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WORKSHOP PROGRAM

Tuesday, June 7

SESSION 1.1 - Special Session - Non-contact and Vision-based measurements for metal production industry

Room: Room B107 - Povo Scientific Campus

Chair: Marco Tarabini, *Politecnico di Milano, Italy*

1 Automated Vision Inspection of Critical Steel Components based on Signal Analysis Extracted from Images

Paolo Brambilla, Politecnico di Milano, Italy

Paolo Cattaneo, Growermetal S.p.A., Italy

Andrea Fumagalli, Growermetal S.p.A., Italy

Paolo Chiariotti, Politecnico di Milano, Italy

Marco Tarabini, Politecnico di Milano, Italy

6 Metrology of a Monocular Vision System for Markers Localization and Tracking

Giada Luppino, Politecnico di Milano, Italy

Lisa Bosisio, Politecnico di Milano, Italy

Chiara Conese, Politecnico di Milano, Italy

Davide Maria Fabris, Politecnico di Milano, Italy

Marco Tarabini, Politecnico di Milano, Italy

11 Identification of Aluminothermic Reaction Through Vision System and Flame Recognition

Fabio Conti, Politecnico di Milano, Italy

Yuvan Sathya Ravi, Politecnico di Milano, Italy

Maurizio Colombo, One-Off Solution - Automation Software Services, Italy

Paolo Fasoli, Politecnico di Milano, Italy

Andrea Mazzoleni, One-Off Innovation, Italy

Marco Tarabini, Politecnico di Milano, Italy

17 Surface roughness measurements of turned parts through a vision-based measurement system: uncertainty analysis and performance comparison with state-of-the-art instruments

Alessia Baleani, Università Politecnica delle Marche, Italy

Nicola Paone, Università Politecnica delle Marche, Italy

Jona Gladines, University of Antwerp, Belgium

Steve Vanlanduit, University of Antwerp, Belgium

23 Design of a scanning system for the identification of beam profile of immersion ultrasonic probes

Carol Sergenti, Politecnico di Milano, University of Pavia, IMG Utrasuoni SRL, Italy

Hermes Giberti, University of Pavia, Italy

Marco Tarabini, Politecnico di Milano, Italy

Francesco Balatti, IMG Utrasuoni SRL, Italy

Emanuele Gaddi, IMG Utrasuoni SRL, Italy

Massimo Carminati, IMG Utrasuoni SRL, Italy

SESSION 1.2 - Special Session - User-Driven approaches to the design of inclusive and Gender-Aware innovative measurement and IoT systems

Room: Room B109 - Povo Scientific Campus

Chairs: Sara Coppola, *Institute of Applied Science and Intelligent Systems - CNR, Italy*

Monica La Mura, University of Salerno, Italy

Cristina Ponti, Roma Tre University, Italy

Paola Saccomandi, Politecnico di Milano, Italy

- 28 **The “Great Beauty” of Diversity: Smart Totems to Promote Gender Uniqueness**
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Sara Peretti, University of L'Aquila, Italy
Federica Caruso, University of L'Aquila, Italy
Dajana Cassioli, University of L'Aquila, Italy
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Patrizia Lamberti, University of Salerno, Italy
Monica La Mura, University of Salerno, Italy
Marco De Gregorio, University of Salerno, Italy
Vincenzo Tucci, University of Salerno, Italy
Luigi Egiziano, University of Salerno, Italy
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Danila del Giudice, University of Naples Federico II, Italy
Vincenzo Ferraro, University of Naples Federico II, Italy
Veronica Vespini, Institute of Applied Sciences and Intelligent Systems, CNR, Italy
Simonetta Grilli, Institute of Applied Sciences and Intelligent Systems, CNR, Italy
Pier Luca Maffettone, University of Naples Federico II, Italy
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Stefania Ballone, Teatro alla Scala di Milano, Italy
Omar De Bartolomeo, Gruppo Italiano Danza e Medicina, Italy
Alfredo Cigada, Politecnico di Milano, Italy
Paola Saccomandi, Politecnico di Milano, Italy
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Giuseppe Schettini, 'Roma Tre' University, Italy

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Room: Room B107 - Povo Scientific Campus

Chair: Gloria Cosoli, *Università Politecnica delle Marche, Italy*

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Gloria Cosoli, Università Politecnica delle Marche, Italy
Anna Laura Pisello, Università di Perugia, Italy
Iliaria Pigliautile, Università di Perugia, Italy
Gian Marco Revel, Università Politecnica delle Marche, Italy
Marco Arnesano, Università degli studi di eCampus, Italy
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Simona Del Ferraro, INAIL, Italy
Vincenzo Molinaro, INAIL, Italy
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Paolo Lenzuni, INAIL, Italy
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Nicole Morresi, Università Politecnica delle Marche, Italy
Sara Casaccia, Università Politecnica delle Marche, Italy
Gian Marco Revel, Università Politecnica delle Marche, Italy

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Massimiliano Donati, University of Pisa, Italy
Martina Olivelli, University of Pisa, Italy
Romano Giovannini, Digital Building srl, Italy
Luca Fanucci, University of Pisa, Italy

SESSION 2.2 - Special Session - AI-Enhanced sensing for industrial and medical IoT applications – PART I

Room: Room B109 - Povo Scientific Campus

Chairs: Luca Vollero, *Università Campus Bio-Medico di Roma*
Samuel Oluwarotimi, *Shenzhen Institute of Advanced Technology, China*

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Mojisola Grace Asogbon, Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China
Oluwarotimi Williams Samuel, Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China
Ejay Nsugbe, Nsugbe Research Labs, United Kingdom
Shixiong Chen, Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China
Guanglin Li, Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China

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Mojisola Grace Asogbon, Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China
Olumide Olayinka Obe, Federal University of Technology, Nigeria
Guanglin Li, Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China

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Giordano Pescetelli, Università Campus Bio-Medico di Roma, Italy
Lorenzo Petrosino, Università Campus Bio-Medico di Roma, Italy
Stefano Della Valle, Teleconsys S.p.A., Italy
Giulia Rongao, Teleconsys S.p.A., Italy
Mario Merone, Università Campus Bio-Medico di Roma, Italy
Luca Vollero, Università Campus Bio-Medico di Roma, Italy

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Ejay Nsugbe, Nsugbe Research Labs, United Kingdom
Oluwarotimi Williams Samuel, Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China
Mojisola Grace Asogbon, Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China
Guanglin Li, Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China

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Room: Room B107 - Povo Scientific Campus

Chair: Alessandro Loppini, *Università Campus Bio-Medico di Roma, Italy*

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Giovanni Di Muccio, Università di Roma Tor Vergata, Italy
Cristiano Giordani, Universidad de Antioquia, Colombia
Fabio Cecconi, Istituto Sistemi Complessi - CNR, Italy
Blasco Morozzo della Rocca, Università di Roma Tor Vergata, Italy

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Yuval Cohen, University College London, UK
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Letizia Chiodo, Campus Bio-Medico University, Italy
Alessandro Loppini, Campus Bio-Medico University, Italy
Simonetta Filippi, Campus Bio-Medico University, Italy
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Santiago Hernandez-Gomez, Università degli Studi di Firenze, Italy
Federico Balducci, Istituto Nazionale di Fisica Nucleare, Italy
Paola Cappellaro, Massachusetts Institute of Technology, USA
Antonello Scardicchio, Istituto Nazionale di Fisica Nucleare, Italy
Nicole Fabbri, CNR-INO, LENS
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Giulia Tomagra, University of Torino, Italy
Ettore Bernardi, INRiM, Italy
Ekaterina Moreva, INRiM, Italy
Paolo Traina, INRiM, Italy
Andrea Marcantoni, University of Torino, Italy
Federico Picollo, University of Torino, INFN, Italy
Paolo Olivero, University of Torino, INFN, Italy
Kludia Kvakova, Institute of Organic Chemistry and Biochemistry, Czech Republic
Petr Cigler, Institute of Organic Chemistry and Biochemistry, Czech Republic
Ivo Pietro Degiovanni, INRiM, INFN, Italy
Valentina Carabelli, University of Torino, Italy
Marco Genovese, INRiM, INFN, Italy

SESSION 3.2 - Special Session - AI-Enhanced sensing for industrial and medical IoT applications – PART II

Room: Room B109 - Povo Scientific Campus

Chairs: Luca Vollero, *Università Campus Bio-Medico di Roma*
 Samuel Oluwarotimi, *Shenzhen Institute of Advanced Technology, China*

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Eleonora Nicolai, University of Rome Tor Vergata, Italy
Luca Vollero, Università Campus Bio-Medico di Roma, Italy
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Oluwarotimi Williams Samuel, Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China
Guanglin Li, Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China
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Leandro Lucangeli, University of Rome "Foro Italico", Italy
Valentina Camomilla, University of Rome "Foro Italico", Italy
Antonio Pallotti, "San Raffaele" University of Rome, Italy
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Norhen Abdennadher, STMicroelectronics, Italy

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Randriatsimiovalaza Dimbiniaina Marc, STMicroelectronics - University of Trento, Italy
Davide Denaro, STMicroelectronics, Italy
-

Wednesday, June 8

SESSION 4.1 - Special Session - Measurements for the Electric power industry - PART I

Room: Room B107 - Povo Scientific Campus

Chairs: Erick F. Alves, *Norwegian University of Science and Technology, Norway*

David Macii, *University of Trento, Italy*

Elisabetta Tedeschi, *University of Trento, Italy*

- 155 **An open-hardware implementation for GPS synchronized waveform measurements**

Eduardo Viciano, Zred Comunicaciones y Automatizacion SL, Spain

Alfredo Alcayde, University of Almeria, Spain

Francisco M. Arrabal-Campos, University of Almeria, Spain

Raul Banos, University of Almeria, Spain

Francisco Manzano-Agugliaro, University of Almeria, Spain

Francisco G. Montoya, University of Almeria, Spain

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Francisco G. Montoya, University of Almeria, Spain

Francisco M. Arrabal-Campos, University of Almeria, Spain

Jorge Ventura Gil, University of Almeria, Spain

Alfredo Alcayde, University of Almeria, Spain

Viktor Isanbaev, University of Almeria, Spain

Elisabetta Tedeschi, University of Trento, Italy

Thomas A. Cooke, Electric Power Research Institute, USA

Jason Johns Electric Power Research Institute, USA

Eduardo Viciano, Zred Comunicaciones y Automatizacion SL, Spain

- 167 **The Effects of LED Lamps Emissions on PLC: a Preliminary Study in a Realistic Scenario**

Giovanni Bucci, University of L'Aquila, Italy

Fabrizio Ciancetta, University of L'Aquila, Italy

Andrea Fioravanti, University of L'Aquila, Italy

Edoardo Fiorucci, University of L'Aquila, Italy

Carmine Landi, University of Campania "Luigi Vanvitelli", Italy

Mario Luiso, University of Campania "Luigi Vanvitelli", Italy

Simone Mari, University of L'Aquila, Italy

Andrea Silvestri, University of L'Aquila, Italy

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Room: Room B209 - Povo Scientific Campus

Chair: Daniele Fontanelli, *University of Trento, Italy*

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Marco Piavanini, Politecnico di Milano, Italy

Luca Barbieri, Politecnico di Milano, Italy

Mattia Brambilla, Politecnico di Milano, Italy

Mattia Cerutti, Politecnico di Milano, Italy

Simone Ercoli, Tracking 4 Fun S.r.l., Italy

Andrea Agili, Tracking 4 Fun S.r.l., Italy

Monica Nicoli, Politecnico di Milano, Italy

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Gabriele Bandini, University of Pisa, Italy

Alice Buffi, University of Pisa, Italy

Mirko Marracci, University of Pisa, Italy

Bernardo Tellini, University of Pisa, Italy

Luciano Di Donato, INAIL, Italy

Marco Pirozzi, INAIL, Italy

Laura Tommasini, INAIL, Italy

Alessandra Ferraro, INAIL, Italy

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Farhad Shamsfakhr, University of Trento, Italy

Michele Corrà, TRETEC S.r.l., Italy

Alessandro Ferrari, VNG Ingegneria, Italy

David Macii, University of Trento, Italy

Luigi Palopoli, University of Trento, Italy

Daniele Fontanelli, University of Trento, Italy

SESSION 5.1 - Special Session - Measurements for the Electric power industry - PART II

Room: Room B107 - Povo Scientific Campus

Chairs: Erick F. Alves, *Norwegian University of Science and Technology, Norway*

David Macii, *University of Trento, Italy*

Elisabetta Tedeschi, *University of Trento, Italy*

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Alessandro Torrisi, University of Trento, Italy

Franco Tabarelli, University of Trento, Italy

Davide Brunelli, University of Trento, Italy

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Gabriele Patrizi, University of Florence, Italy

Alessandro Bartolini, University of Florence, Italy

Carlos Iturrino Garcia, University of Florence, Italy

Cristiano Del Rio, University of Florence, Italy

Lorenzo Ciani, University of Florence, Italy

Marcantonio Catelani, University of Florence, Italy

Francesco Grasso, University of Florence, Italy

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Alan Oliveira de Sa, Universidade de Lisboa, Portugal

Lucila Maria de Souza Bento, State University of Rio de Janeiro, Brazil

Mariana Luiza Flavio, Physikalisch-Technische Bundesanstalt, Germany

Marco Pasetti, University of Brescia, Italy

Paolo Ferrari, University of Brescia, Italy

Emiliano Sisinni, University of Brescia, Italy

SESSION 5.2 - Special Session - Tracking and positioning for Industry 4.0 - PART II

Room: Room B209 - Povo Scientific Campus

Chair: Daniele Fontanelli, *University of Trento, Italy*

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Maria Doglioni, University of Trento, Italy

Luca Santoro, University of Trento, Italy

Matteo Nardello, University of Trento, Italy

Daniele Fontanelli, University of Trento, Italy

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Dirk Timmermann, University of Rostock, Germany

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Vittorio Sala, iMAGES s.p.a, Italy
Andrea Mannella, iMAGES s.p.a, Italy

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Room: Room B107 - Povo Scientific Campus

Chairs: *Andrea Prato, INRiM - National Institute of Metrological Research, Italy*
Alessandro Schiavi, INRiM – National Institute of Metrological Research, Italy

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Andrea Prato, INRiM – National Institute of Metrological Research, Italy
Francesca R. Pennecchi, INRiM – National Institute of Metrological Research, Italy
Gianfranco Genta, Politecnico di Torino, Italy
Alessandro Schiavi, INRiM – National Institute of Metrological Research, Italy

229 Calibration of a multicomponent MEMS sensor for vibration monitoring of rolling bearings: broad-band and amplitude traceability up to 20 kHz

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Ada Fort, University of Siena, Italy
Elia Landi, University of Siena, Italy
Marco Mugnaini, University of Siena, Italy
Valerio Vignoli, University of Siena, Italy
Andrea Prato, INRiM – National Institute of Metrological Research, Italy
Fabrizio Mazzoleni, INRiM – National Institute of Metrological Research, Italy
Michele Murgia, Politecnico di Torino, Italy

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Emanuele Parisi, University of Bologna, Italy
Amirhossein Moallemi, University of Bologna, Italy
Francesco Barchi, University of Bologna, Italy
Andrea Bartolini, University of Bologna, Italy
Davide Brunelli, University of Bologna, Italy
Nicola Buratti, University of Bologna, Italy
Andrea Acquaviva, University of Bologna, Italy

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Carlo Trigona, University of Catania, Italy
Tianqi Lu, Technische Universität Chemnitz, Germany
Malak Talbi, Technische Universität Chemnitz, Germany
Salvatore Baglio, University of Catania, Italy
Ammar Al-Hamry, Technische Universität Chemnitz, Germany
Clara Garcia-Martinez, Universidade Federal do Paraná, Brazil
Olfa Kanoun, Technische Universität Chemnitz, Germany

SESSION 6.2 - Special Session - Printed Sensors for Industrial and Medical IoT: Innovation and Challenges

Room: Room B109 - Povo Scientific Campus

Chairs: *Bruno Andò, University of Catania, Italy*
Michela Borghetti, University of Brescia, Italy

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Mauro Serpelloni, University of Brescia, Italy
Emilio Sardini, University of Brescia, Italy
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Giovanni Mariani, University of Tuscia, Italy
Juri Taborri, University of Tuscia, Italy
Ilaria Mileti, University of Niccolò Cusano, Italy
Giacomo Bagordo, University of Tuscia, Italy
Eduardo Palermo, University of Sapienza, Italy
Fabrizio Patanè, University of Niccolò Cusano, Italy
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Salvatore Castorina, University of Catania, Italy
Salvatore Graziani, University of Catania, Italy
Marthala Guru Bhaskar Reddy, University of Catania, Italy
Salvatore Petralia, University of Catania, Italy
Maria Anna Messina, University-Polyclinic of Catania, Italy
Ludovica Maugeri, University-Polyclinic of Catania, Italy
Giovanni Neri, University of Messina, Italy
Angelo Ferlazzo, University of Messina, Italy
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Ileana Armando, University of Brescia, Italy
Michela Borghetti, University of Brescia, Italy
Emilio Sardini, University of Brescia, Italy
Mauro Serpelloni, University of Brescia, Italy

SESSION 7.1 - Special Session - Wearable sensors and devices for unobtrusive human activities and physiological monitoring - PART I

Room: Room B107 - Povo Scientific Campus

Chairs: Carlo Massaroni, *Università Campus Bio-Medico di Roma, Italy*
Emiliano Schena, *Università Campus Bio-Medico di Roma, Italy*

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Carlo Massaroni, Università Campus Bio-Medico di Roma, Italy
Emiliano Schena, Università Campus Bio-Medico di Roma, Italy
Fabrizio Marra, Sapienza University of Rome, Italy
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Serena Minutillo, Sapienza University of Rome, Italy
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Gemma Hornero, Universitat Politècnica de Catalunya, Spain
Oscar Casas, Universitat Politècnica de Catalunya, Spain

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Martina Pulcinelli, Università Campus Bio-Medico of Roma, Italy
Arianna Carnevale, Università Campus Bio-Medico of Roma, Italy
Joshua Di Tocco, Università Campus Bio-Medico of Roma, Italy
Carlo Massaroni, Università Campus Bio-Medico of Roma, Italy
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Umile G Longo, Università Campus Bio-Medico of Roma, Italy
Vincenzo Denaro, Università Campus Bio-Medico of Roma, Italy
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Daniela Lo Presti, Università Campus Bio-Medico of Roma, Italy
Carlo Massaroni, Università Campus Bio-Medico of Roma, Italy
Stefano Cinti, University of Naples Federico II, Italy
Sara Cimini, Università Campus Bio-Medico of Roma, Italy
Laura De Gara, Università Campus Bio-Medico of Roma, Italy
Emiliano Schena, Università Campus Bio-Medico of Roma, Italy

SESSION 7.2 - Special Session - Cybersecurity standards and technologies for IoT and industry 4.0 (SECURITYSTANDARDS)

Room: Room B109 - Povo Scientific Campus

Chairs: Alan Oliveira, *University of Lisbon, Portugal*

Lucila Bento, *UState University of Rio de Janeiro, Brazil*

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Alan Oliveira de Sá, Universidade de Lisboa, Portugal
Raphael C. S. Machado, Inmetro and UFF, Brazil
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Wilson S. Melo Jr, National Institute of Metrology, Quality, and Technology, Brazil
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Maxli Campos, Universidade Federal Fluminense, Brazil
Elson Gomes, Itaipu Technological Park Foundation Brazil, Brazil
Raphael Machado, Inmetro and UFF, Brazil
-

Thursday, June 9

SESSION 8.1 - Special Session - Wearable sensors and devices for unobtrusive human activities and physiological monitoring - PART II

Room: Room B107 - Povo Scientific Campus

Chairs: Carlo Massaroni, *Università Campus Bio-Medico di Roma, Italy*
Emiliano Schena, *Università Campus Bio-Medico di Roma, Italy*

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Carlo Massaroni, Università Campus Bio-Medico di Roma, Italy
Chiara Romano, Università Campus Bio-Medico di Roma, Italy
Francesca De Tommasi, Università Campus Bio-Medico di Roma, Italy
Milena B. Čukić, Complutense University of Madrid, Spain
Massimiliano Carassiti, Università Campus Bio-Medico di Roma, Italy
Domenico Formica, Università Campus Bio-Medico di Roma, Italy
Emiliano Schena, Università Campus Bio-Medico di Roma, Italy

328 Heart Rate Monitoring With Smartphone Built-In Frontal Digital Camera

Nunzia Molinaro, Università Campus Bio-Medico di Roma, Italy
Emiliano Schena, Università Campus Bio-Medico di Roma, Italy
Sergio Silvestri, Università Campus Bio-Medico di Roma, Italy
Carlo Massaroni, Università Campus Bio-Medico di Roma, Italy

333 Open-MBIC: an Open-Source Android Library for Multiple Simultaneous Bluetooth Low Energy Connections

Silvia Zampato, University of Padova, Italy
Carlo Alberto Bernardini, University of Padova, Italy
Zimi Sawacha, University of Padova, Italy
Michele Rossi, University of Padova, Italy

338 Machine learning algorithms for the activity monitoring of elders by home sensor network

Nicole Morresi, Università Politecnica delle Marche, Italy
Sara Casaccia, Università Politecnica delle Marche, Italy
Lorenzo Scalise, Università Politecnica delle Marche, Italy
Gian Marco Revel, Università Politecnica delle Marche, Italy

SESSION 8.2 - Special Session - Reliable wireless solutions for IoT and Industrial IoT

Room: Room B108 - Povo Scientific Campus

Chair: Paolo Ferrari, *University of Brescia, Italy*

343 The Underestimated Influence of Air Quality - Implementing a Homogenous Network Structure for an IoT-Based Data Acquisition and Analysis System

David Merkl, Frankfurt University of Applied Sciences, Germany
Markus Krauß, Frankfurt University of Applied Sciences, Germany
Matthias F. Wagner, Frankfurt University of Applied Sciences, Germany

349 Simulating scalability of a transparent LoRaWAN enhancement for emergency communication

Paolo Ferrari, University of Brescia, Italy
Emiliano Sisinni, University of Brescia, Italy
Paolo Bellagente, University of Brescia, Italy
Alessandro Depari, University of Brescia, Italy
Dhiego Fernandes Carvalho, University of Brescia, Italy
Alessandra Flammini, University of Brescia, Italy
Marco Pasetti, University of Brescia, Italy
Stefano Rinaldi, University of Brescia, Italy

354 Smart Measurement Systems Exploiting Adaptive LoRaWAN Under Power Consumption Constraints: a RL Approach

Tommaso Fedullo, University of Padova, University of Modena and Reggio Emilia, Italy
Alberto Morato, CNR-IEIT, Italy
Federico Tramarin, University of Modena and Reggio Emilia, Italy
Paolo Ferrari, University of Brescia, Italy
Emiliano Sisinni, University of Brescia, Italy

360 Ultra-Wideband for Distance Measurement and Positioning in Functional Safety Applications

Giovanni Peserico, University of Padova, Italy
Tommaso Fedullo, University of Padova, University of Modena and Reggio Emilia, Italy
Alberto Morato, CNR-IEIT, Italy
Federico Tramarin, University of Modena and Reggio Emilia, Italy
Stefano Vitturi, CNR-IEIT, Italy

SESSION 9.1 - Special Session - Smart Systems based on Fiber Optic sensors for Industry 4.0

Room: Room B107 - Povo Scientific Campus

Chairs: *Daniela Lo Presti, Università Campus Bio-Medico di Roma, Italy*
Cátia Leitão, University of Aveiro, Portugal

366 3D Printed Wearable FBG based Devices: A Proof of Concept for Heart Rate Monitoring

Cátia Tavares, University of Aveiro, Portugal
Cátia Leitão, University of Aveiro, Portugal
Daniela Lo Presti, Università Campus Bio-Medico di Roma, Italy
Emiliano Schena, Università Campus Bio-Medico di Roma, Italy
M. Fátima Domingues, University of Aveiro, Portugal
Nélia Alberto, University of Aveiro, Portugal
Hugo Plácido da Silva, University of Lisbon, PLUX - Wireless Biosignals, Portugal
Paulo Antunes, University of Aveiro, Portugal

371 Fiber optic plant wearable sensors for growth and microclimate monitoring

Daniela Lo Presti, Università Campus Bio-Medico di Roma, Italy
Joshua Di Tocco, Università Campus Bio-Medico di Roma, Italy
Carlo Massaroni, Università Campus Bio-Medico di Roma, Italy
Sara Cimini, Università Campus Bio-Medico di Roma, Italy
Stefano Cinti, University of Naples Federico II, Italy
Rosaria D'Amato, ENEA, Italy
Michele A. Caponero, ENEA, Italy
Laura De Gara, Università Campus Bio-Medico di Roma, Italy
Emiliano Schena, Università Campus Bio-Medico di Roma, Italy

377 Wearable Systems Based on Fiber Bragg Grating Sensors for Respiratory monitoring: Design, Fabrication, Open Challenges, and Future Directions

Daniela Lo Presti, Università Campus Bio-Medico di Roma, Italy
Joshua Di Tocco, Università Campus Bio-Medico di Roma, Italy
Carlo Massaroni, Università Campus Bio-Medico di Roma, Italy
Emiliano Schena, Università Campus Bio-Medico di Roma, Italy
Domenico Formica, Università Campus Bio-Medico di Roma, Italy

SESSION 9.2 - Special Session - Measurements and Virtual Measurements for Industry 4.0: Approaches and solutions for smart manufacturing

Room: Room B108 - Povo Scientific Campus

Chairs: *Antonella Gaspari, Polytechnic of Bari, Italy*
Emanuela Natale, University of L'Aquila, Italy

- 382 **Automated inspection of composite components: comparison between methods**
Giulio D'Emilia, University of L'Aquila, Italy
Luciano Chiominto, University of L'Aquila, Italy
Laura Fabbiano, Polytechnic of Bari, Italy
Antonella Gaspari, Polytechnic of Bari, Italy
Emanuela Natale, University of L'Aquila, Italy
- 387 **Increase the accuracy in direct 3D-Printing of mathematical patterns for smart manufacturing**
Francesca Bertacchini, University of Calabria, Italy
Eleonora Bilotta, University of Calabria, Italy
Francesco Demarco, University of Calabria, Italy
Pietro Pantano, University of Calabria, Italy
Carmelo Scuro, University of Calabria, Italy
- 392 **Integration and Digitalization of a TIR Measurement System for Roll Manufacturing Industry**
Dung T. Nguyen, Youngstown State University, USA
Kenneth Diogo, Youngstown State University, USA
Farzad Ahmadi, Youngstown State University, USA

SESSION 10.1 - Emerging Techniques for measuring and detecting anomalies in Industrial and Medical IoT

Room: Room B107 - Povo Scientific Campus

Chair: Francesco Scardulla, *University of Palermo, Italy*

- 397 **A TinyML approach to non-repudiable anomaly detection in extreme industrial environments**
Mattia Antonini, Fondazione Bruno Kessler, Trento, Italy
Miguel Pincheira, Fondazione Bruno Kessler, Trento, Italy
Massimo Vecchio, Fondazione Bruno Kessler, Trento, Italy
Fabio Antonelli, Fondazione Bruno Kessler, Trento, Italy
- 403 **Data-driven leak detection and localization using LPWAN and Deep Learning**
Rodrigo P. Rolle, Sao Paulo State University, Brazil
Lucas N. Monteiro, Sao Paulo State University, Brazil
Lucas R. Tomazini, Sao Paulo State University, Brazil
Eduardo P. Godoy, Sao Paulo State University, Brazil
- 408 **A data-stream TinyML compression algorithm for vehicular applications: a case study**
Marianne Silva, Federal University of Rio Grande do Norte, Brazil
Gabriel Signoretti, Federal University of Rio Grande do Norte, Brazil
Thommas Flores, Federal University of Rio Grande do Norte, Brazil
Pedro Andrade, Federal University of Rio Grande do Norte, Brazil
Jordao Silva, Federal University of Rio Grande do Norte, Brazil
Ivanovitch Silva, Federal University of Rio Grande do Norte, Brazil
Emiliano Sisinni, University of Brescia, Italy
Paolo Ferrari, University of Brescia, Italy
- 414 **Blood pressure acquisitions with a prototypal PPGbased device**
Francesco Scardulla, University of Palermo, Italy
Nicola Montinaro, University of Palermo, Italy
Leonardo D'Acquisto, University of Palermo, Italy

SESSION 10.2 - General Session

Room: Room B108 - Povo Scientific Campus

Chair: Matteo Nardello, *University of Trento, Italy*

- 419 **Complex impedance measurement front-end based on an on/off lock-in amplifier**
Ernesto Serrano-Finetti, Universitat Politècnica de Catalunya, Spain
Gemma Hornero, Universitat Politècnica de Catalunya, Spain
Oscar Casas, Universitat Politècnica de Catalunya, Spain

- 424 **Deployment of a LoRa-based Network and Web Monitoring Application for a Smart Farm**
Mohamed Saban, ETSE School of Engineering, Spain
Otman Aghzout, ENSA School of Engineering, Morocco
Alfredo Rosado-Munoz, ETSE School of Engineering, Spain
- 428 **Design of a novel PWV-Varying Arterial Simulator for biomedical applications: a preliminary study**
Fabio Fuiano, Roma Tre University, Italy
Andrea Scorza, Roma Tre University, Italy
Salvatore Andrea Sciuto, Roma Tre University, Italy
- 433 **Continuous EMF Monitoring as an Emergency and Disaster Detection Tool**
Nikola Djuric, University of Novi Sad, Serbia
Dragan Kljajic, University of Novi Sad, Serbia
Vidak Otasevic, Regulatory Agency for Electronic Communications and Postal Services, Serbia
Snezana Djuric, University of Novi Sad, Serbia