinical trials investigating the effects of glucose-lowering drugs in individuals with Type 2 diabetes. He has an H-index of 56 and over 10,000 citations (Google Scholar).
Keynote Speakers

Michele Diana, Medical Scientific Director, IRCAD, France

“Endoscopic Luminescent Imaging for Oncologic Surgery: the ELIOS project”

Michele Diana, MD, Ph.D obtained the Medical Degree in Rome, Italy, and specialized in general surgery in Switzerland. He obtained a Ph.D in Medical Sciences and received the Venia Legendi at the University of Strasbourg (France). He is Scientific Director of the Research Institute against Cancer of the Digestive System (IRCAD), Strasbourg and the responsible of the Photonics for Health department of the ICube Lab (Strasbourg). He is faculty member of leading scholar surgical societies, including the European Association of Endoscopic Surgery (EAES), the International Society of Fluorescence Guided Surgery (ISFGS) and the International Society of Medical Innovation and Technology (iSMIT). His main translational research interests are image-guided surgery, virtual and augmented reality, optical imaging navigation systems, molecular fluorescence guided surgery, surgical robotics and machine and deep learning. He has authored more than 150 peer-reviewed papers and book chapters (h-index 32).

Taesung Kim, Professor, Sungkyunkwan University, South Korea

“Optical Fiber Sensors for Various Applications”

Dr. Taesung Kim received his Bachelor’s in Mechanical Engineering from Seoul National University, Korea in 1994. He received his Master’s, and Ph. D. in Mechanical Engineering from University of Minnesota, USA in 1998 and 2002, respectively. He joined Seagate Technology in 2002 and worked as Sr./Staff Engineer in Recording Head R&D. Since 2005 Dr. Kim has been a professor in the School of Mechanical Engineering and SKKU Advanced Institute of Nanotechnology (SAINT), Sungkyunkwan University in Suwon, Korea. In 2014, he was appointed as SKKU Young Fellow and started working for SKKU Research & Business Foundation as a Vice President. His research interests include 2-D material synthesis, optical fiber sensors, semiconductor/display manufacturing process (CMP, cleaning and contamination control), and atmospheric/indoor aerosol control.
<table>
<thead>
<tr>
<th>Time</th>
<th>Session 1</th>
<th>Session 2</th>
<th>Session 3</th>
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<tr>
<td>8:30-9:00</td>
<td>Registration Opens</td>
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<tr>
<td>9:00 – 10:00</td>
<td>Keynote Speaker</td>
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<td>Michele Diana- Medical Scientific Director, IRCAD</td>
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<td>“Endoscopic Luminescent Imaging for Oncologic Surgery: the ELIOS project”</td>
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<tr>
<td>10:00-11:20</td>
<td>RS1- Bioengineering, rehabilitation and biomedical robotic methods - A</td>
<td>RS5- Instrumentation and processing techniques for biosignals – A</td>
<td>RS9- Measurement Systems for Supportive Technology</td>
</tr>
<tr>
<td>11:30-12:50</td>
<td>RS2- Bioengineering, rehabilitation and biomedical robotic methods - B</td>
<td>RS6- Instrumentation and processing techniques for biosignals – B</td>
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<td>13:00-14:00</td>
<td>BREAK</td>
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<tr>
<td>14:00-15:20</td>
<td>RS3- Instrumentation and Measurements for intervention in clinical settings</td>
<td>RS7- Instrumentation and processing techniques for biosignals – C</td>
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<tr>
<td>15:30-16:50</td>
<td>RS22- Health monitoring</td>
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<td>RS23- Metrology, Medical Instrumentation Uncertainty and Calibrations – B</td>
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<tr>
<td>17:00-18:00</td>
<td>Welcome Reception/Virtual Tour</td>
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<td>Time</td>
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| 9:00 – 10:00 | Keynote Speaker  
Taesung Kim- Sungkyunkwan University, South Korea  
“Optical Fiber Sensors for Various Applications” | RS10- Advances in biomedical sensors and Instrumentation - A  
RS13- Metrology, Medical Instrumentation Uncertainty and Calibrations – A  
SS2-I- Wearable sensors in the era of remote and continuous monitoring of physiological and physical parameters I |  
| 10:00-11:20 | RS10- Advances in biomedical sensors and Instrumentation - A  
RS13- Metrology, Medical Instrumentation Uncertainty and Calibrations – A  
SS2-I- Wearable sensors in the era of remote and continuous monitoring of physiological and physical parameters I | RS11- Advances in biomedical sensors and Instrumentation - B  
RS8- Measurements and Instrumentation for monitoring cardiovascular parameters  
SS2-II- Wearable sensors in the era of remote and continuous monitoring of physiological and physical parameters II |  
| 11:30-12:50 | RS11- Advances in biomedical sensors and Instrumentation - B  
RS8- Measurements and Instrumentation for monitoring cardiovascular parameters  
SS2-II- Wearable sensors in the era of remote and continuous monitoring of physiological and physical parameters II |  
| 13:00-14:00 | BREAK                                           |                                                            |  
| 14:00-15:20 | RS12- Advances in biomedical sensors and Instrumentation - C |                                                            | SS2- III- Wearable sensors in the era of remote and continuous monitoring of physiological and physical parameters III |
| 15:30-16:50 | RS24- Measurement systems for cognitive and behavioural monitoring |                                                            | SS3- From implantable devices to Smart Dust: solutions and challenges for a micro and nano scale precision and personalized medicine |
| 17:00-18:00 | Tutorial  
Jean-Marie Fürbringer- EPFL, Switzerland  
“A Gentle Introduction to DOE” |                                                            |                                                                          |
<table>
<thead>
<tr>
<th>Time</th>
<th>Tutorial</th>
<th>Session A</th>
<th>Session B</th>
<th>Session C</th>
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<tbody>
<tr>
<td>8:30 – 10:00</td>
<td>Tutorial Marco Carminati, Politecnico di Milano, Italy “Charge Measuring Electronics in Medical Applications”</td>
<td>RS14- Processing of biomedical signals – A</td>
<td>RS18- Advances in biomedical sensors and Instrumentation – D</td>
<td>SS1-I- Advanced measurement techniques and methodologies for the quantitative assessment of gait function in health and pathology I</td>
</tr>
<tr>
<td>10:00-11:20</td>
<td>RS14- Processing of biomedical signals – A</td>
<td>RS18- Advances in biomedical sensors and Instrumentation – D</td>
<td>SS1-II- Advanced measurement techniques and methodologies for the quantitative assessment of gait function in health and pathology II</td>
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<tr>
<td>11:30-12:50</td>
<td>RS15- Processing of biomedical signals – B</td>
<td>RS19- Physiological measurements</td>
<td>SS1-II- Advanced measurement techniques and methodologies for the quantitative assessment of gait function in health and pathology II</td>
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<tr>
<td>13:00-14:00</td>
<td>BREAK</td>
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</tr>
<tr>
<td>14:00-15:20</td>
<td>RS16- Image processing - A</td>
<td>RS20- Processing of biomedical signals – C</td>
<td>SS1-III- Advanced measurement techniques and methodologies for the quantitative assessment of gait function in health and pathology III</td>
<td>SS4-I- The measurement and assessment of well-being during the Covid-19 pandemic: Implications in neurosciences, psychology and psychiatry I</td>
</tr>
<tr>
<td>15:30-16:50</td>
<td>RS22- Health monitoring</td>
<td>RS23- Metrology, Medical Instrumentation Uncertainty and Calibrations – B</td>
<td>SS4-II- The measurement and assessment of well-being during the Covid-19 pandemic: Implications in neurosciences, psychology and psychiatry II</td>
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</tr>
<tr>
<td>17:00-18:00</td>
<td>Award Ceremony and Closing Session</td>
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</tbody>
</table>
### Keynote Speech

**Title:** Endoscopic Luminescent Imaging For Oncologic Surgery: The ELIOS Project  
**Chairs:** Paola Saccomandi (Politecnico di Milano, Italy)

### 10:00 Statistical correlation analysis between kinematic features and clinical indexes and scales for obese patients

Giuseppe Cesarelli (University of Naples & Federico II)  
Leandro Donisi (University of Naples Federico II, Italy)  
Giovanni Di Caprio (ICS Maugeri SPA SB, Italy)  
Michelina Scioli (ICS Maugeri SPA SB, Italy)  
Arcangelo Biancardi (ICS Maugeri SPA SB)  
Giovanni D’Addio (ICS Maugeri SPA SB)

### 10:20 Repeatability of kinematic parameters related to the Timed Up and Go Test in patients with gait impairments

Gaetano Pagano (ICS Maugeri SPA of Bari, Italy)  
Leandro Donisi (University of Naples Federico II, Italy)  
Vito Marsico (ICS Maugeri SPA SB, Italy)  
Ernesto Losavio (ICS Maugeri SPA SB, Italy)  
Mario Cesarelli (University of Naples Federico II, Italy)  
Giovanni D’Addio (S. Maugeri Foundation, Rehabilitation Institute of Telese, Italy)

### 10:40 Sensors for Assistive Robotic Drinking with Physical Contact

Steffen Schöllmann (Westphalian University of Applied Sciences, Germany)  
Pieter Try (Westphalian University of Applied Sciences, Germany)  
Lukas Wöhle (Westphalian University of Applied Sciences, Germany)  
Marion Gebhard (Westphalian University of Applied Sciences, Germany)

### 11:00 Mechanical Design of a Modular Gripper for Rehabilitation of Stroke Patients with Hemiplegia

Qing Zhu (Anhui University of Technology, China)  
Jie Jin (Anhui University of Technology, China)  
Qingyun Liu (Anhui University of Technology, China)  
Mingxing Yang (Anhui University of Technology, China)  
Heping Tong (Anhui University of Technology, China)

### 10:00 Comparison of different similarity measures in hierarchical clustering

Marica Vagni (Politecnico di Torino, Italy)  
Noemi Giordano (Politecnico di Torino, Italy)  
Gabriella Balestra (Politecnico di Torino, Italy)  
Samanta Rosati (Politecnico di Torino, Italy)

### 10:20 Impact of Subject-specific Training Data in Anxiety Level Classification from Physiologic Data

Roger Selzler (Carleton University, Canada)  
Adrian D.C. Chan (Carleton University, Canada)  
James R Green (Carleton University, Canada)

### 10:40 Cross Teager-Kaiser operator and Lempel-Ziv Index for the assessment of human posturographic data

Andrea Tigrini (Università Politecnica delle Marche, Italy)  
Federica Verdini (Università Politecnica delle Marche, Italy)  
Sandro Fioretti (Università Politecnica delle Marche, Italy)  
Rosa Anna Rabini (INRCA Geriatric Hospital, Italy)  
Oriano Mercante (INRCA Geriatric Hospital, Italy)  
Alessandro Mengarelli (Università Politecnica delle Marche, Italy)

### 11:00 Efficient feature selection for electroencephalogram-based authentication

Nibras Abo Alzahab (Università Politecnica delle Marche, Italy)  
Marco Baldi (Università Politecnica delle Marche, Italy)  
Lorenzo Scalise (Università Politecnica delle Marche, Italy)
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
</table>
| 10:00-11:20 | RS9: Measurement Systems for Supportive Technology | **Title:** Electronic Travel Aid for Visually Impaired People: Design and Experimental of a Special Antenna<br>**Authors:** Alfredo De Leo (Università Politecnica dell Marche, Italy)<br>Paola Russo (Università Politecnica delle Marche, Italy)<br>Graziano Cerri (Università Politecnica delle Marche, Italy)<br>**Title:** Measurement and Characterization of Hearing Protection Devices in the Presence of Impulse Sound<br>**Authors:** Bruno Tardif (Carleton University & National Defence - Canada, Canada)<br>David Lo (National Defence, Canada)<br>Rafik Goubran (Carleton University, Canada)<br>**Title:** Supportive Smart Home Systems: Utilization Assessment for Internet Service Provider Networks<br>**Authors:** Saif Almhairat (Carleton University, Canada)<br>Bruce Wallace (AGE-WELL NIH SAM3 & Carleton University, Canada)<br>Julien Larivières-Chartier (Bruyère Research Institute, Canada)<br>Ali El-haraki (Telus, Canada)<br>Rafik Goubran (Carleton University, Canada)<br>Frank Knoefel (Bruyère Continuing Care, Canada)<br>**Title:** Innovative Smart Face Mask to Protect Workers from COVID-19 Infection<br>**Authors:** Andrea Fois (2C Technologies Srl - University of Cagliari (Italy), Italy)<br>Filippo Tocco (University of Cagliari, Italy)<br>Antonio Dell'Osa (2C Technologies Srl - University of Cagliari, Italy)<br>Laura Melis (2C Technologies Srl – University of Cagliari, Italy)<br>Ugo Bertelli (2C Technologies Srl - University of Cagliari, Italy)<br>Alberto Concu (University of Cagliari, Italy)<br>Andrea Manuelli Bertetto (Politecnico di Torino, Italy)<br>Carmen Serra (Politecnico di Torino, Italy)<br>**Title:** Gait events detection from heel and toe trajectories: comparison of methods using multiple datasets<br>**Authors:** Vânia Guimarães (Fraunhofer Portugal AICOS, Portugal)<br>Ines Sousa (Fraunhofer Portugal AICOS, Portugal)<br>Miguel Correia (FEUP, Portugal)<br>**Title:** Kinect-based wearable prototype system for ataxic patients neurorehabilitation: software update for exergaming and rehabilitation<br>**Authors:** Michela Franzo’ (Sapienza, University of Rome, Italy)<br>Simona Pascucci (Sapienza, University of Rome, Italy)<br>Mariano Serrao (University of Rome Sapienza, Italy)<br>Franco Marinozzi (Sapienza University of Rome, Italy)<br>Fabiano Bini (SAPIENZA University of Rome, Italy)<br>**Title:** Using Zigbee Sensors for Ambient Measurement of Human Gait - Analytical Considerations<br>**Authors:** Ashi Agarwal (Carleton University, Ottawa, Canada)<br>Bruce Wallace (AGE-WELL NIH SAM3 & Carleton University, Canada)<br>Laura Ault (Carleton University & Bruyère Research Institute, Canada)<br>Julien Larivières-Chartier (Bruyère Research Institute, Chartier)<br>Frank Knoefel (Bruyère Continuing Care, Canada)<br>Rafik Goubran (Carleton University, Canada)<br>Jeffrey Kaye (Oregon Center for Aging & Technology, Canada)<br>Zachary Beattie (Oregon Health and Science University, USA)<br>Neil Thomas (Bruyère Research Institute, Canada)<br>**Title:** Multi-Segments Kinematic Model of the Human Spine during Gait<br>**Authors:** Elisa Panerò (Politecnico di Torino, Italy)<br>Elisa Digo (Politecnico di Torino, Italy)<br>Virginia Ferrarese (Politecnico di Torino, Italy)<br>Ugo Dimanico (Università degli Studi di Torino, Italy)<br>Laura Gastaldi (Politecnico di Torino, Italy)
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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>11:30-12:50</td>
<td><strong>RS4: Estimation of tissue physical properties</strong></td>
<td>Chairs: Joseph Cortner (Retired, USA), Zaccaria Del Prete (SAPIENZA University of Rome, Italy)</td>
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<tr>
<td>12:10</td>
<td>A Simple Instrument to Measure the Thermal Transport Properties of the Human Skin</td>
<td>Asier Zubiaga (ZHAW Zurich University of Applied Science, Switzerland) Christoph Kirsch (ZHAW Zurich University of Applied Science, Switzerland) Mathias Bonmarin (Zurich University of Applied Sciences, Switzerland)</td>
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<tr>
<td>11:30-12:50</td>
<td><strong>RS6: Instrumentation and processing techniques for biosignals - B</strong></td>
<td>Chairs: Paola Saccomandi (Politecnico di Milano, Italy), Pasquale Daponte (University of Sannio, Italy)</td>
</tr>
<tr>
<td>11:30</td>
<td>Length of Stay Analysis at Neonatal Care Units with Data Science - Preliminary Results</td>
<td>Joao Rala Cordeiro (ISCTE-IUL, Lisbon University Institute &amp; Instituto de Telecomunicações, IT-IUL, Portugal) Octavian Adrian Postolache (Instituto de Telecomunicações, Lisboa/IT &amp; Instituto Universitario de Lisboa, ISCTE-IUL, Portugal)</td>
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<tr>
<td>11:50</td>
<td>Comparison of Software Packages for the Analysis of Continuous Glucose Monitoring Data</td>
<td>Agnese Piersanti (Università Politecnica delle Marche, Italy) Francesco Giurato (Università Politecnica delle Marche, Italy) Laura Burattini (Università Politecnica delle Marche, Italy) Andrea Tura (CNR Institute of Neuroscience, Italy) Micaela Morettini (Università Politecnica delle Marche, Italy)</td>
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<tr>
<td>12:10</td>
<td>TSEA: An Open-Source Python-Based Annotation Tool for Time Series Data</td>
<td>Roger Selzler (Carleton University, Canada) Adrian D.C. Chan (Carleton University, Canada) James R Green (Carleton University, Canada)</td>
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<tr>
<td>12:30</td>
<td>Statistical Analysis of Mental Stress During Oral Presentation</td>
<td>Antony Raj (Project Engineer, India) Vaishali B (Indian Institute of Technology, Madras, India) Deepak Vagish (HTIC, IIT Madras, India) Sricharan V (HTIC, IIT Madras, India) Preejith Sp (HTIC-IITMadras, India) Mohanasankar Sivaprakasam (IIT Madras, India)</td>
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<tr>
<td>13:00-14:00</td>
<td>Break</td>
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</table>
### RS3: Instrumentation and Measurements for intervention in clinical settings

**Chairs:** Somayeh Asadi (Politecnico di Milano, Italy), Sundeep Singh (Wilfrid Laurier University, Canada)

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<tr>
<th>Session</th>
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<tr>
<td>14:00</td>
<td>A Deep Learning Force Estimator System for Intracardiac Catheters</td>
<td>Pedram Fekri (Concordia University, Canada) Hamid Reza Nourani (Concordia University, Canada) Masoud Razban (Concordia University, Canada) Mehrdad H Zadeh (Kettering University, USA) Javad Dargahi (Concordia University, Canada) Ahmadrereza Arshi (Amirkabir University of Technology, Iran)</td>
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<tr>
<td>14:20</td>
<td>Feedback-controlled thermal therapy of tissues based on fiber Bragg grating thermometers</td>
<td>Sanzhar Korganbayev (Politecnico di Milano, Italy) Annalisa Orrico (Politecnico di Milano, Italy) Leonardo Bianchi (Politecnico di Milano, Italy) Martina De Landro (Politecnico di Milano, Italy) Alexey Wolf (Institute of Automation and Electrometry SB RAS, Russia) Alexander Dostovalov (Novosibirsk State University, Russia) Paola Saccomandi (Politecnico di Milano, Italy)</td>
</tr>
<tr>
<td>14:40</td>
<td>Controlled photothermal therapy based on temperature monitoring: theoretical and experimental analysis</td>
<td>Annalisa Orrico (Politecnico di Milano, Italy) Leonardo Bianchi (Politecnico di Milano, Italy) Sanzhar Korganbayev (Politecnico di Milano, Italy) Martina De Landro (Politecnico di Milano, Italy) Paola Saccomandi (Politecnico di Milano, Italy)</td>
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<tr>
<td>15:00</td>
<td>Measurement of Enhanced Photothermal Effects of CuO-encapsulated Polymeric Nanospheres</td>
<td>Sanzhar Korganbayev (ORT Braude College, Italy) Somayeh Asadi (Politecnico di Milano, Italy) Inbal Maor (ORT Braude College, Italy) Emiliano Schena (University Campus Bio-Medico of Rome, Italy) Haim Azhari (Technion, Israel) Iris Weitz (ORT Braude College, Israel) Paola Saccomandi (Politecnico di Milano, Italy)</td>
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</table>

### RS7: Instrumentation and processing techniques for biosignals - C

**Chairs:** Soroor Behbahani (Islamic Azad University South Tehran Branch, Iran), Salvatore Andrea Pullano (University Magna Graecia of Catanzaro, Italy)

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<thead>
<tr>
<th>Session</th>
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<th>Authors</th>
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<tbody>
<tr>
<td>14:00</td>
<td>Simultaneous Measurement of Heartbeat Intervals and Respiratory Signal using a Smartphone</td>
<td>Marco Scarpetta (Polytechnic University of Bari, Italy) Maurizio Spadavecchia (Polytechnic University of Bari, Italy) Gregorio Andria (Politecnico di Bari, Italy) Mattia Alessandro Ragolia (Politecnico di Bari, Italy) Nicola Giaquinto (Politecnico di Bari, Italy)</td>
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<tr>
<td>14:20</td>
<td>An Efficient Near-lossless Compression Algorithm for Multichannel EEG signals</td>
<td>Giuseppe Campobello (University of Messina, Italy) Angelica Quercia (University of Messina, Italy) Giovanni Gugliandolo (University of Messina, Italy) Antonino Segreto (University of Messina, Italy) Elisa Tatti (CUNY School of Medicine, USA) Maria Ghilardi (CUNY School of Medicine, USA) Giovanni Crupi (University of Messina, Italy) Angelo Quartarone (University of Messina, Italy) Nicola Donato (University of Messina, Italy)</td>
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<tr>
<td>14:40</td>
<td>Deterministic Compressed Sensing of heart sound signals</td>
<td>Pasquale Daponte (University of Sannio, Italy) Luca De Vito (University of Sannio, Italy) Grazia Iadarola (University of Sannio, Italy) Francesco Picariello (University of Sannio, Italy) Sergio Rapuano (University of Sannio, Italy)</td>
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<td>15:00</td>
<td>Non-Linear and Chaos-based Analysis of Electroretinogram</td>
<td>Soroor Behbahani (Islamic Azad University, South Tehran Branch, Iran) Sreeraman Rajan (Carleton University, Canada)</td>
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</table>
15:30-16:50
RS22: Health monitoring
Chairs: Luca De Vito (University of Sannio, Italy), Daniela Lo Presti (Università Campus Bio-Medico di Roma, Italy)

15:30 A Wearable SSVEP BCI for AR-based, Real-time Health Monitoring Applications
Pasquale Arpaia (University of Naples Federico II, Italy)
Egidio De Benedetto (University of Naples Federico II, Italy)
Nicola Donato (University of Messina, Italy)
Luigi Duraccio (Polytechnic University of Turin (Italy))
Nicola Moccaldi (University of Naples Federico II, Italy)

15:50 mHealth application for remote health monitoring useful during the COVID 19 pandemic
Virginia Sandulescu (National Institute of Research and Studies for Communications, Romania)
Sorin Puşcoci (National Institute for Studies and Research in Communications, Romania)
Monica Petre (National Institute for Studies and Research in Communications, Romania)
Minodora Dumitrache (National Institute for Studies and Research in Communications, Romania)
Viorel Bota (ElisaMed, Romania)
Alexandru Gîrlea (QuickWeb Info, Romania)

16:10 Multiple Input, Single Output Frequency Mixing Communication Technique for Low Power Data Transmission
Giuliana Emmolo (Politecnico di Torino, Italy & Imperial College, United Kingdom, Great Britain)
Daryl Ma (Imperial College London, United Kingdom, Great Britain)
Danilo Demarchi (Politecnico di Torino, Italy)
Pantelis Georgiou (Imperial College London, United Kingdom, Great Britain)

15:30-16:20
RS23: Metrology, Medical Instrumentation Uncertainty and Calibrations - B
Chairs: Pasquale Daponte (University of Sannio, Italy), Marco Parvis (Politecnico di Torino, Italy)

15:30 Impact of face coverings on the cough measurement characterization
Madison Cohen-McFarlane (Carleton University, Canada)
Pengcheng Xi (National Research Council Canada, Canada)
Bruce Wallace (AGE-WELL NIH SAM3 & Carleton University, Canada)
Julio Valdes (Researcher at the National Research Council of Canada, Canada)
Rafik Goubran (Carleton University, Canada)
Frank Knoefel (Bruyere Continuing Care, Canada)

15:50 Reducing effect of magnetic field noise on sensor position estimation in surgical EM tracking
Mattia Alessandro Ragolia (Politecnico di Bari, Italy)
Filippo Attivissimo (Politecnico of Bari, Italy)
Attilio Di Nisio (Politecnico di Bari, Italy)
Anna Maria Lucia Lanzolla (Polytechnic of Bari, Italy)
Marco Scarpetta (Polytechnic University of Bari, Italy)

16:10 A novel Sensitivity Index from the Flow Velocity Variation in Quality Control for PW Doppler: a preliminary study
Giorgia Fiori (Roma Tre University, Italy)
Fabio Fuiano (Roma Tre University, Italy)
Andrea Scorza (Roma TRE University, Italy)
Maurizio Schmid (Roma Tre University, Italy)
Jan Galo (IRCCS Children Hospital Bambino Gesù, Italy)
Silvia Conforto (University Roma Tre, Italy)
Salvatore Andrea Sciuto (University of ROMA TRE, Italy)

17:00-18:00
Welcome Reception/Virtual Tour
### 9:00-10:00
**Keynote Speech**

"Optical Fiber Sensors for Various Applications"

**Chairs:** Emiliano Schena (University Campus Bio-Medico of Rome, Italy)

### 10:00-11:20
**RS10: Advances in biomedical sensors and Instrumentation - A**

**Chair:** Luca Lombardo (Politecnico di Torino, Italy), Fabrizio Spano (ZHAW Zurich University of Applied Science, Switzerland)

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<tr>
<th>10:00</th>
<th>RL-EGOFET cell biosensors: A novel approach for the detection of action potentials</th>
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<tr>
<td>Giada Giorgi (University of Padova, Italy)</td>
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<td>Nicolò Lago (Università di Padova, Italy)</td>
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<td>Sarah Tonello (University of Padova, Italy)</td>
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<td>Alessandra Galli (University of Padova, Italy)</td>
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<td>Marco Buonuomo (Università di Padova, Italy)</td>
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<td>Andrea Cester (University of Padova, Italy)</td>
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<th>10:20</th>
<th>A Capacitive Color Changing Electronic Skin for Touch Sensing Applications</th>
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<tr>
<td>Fabrizio Spano (ZHAW - Zurich University of Applied Sciences, Switzerland)</td>
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<th>10:40</th>
<th>Equivalent Circuit Analysis of CMUTs-based Device for Measurement in Liquid Samples</th>
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<tr>
<td>Yihe Zhao (Xi'an Jiaotong University, China)</td>
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<td>Libo Zhao (Xi'an Jiaotong University, China)</td>
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<td>Gian Luca Barbruni (EPFL, Switzerland)</td>
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<td>Zhikang Li (Xi'an Jiaotong University, China)</td>
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<td>Zhuangde Jiang (Xi'an Jiaotong University, China)</td>
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<td>Sandro Carrara (EPFL, Switzerland)</td>
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<th>11:00</th>
<th>Parametric analysis for the design of hip joint replacement simulators</th>
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<tr>
<td>Shams Torabnia (KOC University, Turkey)</td>
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<td>Şenay Mihçin (Izmir Institute of Technology, Turkey)</td>
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<td>İsmail Lazoğlu (KOC University, Turkey)</td>
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### 10:00-11:20
**RS13: Metrology, Medical Instrumentation Uncertainty and Calibrations - A**

**Chairs:** Andrea Scorza (Roma TRE University, Italy), Baki Karaböce (TÜBİTAK UME & National Metrology Institute of Turkey, Turkey)

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<tr>
<th>10:00</th>
<th>Comparison of Portable Calibrator Produced in TUBITAK UME for the Calibration of Infrared Ear Thermometers with the Primary Calibration System</th>
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<tr>
<td>Hüseyin Okan Durmuş (National Metrology Institute, Turkey)</td>
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<td>Baki Karaböce (TÜBİTAK UME &amp; National Metrology Institute of Turkey, Turkey)</td>
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<tr>
<th>10:20</th>
<th>Repeatability and reproducibility in the breathability measurement of surgical masks</th>
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<tr>
<td>Juri Taborri (University of Tuscia, Viterbo, Italy)</td>
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<td>Beatrice Stocchi (University of Tuscia, Viterbo, Italy)</td>
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<td>Giuseppe Calabrò (University of Tuscia, Italy)</td>
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<td>Stefano Rossi (University of Tuscia, Italy)</td>
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<tr>
<th>10:40</th>
<th>A preliminary study on the dynamic characterization of a MEMS microgripper for biomedical applications</th>
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<tr>
<td>Federica Vurchio (University Roma Tre, Italy)</td>
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<td>Gabriele Bocchetta (Roma Tre University, Italy)</td>
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<td>Giorgia Fiori (Roma Tre University, Italy)</td>
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<td>Andrea Scorza (Roma TRE University, Italy)</td>
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<td>Nicola Pio Belfiore (Roma Tre University, Italy)</td>
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<td>Salvatore Andrea Sciuto (University of ROMA TRE, Italy)</td>
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<tr>
<th>11:00</th>
<th>Characterization of Muscle Phantom Used in Calibration of Physiotherapy Ultrasound: Measurement of Acoustic Parameters of Phantom</th>
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<tr>
<td>Nesilîah Gün (Marmara University Institute of Health Sciences &amp; İstanbul Arel University, Turkey)</td>
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<tr>
<td>Baki Karaböce (TÜBİTAK UME &amp; National Metrology Institute of Turkey, Turkey)</td>
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<td>Ufuk Yurdalan (Marmara Universities, Turkey)</td>
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</tbody>
</table>
10:00 A smart face mask based on photoplethysmography for cardiorespiratory monitoring in occupational settings
Riccardo Sabbadini (Università Campus Bio-Medico di Roma, Italy)
Joshua Di Tocco (Università Campus Bio-Medico di Roma, Italy)
Massimiliano Carassiti (Università Campus Bio-Medico di Roma, Italy)
Carlo Massaroni (Università Campus Bio-Medico di Roma, Italy)
Emiliano Schena (University Campus Bio-Medico of Rome, Italy)

10:20 Measuring the Effect of Rhythmic Auditory Stimuli on Parkinsonian Gait in Challenging Settings
Ilaria Mileti (University Niccolò Cusano, Italy)
Marco Germanotta (Don Carlo Gnocchi Onlus Foundation, Milan, Italy)
Chiara Iacovelli (Fondazione Policlinico Universitario Agostino Gemelli IRCCS, Rome, Italy)
Giulia Di Lazzaro (Università degli studi di Roma Tor Vergata, Italy)
Zaccaria Del Prete (SAPIENZA University of Rome, Italy)
Maria Rita Lo Monaco (Fondazione Policlinico Universitario Agostino Gemelli IRCSS, Rome, Italy)
Diego Ricciardi (Fondazione Policlinico Universitario Agostino Gemelli, IRCCS, Rome, Italy)
Anna Rita Bentivoglio (Fondazione Policlinico Universitario Agostino Gemelli IRCCS, Roma, Italy)
Eduardo Palermo (Sapienza University of Rome, Italy)

10:40 Cardiorespiratory monitoring using a mechanical and an optical system
Daniela Lo Presti (Università Campus Bio-Medico di Roma, Italy)
Carlo Massaroni (Università Campus Bio-Medico di Roma, Italy)
Michele Arturo Caponero (ENEA Frascati Research Centre, Italy)
Domenico Formica (Università Campus Bio-Medico di Roma, Italy)
Emiliano Schena (University Campus Bio-Medico of Rome, Italy)

11:00 Few-shot Fall Detection using Shallow Siamese Network
Satyake Bakshi (Carleton University, Canada)
Sreeraman Rajan (Carleton University, Canada)

11:30 - 12:50
RS8: Measurements and Instrumentation for monitoring cardiovascular parameters
Chairs: Paola Saccomandi (Politecnico di Milano, Italy), Sergio Rapuano (University of Sannio, Italy)

11:30 Non-contact Blood Pressure Estimation Using a 300 GHz Continuous Wave Radar and Machine Learning Models
Marie Jung (Fraunhofer Institute for High Frequency Physics and Radar Techniques FHR, Germany)
Michael Caris (Fraunhofer FHR, Germany)
Stephan Stanko (Fraunhofer FHR, Germany)

11:50 Effects of Region of Interest Size on Heart Rate Assessment through Video Magnification
Leen Yassin Kassab (Carleton University, Canada)
Andrew Law (National Research Council, Canada)
Bruce Wallace (AGE-WELL NIH SAM3 & Carleton University, Canada)
Julien Lariviére-Chartier (Bruyère Research Institute, Canada)
Rafik Goubran (Carleton University, Canada)
Frank Knoefel (Bruyere Continuing Care, Canada)

12:10 Measuring Coronary Artery Capillary Resistance with Variable Inflow Conditions
Daniel Goubran (University of British Columbia, Canada)
Samuel Lichtenstein (University of British Columbia, Canada)
Rafik Goubran (Carleton University, Canada)
Julien Lariviére-Chartier (Bruyère Research Institute, Canada)
James Abel (University of British Columbia, Canada)

12:30 Automated, Portable, and Low-Cost System for Home Screening of Peripheral Arterial Disease
Nosratallah Forghani (Azad University-Science and Research Branch, Iran)
Keivan Maghooii (Department Islamic Azad University Science and Research Branch Tehran Iran, Iran)
Nader Jafarian Dabanaloo (Azad University-Science and Research Branch, Iran)
Ali Vasheghani Farahani (University of Tehran, Iran)
Mohamad Forouzanfar (École de Technologie Supérieure, University of Quebec, Canada & SRI International, USA)
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<td>11:30</td>
<td>R511: Advances in biomedical sensors and Instrumentation - B</td>
<td></td>
<td>Nicola Donato (University of Messina, Italy), Rafik Goubran (Carleton University, Canada)</td>
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<td>11:30</td>
<td>Design of Low-Power Highly Accurate CMOS Potentiostat Using the gm/ID Methodology</td>
<td>Yaohua Zhang (Imperial College London, United Kingdom (Great Britain) Daryl Ma (Imperial College London, United Kingdom (Great Britain) Sandro Carrara (EPFL, Switzerland) Pantelis Georgiou (Imperial College London, United Kingdom (Great Britain)</td>
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<tr>
<td>11:50</td>
<td>Hydrogen chemoresistive sensor for the analysis of gut health</td>
<td>Alessio Gullino (Politecnico di Torino, Italy) Sabrina Grassini (Politecnico di Torino, Italy) Giovanni Gugliandolo (University of Messina, Italy) Kaveh Moulaee (University of Messina, Italy) Nicola Donato (University of Messina, Italy) Marco Parvis (Politecnico di Torino, Italy) Luca Lombardo (Politecnico di Torino, Italy)</td>
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<tr>
<td>12:10</td>
<td>Aptamer based Lateral Flow Assays for Rapid and Sensitive Detection of CKD marker Cystatin C</td>
<td>Satheesh Natarajan (Healthcare Technology Innovation Centre (HTIC), India) Malay Ilesh Shah (Healthcare Technology Innovation Centre (HTIC) &amp; Indian Institute of Technology (IIT) Madras, India) Maria Derosa (Carleton University, Canada, Canada) Srinivasa Karthik (Healthcare Technology Innovation Centre, India) Jayaraj Joseph (Indian Institute of Technology Madras, India)</td>
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<td>12:30</td>
<td>Pressure sensors used as bioimpedance plantar electrodes: a feasibility study</td>
<td>Isabel Morales (Universidad de la República &amp; Núcleo de Ingeniería Biomédica, Uruguay) Rafael González-Landaeta (Universidad Autónoma de Ciudad Juárez, Uruguay) Franco Simini (Universidad de la República, Uruguay)</td>
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<tr>
<td>11:30</td>
<td>SS2- II: Wearable sensors in the era of remote and continuous monitoring of physiological and physical parameters</td>
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<td>Pasquale Arpaia (University of Naples Federico II, Italy), Carlo Massaroni (Università Campus Bio-Medico di Roma, Italy)</td>
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<td>11:30</td>
<td>Ensemble Empirical Mode Decomposition for Efficient R-Peak Detection in Electrocardiograms Acquired by Portable Sensors During Sport Activity</td>
<td>Sofia Romagnoli (Università Politecnica delle Marche, Italy) Iliara Marcantonii (Università Politecnica delle Marche, Italy) Katyana Campanella (Università Politecnica delle Marche, Italy) Agnese Sbrollini (Università Politecnica delle Marche, Italy) Micaela Moretti (Università Politecnica delle Marche, Italy) Laura Burattini (Università Politecnica delle Marche, Italy)</td>
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<td>11:50</td>
<td>Autonomic Nervous System Assessment During Physical Rehabilitation Serious Game</td>
<td>Mariana Catela Jacob Rodrigues (ISCTE-IUL &amp; Instituto de Telecomunicações, Portugal) Octavian Adrian Postolache (Instituto de Telecomunicações, Lisboa/IT &amp; Instituto Universitario de Lisboa, ISCTE-IUL, Portugal) Francisco Cercas (ISCTE-IUL &amp; Instituto de Telecomunicações, Portugal)</td>
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<td>12:10</td>
<td>ML algorithms for the assessment of prescribed physical exercises</td>
<td>Sara García de Villa (University of Alcalá, Spain) Andrea Martínez Parra (University of Alcalá, Spain) Ana Jiménez Martín (University of Alcalá, Spain) J. Jesús García (University of Alcalá, Spain) David Casillas-Perez (Rey Juan Carlos University, Spain)</td>
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<tr>
<td>12:30</td>
<td>Impact of reconstruction algorithms on dynamic ECG compressed sensing</td>
<td>Pasquale Daponte (University of Sannio, Italy) Luca De Vito (University of Sannio, Italy) Enrico Picariello (University of Sannio, Italy) Sergio Rapuano (University of Sannio, Italy)</td>
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<td>13:00</td>
<td>Break</td>
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### 14:00-15:20

#### RS12: Advances in biomedical sensors and Instrumentation – C

**Chairs:** Sabrina Grassini (Politecnico di Torino, Italy), Marco Tarabini (Politecnico di Milano, Italy)

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<tr>
<th>Time</th>
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<th>Authors</th>
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<tr>
<td>14:00</td>
<td>Preliminary Study of a Flexible Printed Multi-Sensing Platform for Electromyography and Lactate Measuring during Rehabilitation</td>
<td>Sarah Tonello (University of Padova, Italy), Giada Giorgi (University of Padova, Italy), Claudio Narduzzi (Università di Padova, Italy), Tiziano Fapanni (University of Brescia, Italy), Edoardo Cantù (University of Brescia, Italy), Mauro Serpelloni (University of Brescia, Italy), Emilio Sardini (University of Brescia, Italy), Sandro Carrara (EPFL, Switzerland)</td>
</tr>
<tr>
<td>14:20</td>
<td>Electric field distribution analysis for the design of an electrode system in a 3D neuromuscular junction microfluidic device</td>
<td>Flavia Forconi (Sapienza Università di Roma, Italy), Ludovica Apa (Sapienza, University of Rome, Italy), Livio D’Alvia (Sapienza University of Rome, Italy), Marianna Cosentino (Sapienza, University of Rome, Italy), Emanuele Rizzuto (Sapienza University of Rome, Italy), Zaccaria Del Prete (SAPIENZA University of Rome, Italy)</td>
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<tr>
<td>14:40</td>
<td>Design and response analysis of a circular patch antenna for adherent cell culture detection</td>
<td>Serena Carraro (Università di Roma Sapienza, Italy), Livio D’Alvia (Sapienza University of Rome, Italy), Francesca Cerminara (Sapienza University of Rome, Italy), Zaccaria Del Prete (SAPIENZA University of Rome, Italy), Emanuele Rizzuto (Sapienza University of Rome, Italy)</td>
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<tr>
<td>15:00</td>
<td>Enhancing the Fluorescence and Cycle Threshold of qPCR Devices Through Excitation Time Point Adjustment</td>
<td>Hsin-Yi Tsai (Taiwan Instrument Research Institute, National Applied Research Laboratories, Taiwan), Liang-Chieh Chao (Taiwan Instrument Research Institute, National Applied Research Laboratories, Taiwan), Cheng-Ru Li (Taiwan Instrument Research Institute, National Applied Research Laboratories, Taiwan), Kuo-Cheng Huang (Instrument Technology Research Center, Taiwan), Yu-Hsuan Lin (Taiwan Instrument Research Institute, National Applied Research Laboratories, Taiwan), Dar-Bin Shieh (National Cheng Kung University &amp; NCKU Hospital, Taiwan)</td>
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#### 14:00-15:20

#### SS2-III: Wearable sensors in the era of remote and continuous monitoring of physiological and physical parameters

**Chairs:** Luca De Vito (University of Sannio, Italy), Octavian Adrian Postolache (Instituto de Telecomunicações, Lisboa/IT & Instituto Universitário de Lisboa, ISCTE-IUL, Portugal)

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<tr>
<th>Time</th>
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<th>Authors</th>
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<tr>
<td>14:00</td>
<td>Wirelessly Powered Device for Optical Measurement of Respiration Rate</td>
<td>Yu-Chieh Chen (Taiwan Instrument Research Institute, NARL, Taiwan), James Tsan (Ezinstrument Co., Ltd., Taiwan), Wen-Yen Lin (Chang Gung University, Taiwan)</td>
</tr>
<tr>
<td>14:20</td>
<td>Smartwatches selection: market analysis and metrological characterization on the measurement of number of steps</td>
<td>Sara Casaccia (Università Politecnica delle Marche, Italy), Gian Marco Revel (Università Politecnica delle Marche, Italy), Giacomo Cucchieri (IRCCS INRCA, Italy), Lorenza Scalise (Università Politecnica delle Marche, Italy)</td>
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<tr>
<td>14:40</td>
<td>Analysis of Galvanic Skin Response to Acoustic Stimuli by Wearable Devices</td>
<td>Grazia Iadarola (University of Sannio, Italy), Angelica Poli (Università Politecnica delle Marche, Italy), Susanna Spinsante (Università Politecnica delle Marche, Italy)</td>
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<tr>
<td>15:00</td>
<td>Metrological characterization and signal processing of a wearable sensor for the measurement of heart rate variability</td>
<td>Nicole Morresi (Università Politecnica delle Marche, Italy), Sara Casaccia (Università Politecnica delle Marche, Italy), Gian Marco Revel (Università Politecnica delle Marche, Italy)</td>
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</table>
15:30 - 16:50
RS24: Measurement systems for cognitive and behavioural monitoring
Chairs: Anna Maria Lucia Lanzolla (Polytechnic of Bari, Italy), Bruce Wallace (AGE-WELL NIH SAM3 & Carleton University, Canada)

15:30 The use of cognitive training, combined with tDCS, for craving reduction and inhibitory control improvement in cocaine dependence: a case study
Natale Salvatore Bonfiglio (University of Bologna, Italy)
Roberta Renati (University of Pavia, Italy)
Dilucia Kristel (University of Pavia, Italy)
Dolores Rollo (University of Parma, Italy)
Maria Pietronilla Penna (University of Cagliari, Italy)

15:50 PsySuite, an Android App for behavioural tests in the temporal domain
Alberto Inuggi (Istituto Italiano di Tecnologia, Italy)
Alessia Tonelli (Istituto Italiano di Tecnologia, Italy)
Monica Gori (Italian Institute of Technology, Italy)

16:10 Development of a multi-transduction system for breath analysis in neurodegenerative diseases
Giovanni Gugliandolo (University of Messina, Italy)
Giuseppe Campobello (University of Messina, Italy)
Zlatica Marinković (University of Nis, Serbia)
Giovanni Crupi (University of Messina, Italy)
Giovanni Neri (University of Messina, Italy)
Nicola Donato (University of Messina, Italy)

15:30 - 16:50
SS3: From implantable devices to Smart Dust: solutions and challenges for a micro and nano scale precision and personalized medicine
Chairs: Paolo Motto Ros (Politecnico di Torino, Italy), Danilo Demarchi (Politecnico di Torino, Italy)

15:30 A 20 Mbps, 433 MHz RF ASK Transmitter to Inductively Power a Distributed Network of Miniaturised Neural Implants
Gian Luca Barbruni (EPFL, Switzerland)
Fabio Asti (EPFL, Switzerland)
Paolo Motto Ros (Politecnico di Torino, Italy)
Diego Ghezzi (EPFL, Switzerland)
Danilo Demarchi (Politecnico di Torino, Italy)
Sandro Carrara (EPFL, Switzerland)

15:50 A Real-Time DSP-Based Biohybrid MEA System for Seizure Detection In Vitro
Teresa Serrano-Gotarredona (National Microelectronics Center, CNM-CSIC, Spain)
Bernabe Linares-Barranco (Instituto de Microelectronica de Sevilla, Spain)
Javad Ahmadi-farsani (Instituto de Microelectrónica de Sevilla (IMSE-CNM), Spain)
Gabriella Panuccio (IIT, Italy)
Davide Caron (IIT, Italy)

16:10 A 300mV-Supply, 144nW-Power, 0.03mm2-Area, 0.2-PEF Digital-Based Biomedical Signal Amplifier in 180nm CMOS
Pedro Toledo (Politecnico di Torino, Italy)
Hamilton Klimach (UFRGS, Brazil)
Sergio Bampi (Federal University of Rio Grande do Sul & Microelectronics Group at UFRGS, Brazil)
Paolo S. Crovetti (Politecnico di Torino, Italy)

16:30 Capacitive Link for Data Communication Between Free Floating mm-sized Brain Implants
Xiao Sha (Stonybrook University, USA)
Yasha Karimi (Stony Brook University, USA)
Milutin Stanacevic (SUNY Stony Brook, USA)
Puyang Zheng (Stony Brook University, USA)

17:00 - 18:30
Tutorial
“A Gentle Introduction to DOE”
Chairs: Lorenzo Scalise (Università Politecnica delle Marche, Ancona, Italy)
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<tr>
<td>8:30-10:00</td>
<td>Tutorial</td>
<td><strong>“Charge Measuring Electronics in Medical Applications”</strong></td>
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<td>Chairs: Sabrina Grassini (Politecnico di Torino, Italy)</td>
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<td>10:00-11:20</td>
<td>RS 14: Processing of biomedical signals - A</td>
<td>Chairs: Paolo Sommella (University of Salerno, Italy), Micaela Morettini (Università Politecnica delle Marche, Italy)</td>
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</table>
| 10:00        | DeepHealth: A Secure Framework to Manage Health Certificates Through Medical IoT, Blockchain and Deep Learning | Gazi Abdur Rakib (Bangladesh University of Engineering and Technology, Bangladesh)  
Mohammad Saiful Islam (University of London, Saudi Arabia)  
Md Abdur Rahman (University of Prince Mugrin, Saudi Arabia)  
Abdullah Maruf Syed (NGM Lab, Bangladesh)  
M. Shamim Hossain (King Saud University & University of Ottawa, Saudi Arabia)  
Nabil Alrajeh (King Saud University, Saudi Arabia)  
Abdulmotaleb El Saddik (University of Ottawa, Canada) |
| 10:20        | Analysis of cough sound measurements including COVID-19 positive cases: A machine learning characterization | Julio Valdes (Researcher at the National Research Council of Canada, Canada)  
Pengcheng Xi (National Research Council Canada, Canada)  
Madison Cohen-McFarlane (Carleton University, Canada)  
Bruce Wallace (AGE-WELL NIH SAM3 & Carleton University, Canada)  
Rafik Goubran (Carleton University, Canada)  
Frank Knoefel (Bruyere Continuing Care, Canada) |
| 10:40        | Distinguishing Stroke patients with and without Unilateral Spatial Neglect by means of Clinical Features: a Tree-based Machine Learning Approach | Leandro Donisi (University of Naples Federico II, Italy)  
Pasquale Moretta (ICS Maugeri SPA SB, Italy)  
Armando Cocci(Unciversity of Naples Federico II, Italy)  
Federica Amirano (University of Naples Federico II, Italy)  
Arcangelo Biancardi (S. Maugeri Foundation, Italy)  
Giovanni D’Addio (S. Maugeri Foundation, Rehabilitation Institute of Telese, Italy) |
| 11:00        | Location Independence in Machine Learning Classification of Sitting-Down and Standing-Up Actions using Wi-Fi Sensors | Itaf O. Joudeh (Carleton University, Canada)  
Ana-Maria Cretu (University of Quebec Outaouais, Canada)  
Bruce Wallace (AGE-WELL NIH SAM3 & Carleton University, Canada)  
Rafik Goubran (Carleton University, Canada)  
Michel Allegue (Airial, Canada)  
Frank Knoefel (Bruyere Continuing Care, Canada) |
| 10:00-11:20  | RS18: Advances in biomedical sensors and Instrumentation - D                  | Chairs: Emiliano Schena (University Campus Bio-Medico of Rome, Italy), Juri Taborni (University of Tuscia, Viterbo, Italy) |
| 10:00        | Unobtrusively Detecting Apnea and Hypopnea Events via a Hydraulic Bed Sensor | David Heise (Lincoln University, USA)  
Ruhan Yi (University of Missouri, Columbia, USA)  
Laurel A Despins (University of Missouri, Columbia, USA) |
| 10:20        | Contactless Continuous Monitoring of Respiration                             | Lorenzo Scalise (Università Politecnica delle Marche, Italy)  
Mir farooq Ali (Marche Polytechnic University, Italy)  
Luca Antognoli (Università Politecnica delle Marche, Italy) |
| 10:40        | Toward Continuous Estimation of Cardiorespiratory Parameters in Oscillometry: A Simulation Study | Mohammad Hasan Azad (K. N. Toosi University of Technology, Iran)  
Ramin Farzam (K. N. Toosi University of Technology, Iran)  
Hamidreza Sadeghi (K. N. Toosi University of Technology, Iran);  
Nikta Zarf Yusseffian (Université de Sherbrooke, Canada)  
Mohamad Forouzanfar (École de Technologie Supérieure, University of Quebec, Canada & SRI International, USA) |
| 11:00        | Stability Analysis for Howland Current Source for Bioimpedance Measurement   | Hanen Nouri (Technische Universität Chemnitz & Fakultät für Elektrotechnik und Informationstechnik, Germany)  
Dhouha Bouchaala (Technische Universität Chemnitz, Germany & Digital Research Center of Sfax, Tunisia)  
Olfa Kanoun (Chemnitz University of Technology, Germany) |
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<tr>
<th>Time</th>
<th>Session/Topic</th>
<th>Chairs</th>
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<tbody>
<tr>
<td>10:00-11:20</td>
<td><strong>SS1- I: Advanced measurement techniques and methodologies for the quantitative assessment of gait function in health and pathology</strong></td>
<td>Valentina Agostini (Politecnico di Torino, Italy), Francesco Di Nardo (Università Politecnica delle Marche, Italy)</td>
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<tr>
<td>10:00</td>
<td>Analysis of Test-Retest Repeatability of Gait Analysis Parameters in Hereditary Spastic Paraplegia</td>
<td>Armando Coccia (University of Naples, Italy), Federica Amitrano (University of Naples, Italy), Pietro Baiti (Maugeri SPA SB, Italy), Leandro Donisi (University of Naples, Italy), Arcangelo Biancardi (Maugeri Foundation, Italy), Giovanni D’Addio (Maugeri Foundation, Rehabilitation Institute of Telese, Italy)</td>
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<tr>
<td>10:20</td>
<td>Influence of Gait Cycle Normalization on Principal Activations</td>
<td>Gregorio Dotti (Politecnico di Torino, Italy), Marco Ghislieri (Politecnico di Torino, Italy), Samanta Rosati (Politecnico di Torino, Italy), Valentina Agostini (Politecnico di Torino, Italy), Marco Knaffitz (Politecnico di Torino, Italy), Gabriella Balestra (Politecnico di Torino, Italy)</td>
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<tr>
<td>10:40</td>
<td>Effect of Deep Brain Stimulation Frequency on Gait Symmetry, Smoothness and Variability using IMU</td>
<td>Elisa Panero (Politecnico di Torino, Italy), Elisa Digo (Politecnico di Torino, Italy), Ugo Dimanico (Università degli Studi di Torino, Italy), Carlo Alberto Artusi (Università degli Studi di Torino, Italy), Maurizio Zibetti (Università degli Studi di Torino, Italy), Laura Gastaldi (Politecnico di Torino, Italy)</td>
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<td>11:00</td>
<td>Gait Parameters of Elderly Subjects in Single-task and Dual-task with three different MIMU set-ups</td>
<td>Elisa Digo (Politecnico di Torino, Italy), Elisa Panero (Politecnico di Torino, Italy), Valentina Agostini (Politecnico di Torino, Italy), Laura Gastaldi (Politecnico di Torino, Italy)</td>
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<td>11:30-12:50</td>
<td><strong>RS15: Processing of biomedical signals - B</strong></td>
<td>Aime’ Lay-Ekuakille (University of Salento, Italy)</td>
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<tr>
<td>11:30</td>
<td>Identifying High Risk of Atherosclerosis Using Deep Learning and Ensemble Learning</td>
<td>Hedieh Hashem Olhosseiny (University of Ottawa, Canada), Mohammadsalar Mirzaloo (University of Ottawa, Canada), Miodrag Bolic (University of Ottawa, Canada), Hilmi R Dajani (University of Ottawa, Canada), Voicu Groza (University of Ottawa, Canada), Masayoshi Yoshida (University of Ottawa, Canada)</td>
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<td>11:50</td>
<td>Detection of Sleep Apnea from Single-Lead ECG: Comparison of Deep Learning Algorithms</td>
<td>Mahsa Bahrami (K. N. Toosi University of Technology, Iran), Mohamad Forouzanfar (École de Technologie Supérieure, University of Quebec, Canada &amp; SRI International, USA)</td>
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<td>12:10</td>
<td>Biological Data Classification via Faster MAXimum Feasible Subsystem Algorithm</td>
<td>Fereshteh Fakhar Firouzeh (Carleton University, Canada), John Chinneck (Carleton University, Canada), Sreeraman Rajan (Carleton University, Canada)</td>
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<td>12:30</td>
<td>Classification-based screening of Parkinson’s disease patients through voice signal</td>
<td>Fulvio Cordella (Università La Sapienza &amp; Technoscience, Italy), Alessandra Paffi (Sapienza University of Rome, Italy), Antonio Pallotti (University of Rome Tor Vergata &amp; Technoscience, Italy)</td>
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</table>
11:30-12:50
RS19: Physiological measurements
Chairs: Emma Paola Angelini (Politecnico di Torino, Italy), Voicu Groza (University of Ottawa, Canada)

11:30 Modulated ECG: Utilization of the Time-Variant Coupling in Capacitive ECG
Durmus Umutcan Uguz (RWTH Aachen University, Germany)
Steffen Leonhardt (RWTH Aachen, Germany)
Christoph Hoog Antink (RWTH Aachen University & Chair for Medical Information Technology, Germany)

11:50 Virtual Reality Archery to quantify the development of Head-Trunk Coordination, Visuomotor transformation And Egocentric Spatial Representation
Davide Esposito (Università di Genova & Istituto Italiano di Tecnologia, Italy)
Alice Bollini (Istituto Italiano di Tecnologia, Italy)
Monica Gori (Italian Institute of Technology, Italy)

12:10 The capabilities of bioelectrical impedance body composition monitors in determining metabolic parameters during body shaping
Natalia Igorevna Khramtssova (E. A. Vagner Perm State Medical University, Russia)
Sergei Aleksandrovich Plaksin (E. A. Vagner Perm State Medical University, Russia)
Danil Ponomarev (E. A. Vagner Perm State Medical University, Russia)
Artem Sotskov (E. A. Vagner Perm State Medical University, Russia)

12:30 Optimization of Blood Microfluidic Co-Flow Devices for Dual Measurement
Amit Nayak (University of Ottawa, Canada)
Curtis Armstrong (University of Ottawa, Canada)
Catherine Mavriplis (University of Ottawa, Canada)
Marianne Fenech (University of Ottawa, Canada)

11:30-12:50
SS1- II: Advanced measurement techniques and methodologies for the quantitative assessment of gait function in health and pathology
Chairs: Valentina Agostini (Politecnico di Torino, Italy), Francesco Di Nardo (Università Politecnica delle Marche, Italy)

11:30 Gait Analysis using Wearable E-Textile Sock: an Experimental Study of Test-Retest Reliability
Federica Amitrano (University of Naples Federico II, Italy)
Armando Coccia (University of Naples Federico II, Italy)
Leandro Donisi (University of Naples Federico II, Italy)
Gaetano Pagano (ICS Maugeri SB of Bari, Italy)
Giuseppe Cesarelli (University of Naples Federico II, Italy)
Giovanni D'Addio (S. Maugeri Foundation, Rehabilitation Institute of Telese, Italy)

Rachele Rossanigo (University of Sassari, Italy)
Marco Caruso (Politecnico di Torino, Italy)
Francesca Salis (University of Sassari, Italy)
Stefano Bertuletti (University of Sassari, Italy)
Ugo Della Croce (University of Sassari, Italy)
Andrea Cereatti (Politecnico di Torino, Italy)

12:10 Classification-Based Screening of Phlebopathic Patients using Smart Socks
Emanuele D'Angelantonio (Università degli Studi di Roma Tre, Italy)
Leandro Lucangeli (Università degli Studi di Roma "Foro Italico" & Technoscience - Parco Scientifico e Tecnologico Pontino, Italy)
Valentina Camomilla (University of Rome Foro Italico, Italy)
Federico Mari (University of Rome "Foro Italico", Italy)
Guido Mascia (University of Rome "Foro Italico", Italy)
Antonio Pallotti (University of Rome Tor Vergata & Technoscience, Italy)

12:30 PARKIBIP Feedback Wearable Rehabilitation Device: Market Analysis and Enhancements
Valentina B. Pasker (University Pompeu Fabra, Spain)
Carlos Huerta (Universidad de la República, Uruguay)
Samuel Sainz (Universidad de la República, Uruguay)
Dario Santos (Universidad de la República, Uruguay)
Franco Simini (Universidad de la República, Uruguay)

13:00-14:00
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<td>14:00</td>
<td>Ensembling CNNs for dermoscopic analysis of suspicious skin lesions</td>
<td>Yali Nie (Mid Sweden University, Sweden)</td>
<td>Paolo Sommella (University of Salerno, Italy)</td>
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<td>Marco Carratù (University of Salerno, Italy)</td>
<td>Sara Cacciapuoti (University Federico II of Naples, Italy)</td>
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<td>Giuseppe Di Leo (University of Salerno, Italy)</td>
<td>Jan Lundgren (Mid Sweden University, Sweden)</td>
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<td>Gabriella Fabbrocini (University Federico II of Naples, Italy)</td>
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<td>14:20</td>
<td>Application of Hybrid Network of UNet and Feature Pyramid Network in Spine Segmentation</td>
<td>Xingxing Liu (University of Iowa, USA)</td>
<td>Wenxiang Deng (University of Iowa, USA)</td>
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<td>Yang Liu (103 South Capitol Street &amp; University of Iowa, USA)</td>
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<td>14:40</td>
<td>Deep Convolutional Feature-Based Fluorescence-to-Color Image Registration</td>
<td>Xingxing Liu (University of Iowa, USA)</td>
<td>Tri Quang (The University of Iowa, USA)</td>
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<td>Wenxiang Deng (University of Iowa, USA)</td>
<td>Yang Liu (103 South Capitol Street &amp; University of Iowa, USA)</td>
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<td>15:00</td>
<td>Densely Connected Convolutional Networks (DenseNet) for Diagnosing Coronavirus Disease (COVID-19) from Chest X-ray Imaging</td>
<td>Hamed Tabrizchi (John von Neumann Faculty of Informatics Obuda University, Hungary)</td>
<td>Zoltan Vamossy (Obuda University, Hungary)</td>
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<td>Annamária R. Várkonyi-Kóczy (Óbuda University, Hungary)</td>
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<td>14:00</td>
<td>BLE-based approach for detecting daily routine changes</td>
<td>Ana Jiménez Martín (University of Alcalá, Spain)</td>
<td>Ismael Miranda David Gualda (King Juan Carlos University, Spain)</td>
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<td>Sara García de Villa (University of Alcalá, Spain)</td>
<td>Sergio Lluva Plaza (University of Alcalá, Spain)</td>
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<td>J. Jesús García (University of Alcalá, Spain)</td>
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<td>14:20</td>
<td>Efficient Compressive Sensing of Biomedical Signals Using A Permuted Kronecker-based Sparse Measurement Matrix</td>
<td>Parichehreh Firoozi (Carleton University, Canada)</td>
<td>Sreeraman Rajan (Carleton University, Canada)</td>
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<td>Ioannis Lambadaris (Carleton University, Canada)</td>
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<td>14:40</td>
<td>Comparison of OpenPose and HyperPose artificial intelligence models for analysis of hand-held smartphone videos</td>
<td>Frederick Zhang (University of Ottawa, Canada)</td>
<td>Pascale Juneau (University of Ottawa, Canada)</td>
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<td>Connor McGuirk (University of Ottawa, Canada)</td>
<td>Albert Tu (University of Ottawa, Canada)</td>
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<td>Kevin Cheung (University of Ottawa, Canada)</td>
<td>Natalie Baddour (University of Ottawa, Canada)</td>
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<td>Edward Lemaire (University of Ottawa, Canada)</td>
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<td>15:00</td>
<td>Automatic processing protocol to evaluate the impact of functional network damage and reorganization on cognitive functions after stroke</td>
<td>Lenka Svobodová (Czech Technical University in Prague, Czech Republic)</td>
<td>Radek Janca (Czech Technical University in Prague &amp; Faculty of Electrical Engineering, Czech Republic)</td>
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<td>Time</td>
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<td>14:00-15:20</td>
<td>SS1-III: Advanced measurement techniques and methodologies for the quantitative assessment of gait function in health and pathology</td>
<td>Chairs: Valentina Agostini (Politecnico di Torino, Italy), Francesco Di Nardo (Università Politecnica delle Marche, Italy)</td>
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<td>14:00</td>
<td>Prediction of stride duration by neural-network interpretation of surface EMG signals</td>
<td>Francesco Di Nardo (Università Politecnica delle Marche, Italy)</td>
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<td>Christian Morbidoni (Università degli Studi G. D'Annunzio, Italy)</td>
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<td>Alessandro Cucchiarelli (Politechnic University of Marche, Italy)</td>
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<td>Sandro Fioretti (Università Politecnica delle Marche, Italy)</td>
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<td>14:20</td>
<td>Characterization of EMG time-frequency content during Parkinson walking: a pilot study</td>
<td>Marco Romanato (University of Padova, Italy)</td>
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<td>Annachiara Strazza (Università Politecnica delle Marche, Italy)</td>
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<td>Weronica Piatkowska (Università degli Studi di Padova, Italy)</td>
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<td>Daniele Volpe (Villa Margherita, S. Stefano, Italy)</td>
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<td>Zimi Sawacha (Università degli Studi di Padova, Italy)</td>
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<td>Francesco Di Nardo (Università Politecnica delle Marche, Italy)</td>
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<td>14:00-15:20</td>
<td>SS4-I: The measurement and assessment of well-being during the Covid-19 pandemic: Implications in neurosciences, psychology and psychiatry</td>
<td>Chairs: Mirian Agus (University of Cagliari, Italy), Pier Marconi (Sapienza - University of Rome &amp; Artemis Neurosciences StP, Italy), Eraldo Francesco Nicotra (University of Cagliari, Italy)</td>
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<td>14:40</td>
<td>Data-driven Development of Digital Health Applications on the Example of Dementia Screening</td>
<td>Markus Schinle (FZI Research Center for Information Technology, Germany)</td>
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<td>Christina Erler (FZI Research Center for Information Technology, Germany)</td>
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<td>Wilhelm Stark (Karlsruhe Institute of Technology, Germany)</td>
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<td>15:00</td>
<td>Web-Based Monitoring of the Psychological Distress facing Covid-19 in relation to Quality of Life and Social Adjustment in young adults</td>
<td>Pier Marconi (Sapienza - University of Rome &amp; Artemis Neurosciences StP, Italy)</td>
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<td>Mirian Agus (University of Cagliari, Italy)</td>
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<td>Maria Lidia Mascia (University of Cagliari, Italy)</td>
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<td>Rosamaria Scognamiglio (Artemis Neurosciences StP, Italy)</td>
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<td>Pierluca Bandinelli (P.O. San Filippo Neri, SPDC Rome, Italy)</td>
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<td>Maria Pietronilla Penna (University of Cagliari, Italy)</td>
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<td>15:30-16:50</td>
<td>RS17: Image processing - B</td>
<td>Chairs: María Eugenia Caligiuri (University Magna Graecia of Catanzaro, Italy), Octavian Adrian Postolache (Instituto de Telecomunicações, Lisboa/IT &amp; Instituto Universitário de Lisboa, ISCTE-IUL, Portugal)</td>
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<td>15:30</td>
<td>Single-pulse measurement electronics for accurate dosimetry in X-ray radiation therapy</td>
<td>Sara Pettinato (Università degli Studi Niccolò Cusano, Italy)</td>
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<td>Riccardo Olivieri (Azienda Ospedaliera &quot;San Giovanni - Addolorata&quot;, Italy)</td>
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<td>Stefano Salvatori (Università degli Studi Niccolò Cusano, Italy)</td>
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<td>15:50</td>
<td>Intraoperative Optical Imaging with Distance-Aware RGB-Fluorescence Image Registration</td>
<td>Maziyar Askari (University of Iowa, USA)</td>
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<td>Wei Chen (Cleveland Clinic, USA)</td>
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<td>Francis Papay (Cleveland Clinic, USA)</td>
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<td>Yang Liu (103 South Capitol Street &amp; University of Iowa, USA)</td>
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<td>16:10</td>
<td>Image Quality Assessment for Endoscopy Applications</td>
<td>Nishitha R (IIT Madras, India)</td>
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<td>Shubham Sharma (Healthcare Technology Innovation Center, IIT Madras, India)</td>
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<td>Ajay Gurrula (IIT Madras, India)</td>
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<td>Jayaraj Joseph (Indian Institute of Technology Madras, India)</td>
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<td>Mohanasankar Sivaprasakam (IIT Madras, India)</td>
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| 15:30-16:50 | **RS21: Mechanical measurement and Instrumentation for Biomedical applications**<br><br>**Chairs:** Mohanasankar Sivaprakasam (IIT Madras, India), Bruce Wallace (AGE-WELL NIH SAM3 & Carleton University, Canada)<br><br>**15:30 Dynamic Shear and Normal Forces on Patient Skin in Sling Lift Transfers**<br>Steven Cramp (Carleton University, Canada)<br>Bruce Wallace (AGE-WELL NIH SAM3 & Carleton University, Canada)<br><br>**15:50 Characterizing On-Road Vibrations in Ontario's Neonatal Patient Transport**<br>Fadwa Darwaish (Carleton University, Canada)<br>Stephanie Redpath (Children's Hospital of Eastern Ontario, Canada)<br>Kim Greenwood (Children's Hospital of Eastern Ontario, Canada)<br>Cheryl Aubertin (Children's Hospital of Eastern Ontario, Canada)<br>Andrew AM Ibe (Children's Hospital of Eastern Ontario & Carleton University, Canada)<br>Adrian D.C. Chan (Carleton University, Canada)<br>James R Green (Carleton University, Canada)<br>Robert Langlois (Carleton University, Canada)<br><br>**16:10 Development of a device to impose mediolateral whole-body vibration while walking**<br>Martín Grigera Naón (Politecnico di Milano, Italy)<br>Stefano Marelli (Politecnico di Milano, Italy)<br>Alex P. Moorhead (Politecnico di Milano, Italy)<br>Bortolino Saggin (Politecnico di Milano, Italy)<br>Giovanni Moschioni (Politecnico di Milano, Italy)<br>Marco Tarabini (Politecnico di Milano, Italy)<br><br>**15:30-16:50**<br>**SS4- II: The measurement and assessment of well-being during the Covid-19 pandemic: Implications in neurosciences, psychology and psychiatry**<br><br>**Chairs:** Giorgio Marchese (National Research Council, Italy), Maria Pietronilla Penna (University of Cagliari, Italy)<br><br>**15:30 The use of cognitive training with tDCS for the reduction of impulsiveness and improvement of executive functions: a case study**<br>Natale Salvatore Bonfiglio (University of Bologna, Italy)<br>Roberta Renati (University of Pavia, Italy)<br>Patrone Ludovica (University of Pavia, Italy)<br>Dolores Rollo (University of Parma, Italy)<br>Maria Pietronilla Penna (University of Cagliari, Italy)<br><br>**15:50 The use of cognitive training and tDCS for the treatment of an high potential subject: a case study**<br>Roberta Renati (University of Pavia, Italy)<br>Natale Salvatore Bonfiglio (University of Bologna, Italy)<br>Patrone Ludovica (University of Pavia, Italy)<br>Dolores Rollo (University of Parma, Italy)<br>Maria Pietronilla Penna (University of Cagliari, Italy)<br><br>**16:10 Pattern of errors in Raven's Colored Progressive Matrices and their use in the clinical assessment of intelligence**<br>Donatella Petretto (University of Cagliari, Italy)<br>Paola Grassi (University of Cagliari, Italy)<br>Carmelo Masala (University of Cagliari, Italy)<br>Eraldo Francesco Nicotra (University of Cagliari, Italy)<br><br>**16:30 Psychometric scales in clinical psychopharmacology trials: mathematical and statistical evaluations**<br>Eraldo Francesco Nicotra (University of Cagliari, Italy)<br>Daniele Lecca (University of Cagliari, Italy)<br>Giorgio Marchese (National Research Council, Italy)<br><br>**17:00-18:00**<br>Closing Remarks/Awards Ceremony