IEEE Region 8

IEEE Italy Section

POLITECNICO MILANO 1863

IEEE RTSI 2024

RESEARCH AND TECHNOLOGIES FOR SOCIETY AND INDUSTRY

8th International Forum

POLITECNICO DI MILANO
Polo Territoriale di Lecco
SEPTEMBER 18-20, 2024

FINAL PROGRAM

Welcome Message from the General Chairs

On behalf of the IEEE RTSI (Research and Technologies for Science and Industry), the IEEE Italy Section, and the IEEE Region 8, it is our great pleasure to warmly welcome all of you to the 8th Edition of RTSI. The event will take place at Politecnico di Milano – Polo Territoriale di Lecco from Wednesday, September 18th to Friday, September 20th, 2024.

IEEE RTSI 2024: The RTSI (Research and Technologies for Society and Industry) forum has been the flagship conference of the IEEE Italy Section for 6 years. In 2021, R8 approved to make this conference an R8 portfolio conference because of its industry focus.

The rapid advancement of technology in electrical, electronic, and ICT sciences has greatly impacted our society. Artificial intelligence has particularly played a significant role in driving these changes. This innovation not only affects technologies, but also has a continuous influence on economies and societies. The main focus of the conference will be on the challenges in artificial intelligence, examining the transition from research to industry perspectives.

The primary goal of RTSI is to bring together researchers and industry professionals in the technical fields covered by IEEE in order to:

- Promote and strengthen partnerships and cooperation between academia and industry.
- Increase understanding and awareness of how engineering and technology can have a positive impact on the quality of life.
- Foster discussion between the research community and government agencies on effective and successful research policies.
- Disseminate the latest progress, discoveries, and innovative applications.
- Promote cooperation between researchers working in different fields of research.

The RTSI program is highly diverse, including plenary sessions, regular technical sessions, special sessions, panels, tutorials, and special events dedicated to students and young professionals, Women in Engineering, entrepreneurs, and industries.

RTSI offers an excellent opportunity for companies involved in the technical fields covered by the IEEE to present their activities, meet different stakeholders, and contribute to the national and international debate on relevant topics.

About 250 delegates are expected to attend the conference to discuss and share experiences on how AI will shape our futures in Energy, Transportation, Industry, and Smart Living. This year we have the Technical sponsorship of the IEEE Industry Application Society, the IEEE Industrial Electronics, the IEEE Vehicular Technology, and 16 Chapters and the financial patronage of ABB, IEEE Future Directions, SPS, and STMicrolectronics.

The Award Ceremony will take place during the gala dinner and the closing session. It will announce the winners of the various competitions and the best paper award.

We hope that all attendees have a stimulating experience sharing research findings with colleagues, as well as exchanging and discussing new ideas, no matter which way they choose to attend the conference.

Giambattista Gruosso
Diego Ragazzi
IEEE RTSI 2024 General Chairs

RTSI 2024 Technical Program Committee Chairs' Welcome Letter

It is a great pleasure to present the program of RTSI 2024 and to welcome you all to Lecco, where we are sure you will find an exciting environment to explore the themes of this year's edition.
The 8th edition of IEEE International Forum "Research and Technology for Society and Industry" features a very rich program focused on Artificial Intelligence (AI) considering both the research and industry perspectives. To highlight the impacts of AI in different contexts, four main tracks were considered: Methods and Technologies for AI, AI Applications to Energy and Transportation Systems, AI Applications to Health and Smart Living and AI Applications for Industry.
These themes will be explored across 22 technical sessions, 6 special sessions, 1 plenary speech, 2 keynotes, 3 invited talks, 3 tutorials, and 7 workshops. A total of 117 contributed papers, authored by researchers from 15 countries, have been accepted for presentation and will be published in the conference proceedings and submitted for publication on IEEE Xplore.
We are also delighted to host a panel organized by the IEEE Women in Engineering Italian Affinity Group (WiE) on "The advantages derived from female presence in working realities", as well as an IEEE Young Professionals (YP) competition.
In addition to IEEE WiE, IEEE YP, and IEEE Future Directions, this year's edition is supported by technical sponsorship from IEEE Region 8, the IEEE Italy Section and the IEEE Tunisia Section, along with three IEEE Societies (Industrial Electronics, Industry Applications, and Vehicular Technologies) and fifteen Italian Chapters.
This rich program is only made possible thanks to the effort of many individuals to whom we extend our sincere gratitude. We would like to thank all the track chairs, special sessions organizers, and reviewers who delivered quality reviews within demanding timescales. Special thanks go to our colleagues who will share their valuable expertise during the conference by leading tutorials and chairing workshops and technical sessions. Finally, we would like to thank all the authors who submitted their papers to RTSI 2024 and all the attendees coming from around the world.
We hope you will enjoy this edition's technical program, and we look forward to sharing this experience with you.

Maide Bucolo
Samuele Grillo
IEEE RTSI 2024 Technical Program Committee Chairs

IEEE RTSI 2024 Committees

HONORARY CHAIR
Vincenzo Piuri, *Region 8 Director 2023-2024, University of Milan*

GENERAL CHAIRS
Giambattista Gruosso, *IEEE Italy Section Vice-Chair, Politecnico di Milano*
Diego Ragazzi, *Cefriel*

STEERING COMMITTEE CHAIR
Gianfranco Chicco (Italy) – *Italy Section Chair*

STEERING COMMITTEE
Sergio Rapuano (Italy) – *RTSI 2021 General co-Chair*
Frederique Valle (France) – *RTSI 2022 General co-Chair*
Giambattista Gruosso (Italy) – *RTSI 2024 General Chair*
Marios Antoniou (Cyprus) – *R8 Vice-Chair TA*
Tiziana Tambosso (Italy) – *R8 Conference Committee Chair*
Toni Mattila – *R8 Action for Industry Committee Chair*
Fadoua Drira (Tunisia) - *RTSI 2025 General co-Chair*

TECHNICAL PROGRAM COMMITTEE CHAIR
Samuele Grillo, *Politecnico di Milano*

TECHNICAL PROGRAM COMMITTEE CO-CHAIR
Maide Bucolo, *Università di Catania*

TUTORIAL CHAIR
Cesar Diaz Londono, *Politecnico di Milano*

PUBLICITY CHAIRS
Laura Brambilla, *Politecnico di Milano*
Greta Moretto, *SPS Italia*

PUBLICATION CHAIR
Marzio Barresi, *Politecnico di Milano*

TREASURER
Pisana Placidi, *IEEE Italy Section Treasurer*

INDUSTRY EVENTS COMMITTEE
Serge Dos Santos, *INSA – FR e R8 Action for Industry Committee Member*
Toni Matila, *IEEE R8 Action for Industry Committee Chair*
Danilo Pau, *ST Microelectronics and IEEE Italy Section Industry Ambassador*
Enrico Ragaini, *ABB and IEEE Italy Section Industry Ambassador*

ENTREPRENEURSHIP EVENTS COMMITTEE
Rawane El-jamal, *IEEE R8 Entrepreneurship Committee Chair*
Tiziana Tambosso, *IEEE Italy Section Entrepreneurship Committee Chair*

IEEE RTSI 2024 Tracks and Special Sessions

TRACK #1 - Methods and Technologies for AI

TRACK CHAIRS
Marco Baldi, *Università Politecnica delle Marche, Italy*
Fabrizio Dabbene, *IEIIT, National Research Council, Italy*
Daniele Linaro, *Politecnico di Milano, Italy*
Concetto Spampinato, *University of Catania, Italy*
Stefanos Vrochidis, *Information Technologies Institute, CERTH, Greece*

TRACK #2 - AI Applications to Energy and Transportation Systems

TRACK CHAIRS
Jelena Ponocko, *University of Manchester, UK*
Silvia Siri, *University of Genova, Italy*
Stefano Radrizzani, *Politecnico di Milano, Italy*

TRACK #3 - AI Applications to Health and Smart Living

TRACK CHAIRS
Leopoldo Angrisani, *University of Naples Federico II, Italy*
Riccardo Bellazzi, *University of Pavia, Italy*
Laura Giarrè, *University of Modena and Reggio Emilia, Italy*
Linda Pattini, *Politecnico di Milano, Italy*

TRACK #4 - AI Applications for Industry

TRACK CHAIRS
Sergio Terzi, *Politecnico di Milano, Italy*
Fabio Ruggiero, *University of Naples Federico II, Italy*

SPECIAL SESSION #03 - AI for microscopy, imaging and bio-data analytics

ORGANIZED BY
Pasquale Memmolo, Pietro Ferraro, *National Research Council, Italy*

SPECIAL SESSION #04 - Telecommunications Solutions for Next-Generation Industrial IoT

ORGANIZED BY
Luciano Miuccio, Salvatore Riolo, *University of Catania, Italy*
Enrico Testi, *University of Bologna, Italy*
Giampaolo Cuozzo, *National Laboratory of Wireless Communications, CNIT, Italy*

SPECIAL SESSION #05 - Techniques AI-based for Innovative High Frequency Power Converters: Analysis of Architectures, Components, Controllers and Materials

ORGANIZED BY
Vittorio Bertolini, *University of Perugia, Italy*
Fabio Corti, *University of Florence, Italy*

SPECIAL SESSION #07 - AI and ICT to support robotic rehabilitation – the activity 7 of fit4med project

ORGANIZED BY
Riccardo Bellazzi, Stefano Ramat, *University of Pavia, Italy*

SPECIAL SESSION #11 - Artificial Intelligence in Medical Applications

ORGANIZED BY
Sabatina Criscuolo, *University of Naples Federico II, Italy*
Daniele Spoladore, *STIIMA, National Research Council, Italy*
Egidio De Benedetto, *University of Naples Federico II, Italy*

SPECIAL SESSION #12 - Simulation, co-simulation and digital twins for CCAM: AI opportunities and challenges

ORGANIZED BY
Gennaro Nicola Bifulco, *University of Naples Federico II, Italy*
Roberta di Pace, *University of Salerno*

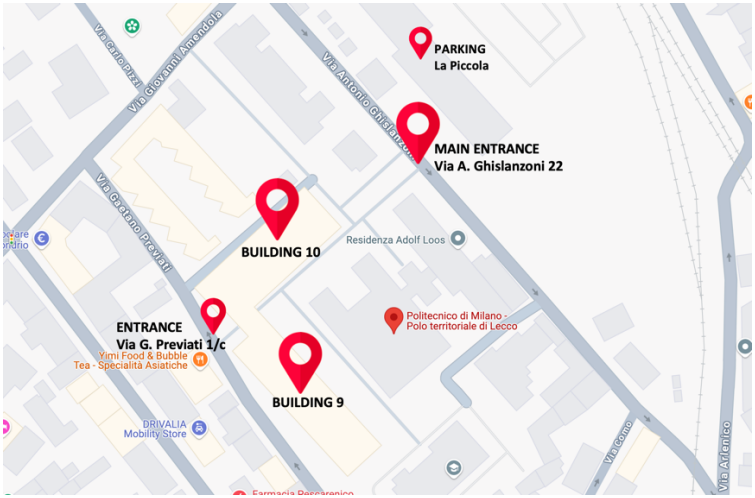
IEEE RTSI 2024 Venue

IEEE RTSI 2024 will be held at Politecnico di Milano - Polo territoriale di Lecco.

Polo di Lecco have a brand new university campus: 47.000 m^2 dedicated to instruction, research and student services. This means modern classrooms where innovative teaching can take place, "state-of-the-arts" labs, and on-campus living space for 204 international and non-resident of Lecco students.

ADDRESS

Politecnico di Milano - Polo territoriale di Lecco
Via Ghislanzoni, 22 - Lecco

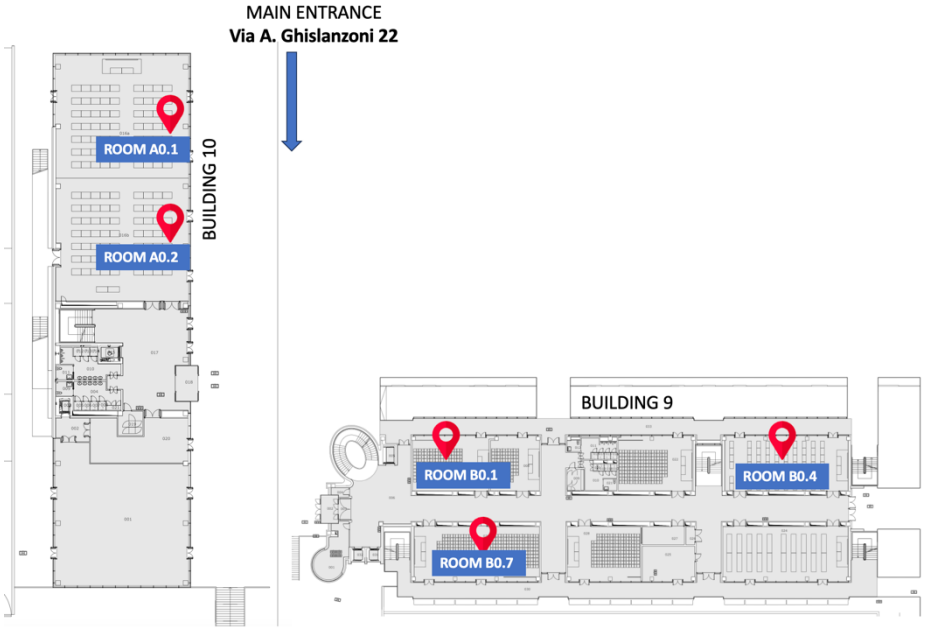


Technical Sessions will be held in

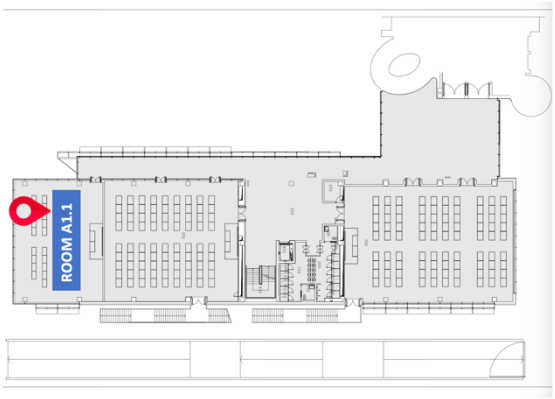
Room A0.1 - Building 10 - Ground Floor - **Sept 18 - 19 - 20**
Room A0.2 - Building 10 - Ground Floor - **Sept 18 - 19 - 20**
Room A1.1 - Building 10 - First Floor - **Sept 18 - 19 - 20**
Room B0.1 - Building 9 - Ground Floor - **Sept 18 - 19 - 20**
Room B0.4 - Building 9 - Ground Floor - **Sept 18 - 20**
Room B0.7 - Building 9 - Ground Floor - **Sept 19**

IEEE RTSI 2024 Venue Maps

Building 10 - Building 9 - Ground Floor



Building 10 - First Floor



IEEE RTSI 2024 Keynote Speakers

Wednesday September 18 - H 11:30

IEEE's Data-based Strategy and some leading offerings

Rakesh **KUMAR**

Chair, IEEE DataPort - Chair, IEEE/TA Data Strategy Ad Hoc
Past-Chair, IEEE Roadmaps - Past-President IEEE Solid-State Circuits Society
Founder & President TCX Technology Connexions

ABSTRACT

New projects emanating from the IEEE/TA Data Strategy Ad Hoc committee leverage IEEE's Data to create value for customers worldwide. The first is an Artificial Intelligence/Machine Learning based combination Search and Knowledge engine that uses NLP (Natural Language Processing) and RAG (Retrieval Augmented Generation). "AskIEEE" allows users to ask questions in their own format and get answers based on IEEE information that has been ingested into the engine. The second expands the present use of IEEE DataPort to reach a broader spectrum of users. This talk will present capabilities and successes of the first two pilot products and discuss opportunities to expand the reach members worldwide.

AI Hardware Reliability Risks and Impact on System Safety and Security

Cecilia **METRA**

DEI - ARCES, University of Bologna

ABSTRACT

Artificial Intelligence (AI) is experiencing an unprecedented widespread adoption in multiple application fields. AI reliability and safety are of major concern. They depend also on the reliability of the hardware implementing the AI. Reliability risks for the AI hardware with respect to faults and aging conditions possibly occurring during its operation in the field will be discussed, together with their impact on system's safety and security.

IEEE RTSI 2024 Invited Speakers

Wednesday September 18 - H 14:30

AI in manufacturing: challenges and opportunities

Prof. Donatella **CORTI**
University of Applied Sciences and Arts of Southern Switzerland

ABSTRACT

The transformative wave of Industry 4.0 has engendered significant shifts in the manufacturing landscape bringing unprecedented results in production performance. This revolution, based on the adoption of AI and advanced technologies, has far-reaching implications, not just for operational efficiencies, but also from the organizational and culture points of view. Tough benefits are clear, their achievement is not straightforward. The talk analyses main opportunities and challenges linked to the diffusion of AI in manufacturing, while main trends are highlighted. Applications examples are also provided.

Wednesday September 18 - H 16:30

Intelligent holotomographic microscopy for label-free single-cell classification

Dr Pasquale **MEMMOLO**
ISASI - National Research Council

ABSTRACT

Currently, holographic microscopy (HM) is one of the most powerful label-free and quantitative phase imaging modality for single-cell analysis. The combination of HM with microfluidics unlocks the possibility to record images of flowing and rotating cells in microchannels, thus collecting digital holograms of the same cell taken from multiple orientations and allowing the

3D tomographic reconstruction. Such a wealth of information contained in holotomographic images of single cells can be exploited to address unprecedent challenges with the help of Artificial Intelligence, thus opening the way to advanced analysis of biological specimens. Here, the "Intelligent" holotomographic microscope in flow cytometry will be described with the main focus on applications of cancer cells analysis and classification, thus demonstrating a proof of concept about the label-free liquid biopsy.

Thursday September 19 - H 08:30

Optimal Charging and Speed Control of Electric Automated Buses in Intercity Lines

Prof. Silvia **SIRI**
University of Genova, Italy

IEEE RTSI 2024 Workshops / Panels / Round Tables

IEEE EPPC - Panel on Artificial Intelligence

Wednesday, September 18 - 10:45

Understanding the AI Act:
Implementation, Impacts and Implications for various technology domains

This policy panel explores how the EU AI Act may affect various technology domains, including the ICT infrastructure, networks, connectivity, transportation, and healthcare. The panel also looks at the roles that technologists may play to support the operationalization of the AI Act and at their responsibilities in ensuring compliance with the provisions of the AI Act.
Moderated by Cecilia Metra

Talk 1 by Constantinos Balictsis
The EU AI Act in the 'Digital Decade 2030' Realm
The twin Digital and Green transitions led to a host of EU interventions. The EU adopted and closely monitors the 'Digital Decade Policy Programme' where, by 2030, major collective targets pertain to secure and sustainable digital infrastructures delivering gigabit connectivity for everyone and 5G coverage everywhere, as well as the wide deployment and adoption of AI. Deployment and uptake of 'Very High-Capacity Networks' constitute major EU objectives to increase the capacities/ capabilities from the core network to the very edge, to satisfy existent and anticipated user demands of a data-driven society, and to enhance the competitiveness of the EU economy. AI may be utilized in the operation/management of such end-to-end critical digital infrastructures while it also employs these infrastructures to provide data-driven applications/services in disparate economic sectors/verticals. Moreover, in the EU, the announced 'AI Innovation' package complements the adopted AI Act to promote trustworthy AI and facilitate an innovative AI ecosystem. The ramifications of the AI Act's risk-based approach on the critical digital infrastructures and aspects soliciting further constructive contributions by stakeholders will be highlighted.

Talk 2 by Yuri Ladeia
The intersections and overlaps between EU Compliance Regulations in Health: AI Act, EHDS, MDR and GDPR
Although complex, EU compliance regulations integrate various challenges through a common logic. The identification and harmonisation through standards of the different regimes in the health context, from those of specific application (AI Act, Medical Device Regulation – MDR) to those of general application (GDPR), can simplify the application of the regulations. For example, the AI Act is based on the MDR, requiring conformity assessments and certification by notified bodies, using a risk-based classification system and focusing on the traceability of products throughout their life cycle, including clinical evaluation and market surveillance. More than connections, there is also, among the various aspects of the interaction between the MDR, GDPR and AI Act, the potential overlap of obligations and responsibilities between the various players who are obliged to comply with the respective regulations, from the Provider, User, Importer or Distributor. Clarifying the overlaps and identifying the intersections is the key to boosting sustained innovation in digital health, biomedical research and the reuse of data to create value.

Talk 3 by Meng Lu

The EU AI Act Implications for the Transport Systems and Standards Requirements

AI is not new, but becomes a fast runner on the market, including applications in ITS (Intelligent Transport Systems). Technologies in the ITS domain include, e.g. control system engineering, (absolute and relative) positioning, communications, sensing and information processing. A wide range of products, solutions and services have been applied to all modes of transport (even the third dimension for Urban Air Mobility), and to cross-sector multi-modal logistics and supply chains. Future mobility is not only intended to improve the quality of life, but also to create thriving communities, by better caring for, and even restoring nature and the environment, supporting economic growth, and increasing the potential positive social impact. This talk focuses on AI and ITS, addresses relevant standards issues, shares recommendations from the IEEE European Public Policy Committee (EPPC), especially regarding Privacy and Data Protection, Cybersecurity, Public Safety, Product Dependability, Interoperability, Accessibility, as well as Land Use and Traffic.

WORKSHOP - Advancing Technology for Humanity in Action with IEEE Humanitarian Technologies Consortium

Wednesday, September 18 - 14:00

Take a moment and think about what is humanitarian for you. Are there any community challenges around you? IEEE is supporting its volunteers in order to implement humanitarian projects locally through its IEEE Humanitarian Technologies (IHT) consortium. This workshop is your gateway to dive into various IHT programs and initiatives to apply technology and solve the world's most pressing problems with support from IEEE. At the same time, it will interactively guide you on how to prepare humanitarian technology project proposals for IHT programs, focusing on avoiding common pitfalls and enhancing your collaborations with local communities and industries.

INDUSTRY WORKSHOP - AI In Manufacturing

Wednesday, September 18 - 16:30

This session will explore the role of Artificial Intelligence in manufacturing industries of tomorrow. The session will bring together a diverse group of panelists with experience in academic research, technology transfer, and entrepreneurship.

WORKSHOP - Humanoid Robotics Go Ubiquitous! Industries and Researchers as the Key Enablers

Thursday, September 19 - 08:50

Human-like robots are set to be ubiquitous as mobility means, TV, home appliances, and smartphones. The impact is expected to be on every one of us in everyday life: we will interact to them in many ways, asking for help on a broad range of daily task we need to accomplish anytime.
Many industries, research entities and universities across the world are actively working on that and the list of them is growing with daily announcements of ground-breaking progress both from a technology standpoint and use cases. Indeed, initial deployments are in the logistic and manufacturing industry sectors where to gather experience, proof to be accurate and tune their functionalities; it is expected many others will be addressed in the very next years.
It's an inevitable and revolutionary progress for humanity and from many points of view: research is suggesting increasing similarities to how human beings perceive, behave and act. This is inspiring and has motivated huge investments by many industries and start-ups in US, Europe, China and Japan. An example of progress is the need to provide ground-breaking decentralized AI algorithms, and many other sub-components with associated functional applications to build a sophisticated, complex, cooperative, and safe system such as a humanoid robot. Their electronics systems are required to be low energy and efficient, be accurate in their actions, adopt cheap sensors (any type of), and embody powerful next generation of embedded processing and actuators. All of that represents an unprecedented unique opportunity for AI to evolve to the next level for the entire humanity to benefit from.

OBJECTIVE
This workshop is aimed to present some examples of humanoid robots developed in Italy and Europe both at industrial and research level. Many involved dimensions will be represented such as applications, AI algorithms, mechanical components, and electronics.
Furthermore, the workshop will help to reason on the impacts Humanoid Robotics can bring to the broader industry and humanity. They will be the main actors of making happen and widely available to the scale what Alain Turing imagined on mid-20th century.
Two major topics will be addressed during the Workshop: (i) some exemplary applications that shows the practicality of the approaches and the benefits introduced; and (ii) the perspective from representative experts of the electronic industry who are called to provide essential components to let humanoid robots to scale.
The workshop is structured with individual presentations and a round table where all the invited speakers will be involved in an interactive debate managed by a moderator.

WORKSHOP - IA: Macchine, Servizi e Comunicazione Reputazionale

Thursday, September 19 - 11:00

Evento in collaborazione con camera di Commercio di Lecco-Como

ROUND TABLE - AI enabler for the manufacturing: challenges, success stories and future trends

Thursday, September 19 - 14:00

WORKSHOP - Innovative StartUps and Entrepreneurship

Thursday, September 19 - 14:00

In this special workshop the future technological directions and application trends, the support offered by a scientific and professional association like IEEE, the ethics of technology, the role of university incubators/accelerators, European Programs to support innovative startups, venture capital strategies, patents and IPR protections, entrepreneurship education and an example of S&YP initiative for young entrepreneurs are presented.
Finally, a round table among all actors will answer questions from the moderator and the audience.
The workshop, organized during IEEE RTSI 2024 will be open to remote participation.

PANEL IEEE WiE - The advantages derived from female presence in working realities

Friday, September 20 - 09:00

The IEEE Italy Section Women in Engineering Affinity Group organizes panel session “The advantages derived from female presence in working realities” on Friday September 20th 2024 (from 9:00 up to 10:30 am) at Politecnico di Milano – Polo territoriale di Lecco – Building 10, Via Ghislanzoni, 22 – Lecco (LC).
The panel is focused in the presentation of direct experiences with respect to the socio-economic advantages derived from the presence of women in the working reality. International and national experiences will be referred by four speakers coming from different working realities. A final debate will be used to share the best practices and to define the strategy aiming to cover the knowledge gap with respect to the topic.

WORKSHOP - The Role of AI in Clinical Engineering

Friday, September 20 - 11:00

IEEE RTSI 2024 Social Events

WELCOME RECEPTION
Wednesday September 18 - H 19:30

The Welcome Reception will be held at "**Frigerio Retaurant**" - on **Wednesday September 18 - 19.30**.

ADDRESS
Piazza XX Settembre, 54
Lecco

GALA DINNER
Thursday September 19 - H 19:30

The Gala Dinner will be held at " **Griso Panorama Restaurant**" on **Thursday September 19 - 19.30**.

ADDRESS
Via Provinciale, 51
Malgrade, Lecco

Access to Welcome Reception and Conference Dinner is guaranteed only to ticket holders. For further information, please ask at the registration desk.

Technical Program - Wednesday, September 18

08:00 - 17:00	*Politecnico di Milano - Polo Territoriale di Lecco* **REGISTRATIONS**
08:30 - 10:00	*Room A1.1* **TUTORIAL SESSION #1**

Implementation of Safe AI
Maurizio Mongelli - *CNR Italy*

08:30 - 10:00	*Room B0.4* **TUTORIAL SESSION #2**

Tiny Machine e Learning an AI core Technology
Danilo Pau - *STMicroelectronics*

08:30 - 10:00	*Room A0.2* **TUTORIAL SESSION #3**

Improving Wireless Next-Generation Industrial IoT (IIoT) Networks with Reinforcement Learning
Salvatore Riolo, Luciano Muccio - *University of Catania*

10:00 - 10:30	*Politecnico di Milano - Polo Territoriale di Lecco* **COFFEE BREAK**
10:30 - 10:45	*Room A0.1* **OPENING CEREMONY - WELCOME ADDRESSES**

Giambattista Gruosso - *Politecnico di Milano, IEEE RTSI 2024 General Chair*
Marco Tarabini - *Politecnico di Milano - Delegate for Polo Territoriale di Lecco*
Vincenzo Piuri - *IEEE R8 Director*
Sergio Rapuano - *IEEE RTSI 2024 Steering Committee - IEEE Italy Section Past Chair*
Tiziana Tambosso - *IEEE R8 Conference Coordination Committee Chair*
Maide Bucolo - *IEEE RTSI 2024 Technical Program Chair*

10:45 - 11:30	*Room A0.1* **IEEE EPPC - Panel on Artificial Intelligence** **Moderator**: Cecilia Metra, *University of Bologna, Italy*

The EU AI Act in the 'Digital Decade 2030' Realm
Constantinos Balictsis

The intersections and overlaps between EU Compliance Regulations in Health: AI Act, EHDS, MDR and GDPR
Yuri Ladeia

The EU AI Act Implications for the Transport Systems and Standards Requirements
Meng Lu

11:30 - 13:00	*Room A0.1* **KEYNOTE SPEAKERS** **Chair**: Maide Bucolo, *University of Catania, Italy*

IEEE's Data-based Strategy and some leading offerings
Rakesh Kumar, *Chair IEEE DataPort*

AI Hardware Reliability Risks and Impact on System Safety and Security
Cecilia Metra, *DEI - ARCES, University of Bologna*

13:00 - 14:00	*Politecnico di Milano - Polo Territoriale di Lecco* **LUNCH**

14:00 - 16:00	*Room A0.1* **WORKSHOP ON ADVANCING TECHNOLOGY FOR HUMANITY IN ACTION WITH IEEE HUMANITARIAN TECHNOLOGIES CONSORTIUM**

14:00	IEEE Humanitarian Technologies Overview: Engineering a Better World for All
14:10	Introduction to IEEE Humanitarian Technologies Volunteering: From Region 8 to Local Activities
14:25	Interactive Activity: Identify local community problems based on Sustainable Development Goals
14:55	IHT Programs in Focus: Impacting Local Communities with Humanitarian Projects
15:15	Focus on Industry Collaborations: Building your Team's Capacities and Supporting your Humanitarian Projects
15:30	Interactive Activity: Identify relevant technologies for community problems and coordinate with local industries to plan humanitarian projects

14:00 - 15:40 *Room A1.1*

Technical Session 1 - Track 1.1 - Methods and Technologies for AI

Chair: Vito Zago, *Istituto Nazionale di Geofisica e Vulcanologia, Italy*

14:00 **AI vs. AI: The Detection Game**
Mauro Coccoli (University of Genoa, Italy); Gabriella Patanè (Freelancer, Italy)

14:20 **A Threat Assessment Framework for Screening the Integrity of University Assessments in the Era of Large Language Models**
Alan Hickey, Cathal Ó Faoláin, John Healy, Kevin Nolan, Emer Doheny and Paul Cuffe (University College Dublin, Ireland)

14:40 **Experimental Evaluation of End-To-End Security Protocols for the Internet of Everything**
Marco Esposito, Monica Marconi Sciarroni, Tommaso Fava, Alberto Belli, Lorenzo Palma, Emanuele Storti and Paola Pierleoni (Università Politecnica delle Marche, Italy)

15:00 **Dynamic Hashtag Assignment: Leveraging Graph Convolutional Networks With Class Incremental Learning**
Matteo Kolyszko, Marco Buzzelli and Simone Bianco (University of Milano-Bicocca, Italy)

15:20 **Potentialities of AI-Based Models for Lagrangian CFD**
Vito Zago, Eleonora Amato and Ciro Del Negro (Istituto Nazionale di Geofisica e Vulcanologia, Italy)

14:00 - 15:40 *Room B0.4*

Technical Session 2 - Track 2.1 - AI Applications to Energy and Transportation Systems (Technical Sponsored by VTS Italy Chapter)

Chair: Stefano Radrizzani, *Politecnico di Milano, Italy*

14:00 **Improve Load Forecasting in Energy Communities Through Transfer Learning Using Open-Access Synthetic Profiles**
Lukas Moosbrugger, Valentin Seiler, Gerhard Huber and Peter Kepplinger (Vorarlberg University of Applied Sciences, Austria)

14:20 **Long Short Term Memory Neural Network and Energy Applications in the Smart Grid Framework**
Silvia Licciardi, Guido Ala, Elisa Francomano, Pietro Catrini, Maurizio La Villetta, Rossano Musca, Antonio Piacentino, Eleonora Riva Sanseverino and Hamid Samadi (University of Palermo, Italy)

14:40 **The Value of Forecasting: The Effect of Building Load Forecast Errors on the Performance of an Optimal Energy Management System**
Michael Wood, Emanuele Ogliari and Sonia Leva (Politecnico di Milano, Italy)

15:00 **Application of an LSTM-Based Forecaster in a Model Predictive Controller of a Microgrid**
Federico Rossi, Giancarlo Storti Gajani and Giambattista Gruosso (Politecnico di Milano, Italy)

15:20 **Time Series Forecasting to Detect Anomalous Behavior in Multiphase Flow Meters**
Tommaso Barbariol, Davide Masiero, Mattia Fanan and Gian Antonio Susto (University of Padova, Italy); Enrico Feltresi (Pietro Fiorentini SpA, Italy)

14:00 - 16:00 *Room B0.1*

Technical Session 3 - Track 3.1 - AI Applications to Health and Smart Living (sponsored by EMB Italy Chapter)

Chair: Lorenzo Gianquintieri, *Politecnico di Milano, Italy*

14:00 **Augmented Reality Visualisation for ECG Classification and Heart Disease Diagnosis**
Kahina Amara, Mohamed Amine Guerroudji, Nadia Zenati (Development Centre of Advanced Technology, Algeria); Oussama Kerdjidj, Shadi Atalla, Wathiq Mansoor (University Of Dubai, United Arab Emirates); Naeem Ramzan (University of West of Scotland, United Kingdom)

14:20 **Spatial Clustering of Ambulance Dispatches for Cardiovascular Problems During Heat and Non-Heat Days: Preliminary Study for Milan, Italy**
Julia Nawaro and Lorenzo Gianquintieri (Politecnico di Milano, Italy); Andrea Pagliosa, Giuseppe Sechi (Agenzia Regionale Emergenza Urgenza, Italy); Enrico G Caiani (Politecnico di Milano, Italy)

14:40 **Leveraging Machine Learning for Physical Exercise Recommendation Based on Heart Rate: Older Adults Personalized Training**
Atieh Mahroo (Italian National Research Council & University of Milano-Bicocca, Italy); Vera Colombo, Daniele Spoladore, Marco Sacco (Italian National Research Council, Italy)

15:00 **Improving Detection of Type-1 Diabetes Adverse Events Using GRU Networks**
Giorgia Rigamonti, Mirko Paolo Barbato, Davide Marelli and Paolo Napoletano (University of Milano-Bicocca, Italy)

15:20 **Efficient Tiny Machine Learning for Human Activity Recognition on Low-Power Edge Devices**
Vinamra Sharma (University of Glasgow, United Kingdom); Danilo Pietro Pau (STMicroelectronics, Italy); José Cano (University of Glasgow, United Kingdom)

15:40 **Automatic Detection of Artifacts in Photoplethysmography Signals Through Convolutional Neural Networks During Robot-Assisted Gait Rehabilitation**
Simone Costantini (Politecnico di Milano, Italy); Emilia Biffi and Fabio A. Storm (Scientific Institute IRCCS Eugenio Medea, Italy); Giuseppe Andreoni and Anna M. Bianchi (Politecnico di Milano, Italy)

14:00 - 16:00 *Room A0.2*

Technical Session 4 - Track 4.1 - AI Applications for Industry (sponsored by RAS Italy Chapter and TEM Italy Chapter)

Chairs: Fabio Ruggiero, *University of Naples Federico II, Italy*
Federica Torrisi, *University of Catania, INGV, Italy*

14:00 **[INVITED] AI in Manufacturing: Challenges and Opportunities**
Donatella Corti (SUPSI, Switzerland)

14:20 **Exploring Fine-Grained Retail Product Discrimination With Zero-Shot Object Classification Using Vision-Language Models**
Anil Osman Tur (University of Trento & Fondazione Bruno Kessler, SpindoxLabs, Italy); Alessandro Conti (University of Trento, Italy); Cigdem Beyan (University of Verona, Italy); Davide Boscaini

(Fondazione Bruno Kessler, Italy); Roberto Larcher (Spindox Labs, Italy); Stefano Messelodi and Fabio Poiesi (Fondazione Bruno Kessler, Italy); Elisa Ricci (University of Trento, Italy)

14:40 **A Topological Optimization Through Reinforcement Learning: An Electromagnetic Case Study**
Enrico Spateri and Giambattista Gruosso (Politecnico di Milano, Italy)

15:00 **Intelligent Approach for Fouling Detection in Phase Change Heat Exchanger**
Mustafa Alnaser (Yokogawa Saudi Arabia, Saudi Arabia); Sami El Ferik (King Fahd University of Petroleum and Minerals, Saudi Arabia); Abdullatif Alnajim and Abrar Al-Amoudi (Yokogawa Saudi Arabia Company, Saudi Arabia); Rached Ben-Mansour (KFUPM, Saudi Arabia)

15:20 **Deep Learning-Powered Computer Vision System for Selective Disassembly of Waste Printed Circuit Boards**
Muhammad Mohsin, Stefano Rovetta, Francesco Masulli (University of Genova, Italy); Danilo Greco (Politecnico di Milano, Italy); Alberto Cabri (University of Milan, Italy)

15:40 **Challenges and Opportunities in Deep Learning and Geostationary Satellite Remote Sensing for Volcanic Cloud Monitoring**
Federica Torrisi, Claudia Corradino, Simona Cariello, Giovanni Salvatore Di Bella, Ciro Del Negro (Istituto Nazionale di Geofisica e Vulcanologia, Italy)

16:00 - 16:30 *Politecnico di Milano - Polo Territoriale di Lecco*
COFFEE BREAK

16:30 - 18:30 *Room A0.1*
INDUSTRY WORKSHOP - AI IN MANUFACTURING
Moderator: Toni Mattila, *IEEE R8 Afi Committee Chair*

16:30 **Welcome to participants**
Toni Manila, *IEEE R8 Afi Committee Chair*

16:35 **Making and Maintaining our Connections in Industry (online)**
Tom Coughlin, *IEEE President*

16:50 **Artificial Intelligence and Machine Learning for Smart and Sustainable Manufacturing**
Vincenzo Piuri, *University of Milan & IEEE Region 8 Director*

17:05 **Application of AI to Low Voltage power distribution devices and digital solutions**
Paolo Gritti, *Innovation and Common Technologies Manager at ABB Smart Power*

17:20 **Distributed Artificial Intelligence for Industrial Applications**
Viviana D'Alto, *STMicroelectronics*

17:35 **NDE4.0: an optimized merging of Industry 4.0, Nondestructive Testing (NDT) and Artificial Intelligence (AI)**
Serge Dos Santos, *INSA Centre Val de Loire*

17:50 **Q&A & Round Table**

16:30 - 18:10 *Room A1.1*

Technical Session 5 - Track 1.2 - Methods and Technologies for AI (sponsored by CAS-C&S Italy Chapter)

Chair: Daniele Linaro, *Politecnico di Milano*

16:30 **UAV Flight Control via Quaternion Neural Networks and Closed Loop Lyapunov Function**

Paolo Arena (Università Degli Studi Di Catania, Italy); Emanuele Cannizzo and Alessia Li Noce (University of Catania, Italy); Luca Patanè (University of Messina, Italy)

16:50 **Using Active Learning to Improve Learning Performance**

Clarissa Valeria Amico and Roberto Cigolini (Politecnico di Milano, Italy)

17:10 **Quaternion Valued Neural Network for Modeling Vibrating Electromechanical Structures to Reduce Physical Vibrating Hazard in the Work Environment**

Matteo Di Mauro and Luigi Fortuna (University of Catania, Italy); Arturo Buscarino (Università degli Studi di Catania, Italy); Shahzeb Zafeer and Carlo Famoso (University of Catania, Italy)

17:30 **Federated Learning for Rule-Based Systems: Preliminary Studies**

Ahmad Samandari (University of Genoa & CNR-IEIIT, Italy); Mario Marchese (University of Genoa, Italy); Alessia Paglialonga (CNR Consiglio Nazionale delle Ricerche, Italy); Fabio Patrone (University of Genoa, Italy); Vittorio Rampa and Maurizio Mongelli (National Research Council of Italy, Italy)

17:50 **AI-Assisted GIS Toward GEO-AI: Trends and Innovations Overview**

Fabio Franchi and Alessandra Galassi and Fabio Graziosi (University of L'Aquila, Italy)

16:30 - 17:50 *Room B0.4*

Technical Session 6 - Track 2.2 - AI Applications to Energy and Transportation Systems (sponsored by ITS Italy Chapter)

Chair: Silvia Siri, *University of Genova, Italy*

16:30 **Artificial Intelligence Approach to State of Charge Estimation for Smart Battery Management Systems**

Mohammad Bilal Alkouli and Md Ismail Hossain (King Fahd University of Petroleum and Minerals, Saudi Arabia); Mohammad A. Abido (KFUPM, Saudi Arabia)

16:50 **Fast Voltage Estimation on MV Distribution Networks Through a Machine Learning Hybrid**

Leonardo Gori, Alessandro Verosimile and Andrea Damiani (Politecnico di Milano, Italy); Marco D Santambrogio (Politecnico di Milano & MIT, Italy); Francesca Soldan, Enea Bionda and Carlo Tornelli (RSE, Italy)

17:10 **Energy Management System for the CN MOST Laboratory at the Savona University Campus**

Matteo Fresia, Tommaso Robbiano, Silvia Siri and Stefano Bracco (University of Genova, Italy)

17:30 **Risk Evaluation of AI Systems in the Energy Sector - Three Case Studies From TSO Business**

Fabian Heymann (Swiss Federal Office of Energy, Switzerland); Antoine Marot (RTE, France); Medha Subramanian (Elgin Energy, Ireland); Matthias Galus (Swiss Federal Office of Energy, Switzerland)

16:30 - 18:30 *Room B0.1*

Technical Session 7 - Track 3.2 - AI Applications to Health and Smart Living (sponsored by CAS-C&S Italy Chapter)

Chair: Maide Bucolo, *University of Catania, Italy*

16:30 **[INVITED] Intelligent Holotomographic Microscopy for Label-Free Single-Cell Classification**

Pasquale Memmolo (CNR-ISASI, Italy)

16:50 **Deep Neural Quantization for Speech Detection of Parkinson Disease**

Armin Mazinani (University of Parma, Italy); Danilo Pietro Pau (STMicroelectronics, Italy); Luca Davoli and Gianluigi Ferrari (University of Parma, Italy)

17:10 **Enhancing Elderly Exergaming With AI Components for Assessing Cognitive Status**

Michail Danousis and Christos Goumopoulos (University of the Aegean, Greece)

17:30 **Lightweight Graph Neural Network for Dementia Assessment From EEG Recordings**

Thomas Barbera, Simone Zini, Simone Bianco and Paolo Napoletano (University of Milano-Bicocca, Italy)

17:50 **Facial Asymmetry Classification in Neurological Disorders: Integrating Computer Vision and Machine Learning for Improved Patient Care**

Pratik Ranjan (University of Camerino & The BioRobotics Institute of Scuola Superiore Sant'Anna, Italy); Angelo Lasala (The BioRobotics Institute of Scuola Superiore Sant'Anna, Italy); Anna Lina Ruscelli (Scuola Superiore Sant'Anna, Italy); Sujit Kumar Sahu (TeCIP Institute of Scuola Superiore Sant'Anna, Italy); Diego Guarin (University of Florida, USA); Sara Moccia and Piero Castoldi (Scuola Superiore Sant'Anna, Italy); Silvestro Micera (Scuola Superiore Sant'Anna, Italy & EPFL, Switzerland); Andrea Bandini (Scuola Superiore Sant'Anna, Italy)

18:10 **Sign Language Recognition for Patient-Doctor Communication: A Multimedia / Multimodal Dataset**

Raffaele Mineo (University of Catania & University Campus Bio-Medico of Rome, Italy); Gaia Caligiore, Concetto Spampinato, Sabina Fontana, Simone Palazzo and Egidio Ragonese (University of Catania, Italy)

16:30 - 18:10 *Room A0.2*

Technical Session 8 - Track 4.2 - AI Applications for Industry (sponsored by CE Italy Chapter and Tem Italy Chapter)

Chair: Flavio Piccoli, *University of Milano-Bicocca, Italy*

16:30 **Efficient Deep Learning Methods for Food Localization in Canteen Trays**

Flavio Piccoli, Marco Buzzelli, Davide Marelli, Simone Bianco, Gianluigi Ciocca and Raimondo Schettini (University of Milano-Bicocca, Italy)

16:50 **AI-Enhanced AUTOSAR Configuration Efficient Methods for Dataset Generation and Automated Code Production**

Ahmed Essam Salem, Nada Ayman El-Gnainy, Mira Shanouda, Anas Abdallah Ibrahim, John William, Mariam Elsharkawy and Passant Moustafa (The American University in Cairo, Egypt); Mohamed Al Ansary and Hossam Mahmoud (Siemens Digital Industries Software, Egypt); Ahmed Moro (Siemens Digital Industries Software, Integrated Electrical Systems Segment, Egypt); Cherif R. Salama (The American University in Cairo & Ain Shams University, Egypt)

17:10 **An Expert System for Managing the Render Farms in Cloud Data Centers**
Auday Al-Dulaimy (Mälardalen University, Sweden); Karam Turki (Gilgamesh Studio, Jordan); Thomas Nolte and Alessandro V. Papadopoulos (Mälardalen University, Sweden)

17:30 **Full-Scale Output Adjustment of CSTR by Feedforward and Feedback Controllers**
Ali M. Almohammedi (King Fahd University of Petroleum and Minerals & King Fahd International Airport, Saudi Arabia); Mohammad A. Abido (KFUPM, Saudi Arabia)

17:50 **Mapping Music Onto Robot Joints for Autonomous Choreographies: PCA-Based Approach**
Giuseppe Saviano (University of Pisa, Italy); Alberto Villani and Domenico Prattichizzo (University of Siena, Italy)

19:30 - 21:00 *Ristorante Frigerio*
WELCOME RECEPTION

Technical Program - Thursday, September 19

08:30 - 17:00 — *Politecnico di Milano - Polo Territoriale di Lecco*
REGISTRATIONS

08:30 - 10:30 — *Room A1.1*
Technical Session 9 - Track 1.3 - Methods and Technologies for AI (sponsored sponsored by CAS-C&S Italy Chapter)
Chair: Daniele Linaro, *Politecnico di Milano*

8:30 **β-Quaternion Centralized Fusion Estimation Problem Under First-Order Properness Conditions**
José Domingo Jiménez-López, Rosa M. Fernández-Alcalá, J. Navarro-Moreno and Ruiz-Molina (University of Jaén, Spain); Eleonora Grassucci and Danilo Comminiello (Sapienza University of Rome, Italy)

8:50 **Equivalent Circuit of Electrothermal Memristor Model Based on HfO2**
Khitem Lahbacha and Antonio Maffucci (University of Cassino and Southern Lazio, Italy)

9:10 **Optimizing Partner Selection for Cooperative Solar Generation Forecasting**
Lejla Pašić, Azra Pašić, Alija Pašić and Jozsef Biro (Budapest University of Technology and Economics, Hungary)

9:30 **Ground-Based Contrail Detection by Means of Computer Vision Models: A Comparison Between Visible and Infrared Images**
Paolo Pertino (Politecnico di Milano, Italy); Enrico Miotto and Leonardo Pavarino (Politecnico di Torino, Italy); Simone Lomolino (Politecnico di Milano, Italy); Daniele Rege Cambrin and Paolo Garza (Politecnico di Torino, Italy); Emanuele Ogliari (Politecnico di Milano, Italy)

9:50 **PHemoNet: A Multimodal Network for Physiological Signals**
Eleonora Lopez, Aurelio Uncini, Danilo Comminiello (Sapienza University of Rome, Italy)

08:30 - 09:50 — *Room B0.7*
Technical Session 10 - Track 2.3 - AI Applications to Energy and Transportation Systems (sponsored by ITS Italy Chapter and VTS Italy Chapter)
Chairs: Fredy Ruiz, *Politecnico di Milano, Italy*
Marzio Barresi, *Politecnico di Milano, Italy*

8:30 **[INVITED] Optimal Charging and Speed Control of Electric Automated Buses in Intercity Lines**
Silvia Siri (University of Genova, Italy)

8:50 **Analysis of Driving Behaviour Under Different Disturbance Conditions Through Virtual Reality**

Andrea Di Martino and Michela Longo (Politecnico di Milano, Italy); Wahiba Yaici (Natural Resources Canada, Canada)

9:10 **Evaluating the V2X Latency for Vehicle Positioning: A Comparison Between 5G-V2X and ITS-G5**
Raffaele Viterbo, Mattia Brambilla, Mattia Cerutti and Simone Specchia (Politecnico di Milano, Italy); Diego Franceschini and Benedetto Carambia (Movyon SpA, Italy); Sergio Savaresi and Monica Nicoli (Politecnico di Milano, Italy)

9:30 **Real-Time Rule-Based Algorithm for Track Detection of Tram-Train**
Jihyeon Baek (Sungkyunkwan University); Jae-Ho Kwak, Hyeon-Chyeol Hwang, Heegyun Jeon, SungWon Park and Hyunsuk Lee (Korea Railroad Research Institute, Korea (South)); Tae Yong Kuc (Sungkyunkwan University, Korea (South))

9:50 **Joint Occupancy and Load Profile Prediction for Electric Vehicle Charging Stations**
Yuksel Utku Koruturk, Cesar Diaz-Londono and Fredy Ruiz (Politecnico di Milano, Italy)

10:10 **Private Company Decarbonization: A Methodology for Renewable Integrated Full-Electric Fleet**
Cristian Giovanni Colombo, Michela Longo, Seyedmahdi Miraftabzadeh and Dario Zaninelli (Politecnico di Milano, Italy)

08:30 - 10:10 *Room B0.1*
Technical Session 11 - Track 3.3 - AI Applications to Health and Smart Living (sponsored by SMC Italy Chapter and CS Italy Chapter)
Chair: Maide Bucolo, *University of Catania, Italy*

8:30 **AI-Based Acoustic Surveillance System for Smart Cities**
Jan Holub and Jakub Svatos (Czech Technical University in Prague, Czech Republic)

8:50 **SAALUS: Smart Ambient Assisted Living Ubiquitous System**
Gaetano Pagano (ICS Maugeri SB of Bari, Italy); Federico Colelli Riano (Istituti Clinici Scientifici Maugeri IRCCS, Laboratory of Bioengineering, Italy); Giovanni Iaselli (Bioengineering Unit Istituti Clinici Scientifici Maugeri IRCCS Pavia, Italy); Alberto Malovini and Matteo Terzaghi (Laboratory of Medical Informatics ICS Maugeri IRCCS Pavia, Italy); Giovanni D'Addio (S. Maugeri Foundation, Rehabilitation Institute of Telese, Italy)

9:10 **Utilizing Business Intelligence Software to Track Key Performance Indicators (KPIs) for Assessing the Computerized Maintenance Management System (CMMS)**
Paola Picozzi (Politecnico di Milano, Italy); Veronica Cimolin (Politecnico di Milano & IRCCS Istituto Auxologico Italiano, Italy); Umberto Nocco (Clinical Engineering Department of ASST Grande Ospedale Metropolitano Niguarda, Italy); Andrea Pezzillo and Adriana De Cosmo (Politecnico di Milano, Italy)

9:30 **Supervised and Unsupervised Soft Sensors for Capsule Recognition in Espresso Coffee Machines**
Nicolas Tortora (Italy); Antonio De Moliner (Zoppas Industries, Italy); Francesco Borsatti, Roberto Oboe and Gian Antonio Susto (University of Padova, Italy)

08:50 - 10:30 — *Room A0.2*

WORKSHOP ON HUMANOID ROBOTICS GO UBIQUITOUS! INDUSTRIES AND RESEARCHERS AS THE KEY ENABLERS - PART 1 (sponsored by RA Italy Chapter)

08:50 **Welcome to participants**
Danilo Pau (*ST*) and Tiziana Tambosso (*R8 CoCC Chair*)

09:00 **Humanoid Robots: Challenges and Perspective in Automation**
Fabio Ruggiero (*Italy Section RAS Chapter Chair*)

09:15 **A predictive approach for Maintenance and Safety of a wheeled humanoid robot**
Fabio Puglia (*CEO – Oversonic Robotics*)

09:30 **Humanoid robots that learn: challenges and applications**
Lorenzo Natale (*Italian Institute of Technology*)

09:45 **Advancements in high performance humanoid robot functionalities**
Luca Marchionni (*CTO – PAL Robotics*)

10:00 **What Does a Robot Need to Be Human? The Journey of Abel**
Lorenzo Cominelli (*University of Pisa*)

10:15 **Thrustable autonomy for efficient and safe deliberation**
Marco Roveri (*University of Trento*)

10:30 - 11:00 — *Politecnico di Milano - Polo Territoriale di Lecco*

COFFEE BREAK

11:00 - 13:00 — *Room A0.1*

[ITA] IA: Macchine servizi e comunicazione reputazionale
Conduce e modera: Immacolata Tina, *Responsabile U.O. Innovazione e Digitalizzazione e PID, Camera di Commercio di Como-Lecco*

AI e manifatturiero: ruolo di accademia e associazioni di standardizzazione per lo sviluppo dell'AI
Giambattista Gruosso, *Politecnico Di Milano – Vice Chair di IEEE Italia*

Presentazione Position Paper su AI nel manifatturiero
Oronzo Lucia, *Coordinatore Comitato Scientifico SPS*

Sfide dell'impiego dell'AI nelle Macchine automatiche
Giacomo Corti, *Divisione Elettronica OMET*

Regolamentazione etica, Policy, Comunicazione reputazionale
Beatrice Camilla Pirovano, *Partner di Legnani Legal*

Testimonianza aziendale
Alice Ruscitto, *Responsabile IT F.lli Mauri SPA*

11:00 - 13:20 *Room A1.1*

Technical Session 12- Special Session 3 - AI for microscopy, imaging and bio-data analytics (sponsored by I&M Italy Chapter)

Chairs: Pietro Ferraro, *National Research Council, Italy*
Pasquale Memmolo, *National Research Council, Italy*

11:00 **Physically Inspired Scattering Correction for Non-Linear Excitation Imaging of Tissues**
Davide Panzeri, Mario Marini, Luca Presotto, Laura Sironi, Maddalena Collini and Giuseppe Chirico (University Milano-Bicocca, Italy)

11:20 **Open-Set Based Single Cell Identification in Microfluidics**
David Dannhauser and Filippo Causa (University of Naples, Italy); Paolo Netti (Center for Advanced Biomaterials Fore Health Care @CRIB, IIT Napoli, Italy)

11:40 **Label-Free Nervous System Single Cell Classification Using Pretrained VGG and ResNet Networks**
Pierpaolo Fiore, Francesco Bardozzo, Roberto Tagliaferri (University of Salerno, Italy)

12:00 **Strategies of T-Cells Identification in AI-Powered Quantitative Phase Imaging Flow Cytometry**
Daniele Pirone (CNR-ISASI, Italy); Beatrice Cavina (University of Bologna, Italy); Martina Mugnano (DICMAPI UNINA, Italy); Vittorio Bianco and Lisa Miccio (CNR-ISASI, Italy); Anna Myriam Perrone, Anna Maria Porcelli and Giuseppe Gasparre, Ivana Kurelac (University of Bologna, Italy); Pasquale Memmolo (CNR-ISASI, Italy)

12:20 **Towards a Deep Learning Approach to Discriminate Hereditary Anemias**
Francesco C Morabito, Cosimo Ieracitano and Nadia Mammone (University Mediterranea of Reggio Calabria, Italy); Marika Valentino (Istituto di Scienze Applicate e Sistemi Intelligenti ISASI-CNR, Italy); Zhe Wang (Institute of Applied Sciences and Intelligent Systems (CNR), Italy); Michela Schiavo (Institute of Applied Sciences and Intelligent Systems (CNR-ISASI), Italy); Vittorio Bianco (CNR-ISASI, Italy); Anthony Iscaro, Antonella Nostroso and Immacolata Andolfo (University of Naples Federico II, Italy); Roberta Russo (University of Naples Federico II, Naples, Italy); Lisa Miccio (CNR-ISASI, Italy)

12:40 **A Deep Learning Approach for the Automatic Video Classification of Silicone Oil Droplet Deformation Induced by Electrohydrodynamic Effect**
Cosimo Ieracitano (University Mediterranea of Reggio Calabria, Italy); Daniele Tammaro (University of Naples Federico II, Italy); Nadia Mammone (University Mediterranea of Reggio Calabria, Italy); Volodymyr Tkachenko (ISASI-CNR, Italy); Sara Coppola and Veronica Vespini (CNR-ISASI, Italy); Pietro Ferraro (ISASI CNR, Italy); Simonetta Grilli (Institute of Applied Sciences and Intelligent Systems (ISASI), CNR, Italy); Francesco C Morabito (University Mediterranea of Reggio Calabria, Italy); Pier Luca Maffettone (University of Naples Federico II, Italy)

13:00 **KBNet-Based Noise Suppression in Edge Illumination X-Ray Phase Contrast Imaging**
Neam Halat, Domenico Iuso, Jan Sijbers and Jan De Beenhouwer (University of Antwerp, Belgium)

11:00 - 13:00 *Room B0.7*

Technical Session 13 - Special Session 7 - AI and ICT to support robotic rehabilitation - the activity 7 of fit4med project

Chairs: Riccardo Bellazzi, *University of Pavia, Italy*
Stefano Ramat, *University of Pavia, Italy*

11:00 **Extended Reality and Artificial Intelligence for Exergaming: Opportunities and Open Challenges for Rehabilitation and Cognitive Training**
Manuela Chessa, Lorenzo Gerini, Razeen Hussain, Matteo Martini and Marianna Pizzo (University of Genoa, Italy); Fabio Solari (Via Dodecaneso 35, Italy); Eros Viola (University of Genoa, Italy)

11:20 **Telemedicine and AI: From Co-Design to Explainability**
Silvia Filogna (IRCCS Fondazione Stella Maris, Italy); Alessio Malizia, Daniele Mazzei, Giuseppe Prencipe, Giuseppina Sgandurra and Tommaso Turchi (Università di Pisa, Italy)

11:40 **Developing a Prototype Healthcare Data Platform for Advanced Analytics in Rehabilitation Environments**
Antonio Foschi, Domenico Pistilli, Gaia Bondani and Fabio Rebecchi (Eustema, Italy)

12:00 **Systematic Comparison of Machine Learning for Activity Recognition in Cross-Subject vs. NonCross-Subject Scenarios: A Preliminary Analysis**
Samuele Pe, Giovanna Nicora, Bruna Guerra, Stefania Sozzi and Enea Parimbelli (University of Pavia, Italy)

12:20 **AI Processing of Wearable IMU Data for Exoskeleton Gait Analysis**
Bruna Guerra and Stefania Sozzi (University of Pavia, Italy); Serena Pizzocaro (LUNEX International University of Health, Exercise and Sports, Luxembourg); Alessandro Marco De Nunzio (LUNEX International University of Health, Exercise and Sports Luxembourg, Luxembourg); Micaela Schmid (University of Pavia, Italy)

12:40 **Challenges in Implementing ICT Rehabilitation Environments in Real Clinical Practice**
Valentina Tibollo (Istituti Clinici Scientifici Maugeri IRCCS, Italy); Lucia Sacchi (University of Pavia, Italy); Alberto Malovini (Laboratory of Medical Informatics ICS Maugeri IRCCS Pavia, Italy); Anna Giardini (Istituti Clinici Scientifici Maugeri IRCCS Pavia, Italy); Giovanni D'Addio (S. Maugeri Foundation, Rehabilitation Institute of Telese, Italy); Christian Lunetta (Istituti Clinici Scientifici Maugeri IRCCS Pavia, Italy)

11:00 - 13:00 *Room B0.1*

Technical Session 14 - Special Session 11 - Artificial Intelligence in Medical Applications

Chairs: Sabatina Criscuolo, *University of Naples Federico II, Italy*
Daniele Spoladore, *National Research Council, Italy*

11:00 **Revolutionizing Emergency Care: How Telemedicine is Addressing Non-Urgent Calls and Medic Shortages in Italy**
Sarah Behnam and Marco Sacco (Italian National Research Council, Italy)

11:20 **Explainable AI Assessment of Meal-Related Features Impact in Predicting Basal Insulin for Type I Diabetes**

Giovanni Annuzzi, Pasquale Arpaia, Lutgarda Bozzetto, Sabatina Criscuolo, Egidio De Benedetto and Marisa Pesola (University of Naples Federico II, Italy)

11:40 **A Cognitive Computing Tool for Identification and Classification of Brain Tumors**
Camilla Russo, Paolo Maresca, Alfredo Marinelli (University of Naples Federico II, Italy)

12:00 **The "Medical Exception" to Emotion Detection Algorithms Within the EU's Forthcoming AI Act: Regulatory Implications for Therapeutical Smart Cobotics**
Riccardo Vecellio Segate (University of Groningen & University of Dundee, The Netherlands)

12:20 **Exploring the Latent Space of Person-Specific Convolutional Autoencoders for Eye-Blink Artefact Mitigation in EEG Signals**
Sabatina Criscuolo, Salvatore Giugliano and Andrea Apicella (University of Naples Federico II, Italy); Francesco Donnarumma (National Research Council, Italy); Francesco Amato and Annarita Tedesco (University of Naples, Federico II, Italy); Luca Longo (Technological University Dublin, Ireland)

12:40 **Unveiling Trustworthy AI Challenges: Characterizing Prediction Reliability**
Isotta Trescato, Alessandro Guazzo, Enrico Longato, Erica Tavazzi and Martina Vettoretti (University of Padova, Italy); Umberto Manera and Adriano Chiò (University of Turin, Italy); Marta Gromicho, Inês Alves and Mamede De Carvalho (Instituto de Medicina Molecular João Lobo Antunes, Universidade de Lisboa, Italy); Barbara Di Camillo (University of Padova, Italy)

11:00 - 12:30 *Room A0.2*
WORKSHOP ON HUMANOID ROBOTICS GO UBIQUITOUS! INDUSTRIES AND RESEARCHERS AS THE KEY ENABLERS - PART 2

11:00 **Enhancing Humanoid Robot Autonomy: An ISPU-Based Approach to Fall Detection and Prevention**
Giuseppe Messina (*System Research – STMicroelectronics*)

11:15 **High density power controllers for Robotics**
Giulio Ricotti (*Design Director – STMicroelectronics*)

11:30 **Industrial IMUs to monitor robotic applications**
Marco Bianco (*MEMS Software Solutions Manager – STMicroelectronics*)

11:45 **Langbotics – Let Robotic Agents Reason About the World**
Simone Voto (*Reply Concept*)

12:00 **Exploring the Role of 6G Technology in Robotics Applications**
Mona Ghassemian (*Huawei*)

12:15 **Q&A & Round Table**
Moderators: Danilo Pau, Fabio Ruggiero

13:00 - 14:00 *Politecnico di Milano - Polo Territoriale di Lecco*
LUNCH

14:00 - 16:00 *Room A0.1*
WORKSHOP ON INNOVATIVE STARTUPS AND ENTREPRENEURSHIP

14:00 **Welcome to participants**
Tiziana Tambosso - *IEEE Italy Section Entrepreneurship Committee*
Sergio Rapuano - *University of Sannio, IEEE R8 CoCC*

14:10 **How can IEEE future directions help your start up?**
Christine Miyachi - *Software Engineering Manager @Microsoft, IEEE Future Direction Committee*

14:30 **IEEE Entrepreneurship - at the forefront of turning ideas into successful businesses**
Joanne Wong - *General Partner of REDDS Capital and IEEE Entrepreneurship chair*

14:45 **IEEE R8 programs to support entrepreneurships**
Marco Giordani - *University of Padova and IEEE R8 Entrepreneurship Committee*
Rawan el-Jamal - *Mastercard Europe and IEEE R8 Entrepreneurship Committee Chair*

15:00 **Ethical Artificial Intelligence: impact of ethics in development and adoption of AI technologies**
Ali Hessami - *IEEE P7000 standard Chair*

15:20 **From Invention to Innovation: how to create a startup transforming great technologies into real products**
Enrico Deluchi - *Entrepreneur/startup Advisor/Business Angel*

15:40 **Venture Capital for early stage Deep tech companies**
Roberto della Marina - *Founder and Managing Partner of Obloo Ventures and Venture Factory*

14:00 - 15:20 *Room A1.1*
Technical Session 15.1- Special Session 4 - Telecommunications Solutions for Next-Generation Industrial IoT (NG-IIoT)
Chairs: Luciano Miuccio, *University of Catania, Italy*
Enrico Testi, *University of Bologna, Italy*

14:00 **A Flexible Scheme for Critical mMTC**
Alessandro Mirri and Diego Forlivesi (University of Bologna, Italy); Riccardo Schiavone and Roberto Garello (Politecnico di Torino, Italy); Marco Chiani and Enrico Paolini (University of Bologna, Italy)

14:20 **Blind User Activity Detection for Grant-Free Random Access in Cell-Free mMIMO Networks**
Muhammad Usman Khan, Enrico Testi, Marco Chiani and Enrico Paolini (University of Bologna, Italy)

14:40 **Designing a Broker Extension for Seamless CoAP and MQTT Interoperability**
Corrado Innamorati, Alessandro E. C. Redondi and Matteo Cesana (Politecnico di Milano, Italy)

15:00 **DNN Hardware Accelerator Selection for Feasible Deployment of MARL-Based MAC Protocols in Industrial IoT Networks**
Enrico Russo, Elio Vinciguerra, Giuseppe Ascia and Daniela Panno (University of Catania, Italy)

14:00 - 15:00 *Room B0.7*

Technical Session 16.1 - Special Session 5 - Techniques AI-based for Innovative High Frequency Power Converters: Analysis of Architectures, Components, Controllers and Materials

Chairs: Fabio Corti, *University of Florence, Italy*
Vittorio Bertolini, *University of Perugia, Italy*

14:00 **Prediction of DC/DC Boost Converter Switching Power Losses Using a Backpropagation Algorithm Neural Network**
Michele Quercio and Lorenzo Sabino (Università Degli Studi Roma Tre, Italy); Gabriele Maria Lozito (University of Florence, Italy); Rafiq Asghar (Roma Tre University, Italy); Mauro Parise (Università Campus Bio-Medico di Roma, Italy); Francesco Riganti Fulginei (Roma TRE University, Italy)

14:20 **Foreign Object Detection for Wireless Power Transfer Systems Using MLMVN**
Marco Bindi (University of Florence, Italy); Vipinkumar Shriram Meshram (University of Campania Luigi Vanvitelli, Italy); Antonio Luchetta, Lorenzo Becchi and Matteo Intravaia (University of Florence, Italy); Alicia Triviño and Eliseo Villagrasa (University of Malaga, Spain)

14:40 **A Neural Network Based Control Strategy for Constant Current Battery Chargers With PV Source**
Lorenzo Becchi, Marco Bindi, Cristian Garzon Alfonso, Matteo Intravaia, Gabriele Maria Lozito and Francesco Grasso (University of Florence, Italy)

14:00 - 15:20 *Room B0.1*

Technical Session 17.1 - Special Session 12 - Simulation, co-simulation and digital twins for CCAM: AI opportunities and challenges

Chair: Roberta Di Pace, *University of Salerno, Italy*
Luca Di Costanzo**,** *University of Naples Federico II, Italy*

14:00 **An Artificial Intelligence Approach for Automated Asset Management of Railway Systems**
Luca Di Costanzo, Angelo Coppola and Stefano Marrone (University of Naples Federico II, Italy)

14:20 **Leveraging AI Techniques to Understand and Simulate Driving Behaviours**
Angelo Coppola and Amir Reza Safari (University of Naples Federico II, Italy)

14:40 **Machine Learning-Based Method for Energy Economy Driver Assistance**
Hao Chen, Shailesh Hegde, Angelo Bonfitto and Nicola Amati (Politecnico di Torino, Italy)

15:00 **Enhancing Safety by Obstacle Detection at Railway Level Crossings**
Alessia Saggese (University of Salerno, Italy); Vincenzo Carletti (Unviersity of Salerno, Italy); Antonio Greco (University of Salerno, Italy); Bruno Vento (AITECH, Italy)

14:00 - 16:00 *Room A0.2*

ROUND TABLE - AI enabler for the manufacturing: challenges, success stories and future trends (sponsored by SPS and TEM Italy Chapter)

Chair: Sergio Terzi, *Politecnico di Milano*

Round Table with:

Leveraging AI in Industrial Production: Practical Use Case
Nadia Scandelli, *Head of Smart Industry Solutions Unit Cefriel*

AI in Advanced Robotics Products: overview and application use cases
Gianpiero Negri, *Global Head of Central Quality Assurance and Field Compliance Amazon Mechatronics and Sustainable Packaging (member of scientific committee of SPS italia)*

AI in advanced production: challenges and use cases
Fabio Vesperini, *Phd, Head of data Science – 40Factory*

Connecting Skills: Open Innovation and Design Thinking for an Ethical and Productive AI
Oronzo Lucia, *Scientific Coordinator of Scientific Committee of SPS Italia*
Stefano Faccio, *Head of Machinery Safety, Industry 4.0 & Digital Manufacturing Marelli Automotive Lighting (member of scientific committee of SPS italia)*
Federico Milan, *Digital Innovation Manager Breton - (member of scientific committee of SPS italia)*

16:00 - 16:30 *Politecnico di Milano - Polo Territoriale di Lecco*
COFFEE BREAK

16:00 - 18:15 *Room A0.1*
WORKSHOP ON INNOVATIVE STARTUPS AND ENTREPRENEURSHIP

16:30 **EIC Accelerator: state of the art and a look to the future**
Alessia Rotolo - *APRE - Agency for the Promotion of the European Research*

16:45 **Intellectual property and legal design for innovative startups**
Anna De Stefano - *Angel Investor & Startup Advisor Legal Design Expert*

17:00 **Students and entrepreneurship - the Polimi experience**
Alexandra Dumitrache - *Entrepreneurship Club Polimi*

17:15 **Q&A & Round Table**
Moderator: Tiziana Tambosso and Sergio Rapuano

16:30 - 17:30 *Room A1.1*
Technical Session 15.2- Special Session 4 - Telecommunications Solutions for Next-Generation Industrial IoT (NG-IIoT)
Chairs: Salvatore Riolo, *University of Catania, Italy*
Enrico Testi, *University of Bologna, Italy*

16:30 **Guidelines for RIS Planning in IIoT Scenarios**
Alessia Tarozzi, Enrico M. Vitucci, Franco Fuschini and Roberto Verdone (University of Bologna, Italy)

16:50 **IN-Rep: A New Open Data Repository for AI-Based Positioning in Industrial Networks**
Nadir Bouzar, Luca De Nardis and Maria Gabriella Di Benedetto (Sapienza University of Rome, Italy); Enrico M. Vitucci and Marco Chiani (University of Bologna, Italy); Stefano Caputo and Lorenzo Mucchi (University of Florence, Italy)

17:10 **Impact of Rain on Frequency Bands in 4G/5G Networks: Implications for Industrial Connectivity**
Roberta Avanzato, Francesco Beritelli and Maria Grazia Borzì (University of Catania, Italy)

16:30 - 17:30 *Room B0.7*
Technical Session 16.2 - Special Session 5 - Techniques AI-based for Innovative High Frequency Power Converters: Analysis of Architectures, Components, Controllers and Materials
Chairs: Fabio Corti, *University of Florence, Italy*
Vittorio Bertolini, *University of Perugia, Italy*

16:30 **Advancements in Artificial Intelligence for Design, Control, and Maintenance of Power Electronics: A Comprehensive Review**
Vipinkumar Shriram Meshram (University of Campania Luigi Vanvitelli, Italy); Cristian Garzon Alfonso, Lorenzo Becchi, Alberto Reatti, Francesco Grasso and Libero Paolucci (University of Florence, Italy)

16:50 **Duty Cycle Control for a Series-Series Compensated Wireless DC-DC Converter Using a Hybrid Controller**
Vittorio Bertolini (Università degli Studi di Perugia, Italy); Marco Stella (University of Perugia, Italy); Riccardo Scorretti (University of Perugia, Italy & CNRS, France); Antonio Faba and Ermanno Cardelli (University of Perugia, Italy)

17:10 **Comparison of Control Strategies Performances Based on a PID Controller and on an ANN Controller to Stabilize a Misaligned Wireless Resonant Converter**
Marco Stella (University of Perugia, Italy); Riccardo Scorretti (University of Perugia, Italy & CNRS, France); Antonio Faba and Ermanno Cardelli (University of Perugia, Italy)

16:30 - 18:00 *Room B0.1*
Technical Session 17.2 - Special Session 12 - Simulation, co-simulation and digital twins for CCAM: AI opportunities and challenges
Chairs: Roberta Di Pace, *University of Salerno, Italy*
Luca Di Costanzo**,** *University of Naples Federico II, Italy*

16:30 **Combining Deep Networks With Model-Based Scene Segmentation for Reliably Detecting Rocks on Railway Tracks**
Vincenzo Carletti (Unviersity of Salerno, Italy); Pasquale Foggia, Speranza Ranieri, Alessia Saggese and Camilla Spingola (University of Salerno, Italy); Mario Vento (Universita' di Salerno, Italy)

16:50 **Application of Quantum Genetic Algorithms to Connected and Electric Vehicles Energy Consumption Optimization**
Giovanni Acampora (University of Naples Federico II & Istituto Nazionale di Fisica Nucleare, Italy); Angela Chiatto (University of Naples Federico II, Italy); Stefano de Luca, Roberta Di Pace and Chiara Fiori (University of Salerno, Italy); Enrico Landolfi (Netcom Engineering, Italy); Alfredo Massa (QuantumNet Srl, Italy); Roberto Schiattarella and Autilia Vitiello (University of Naples Federico II, Italy)

17:10 **Realization of the Penetration Rate of Automated Driving System-Equipped Vehicles in the Presence of CCAM Enabled New Mobility Services**
Muhammad Tabish Bilal, Angela Di Febbraro, Davide Giglio and Nicola Sacco (University of Genoa, Italy)

19:30 - 23:00	*Griso Panorama Restaurant* **CONFERENCE DINNER**

Technical Program - Friday, September 20

08:30 - 12:00 *Politecnico di Milano - Polo Territoriale di Lecco*
REGISTRATIONS

08:30 - 10:10 *Room A1.1*
Technical Session 18 - Track 4.3 - AI Applications for Industry (sponsored by CE Italy Chapter and CS Italy Chapter)
Chair: Stefano Dettori, *Scuola Superiore Sant'Anna, Italy*

8:30 **Automatic Surveillance of Accelerated Cooling Line Against Cyber-Attacks and Faults**
Stefano Dettori and Vincenzo Iannino (Scuola Superiore Sant'Anna, Italy); Lorenzo Vannini (Scuola Superiore Sant Anna, Italy); Valentina Colla (Scuola Superiore Sant'Anna, Italy); Francesco Ferraris (Prisma Impianti S.P.A., Italy)

8:50 **Strengthening Applications' Security With Handwritten Arabic Calligraphy Captcha**
Hela Lajmi (Research Group on Intelligent Machines in ENIS sfax, Tunisia); Faiza Idoudi and hasna njah (University of Gabes, Tunisia); Habib M. Kammoun (University of Sfax & REGIM-Lab., Tunisia); Ines Njeh (National School of engineer of sfax, Tunisia)

9:10 **Privacy-Preserving Detection of Helmet and Mask Wearing With Fully Homomorphic Encryption: Towards A Secure Inference Approach**
Jia-Lin Chan, Wun-She Yap and Denis Chee-Keong Wong (Universiti Tunku Abdul Rahman, Malaysia); Bok-Min Goi (Universiti Tunku Abdul Rahman (UTAR), Malaysia); Wai Kong Lee (Universiti Tunku Abdul Rahman, Malaysia)

9:30 **Hidden in Plain Sight: Adversarial Attack on Wavelet-Based Banknote Authentication**
Julian Knaup (Institute Industrial IT & Technische Hochschule Ostwestfalen-Lippe, Germany); Christoph-Alexander Holst (Institute Industrial IT (inIT), Germany); Volker Lohweg (Technische Hochschule Ostwestfalen-Lippe, Germany)

9:50 **Monitoring Data Streams in Industry 5.0: A Knowledge Graph Approach**
Monica Marconi Sciarroni, Marco Esposito, Paola Pierleoni, Emanuele Storti (Università Politecnica Delle Marche, Italy)

08:30 - 10:30 *Room B0.4*
Technical Session 19 - Track 4.4 - AI Applications for Industry (sponsored by IES and IES/IAS/PELS Italy Chapter)
Chair: Simone Bianco, *University of Milano Bicocca, Italy*

8:30 **Predictive Maintenance for Filling Machines With Online Evolving Spiking Neural Networks**
Valentina Tessoni (Sidel & University of Parma, Italy); Michele Amoretti (University of Parma, Italy); Michele Ollari (Sidel, Italy)

8:50 **Predictive Maintenance of Marine Engines Using a Long Short-Term Memory Algorithm**

Francesco Maione, Paolo Lino and Guido Maione (Politecnico di Bari, Italy); Giuseppe Giannino (Isotta Fraschini Motori Spa, Italy)

9:10 **Using Neural Networks With Linear Regression as a Scalable Model to Predict the Behaviour of Pumps**
Benjamin Peric (Hochschule Furtwangen, Germany)

9:30 **Milk-Run Optimization Under Time Windows for Collection and Replacement of Low-Charge e-Scooters**
Esra Çakır (Galatasaray University, Turkey)

9:50 **Interpretable Data-Driven Anomaly Detection in Industrial Processes With ExIFFI**
Davide Frizzo (University of Padova, Italy); Francesco Borsatti (University of Padua, Italy); Alessio Arcudi (University of Padova, Italy); Antonio De Moliner (Zoppas Industries, Italy); Roberto Oboe and Gian Antonio Susto (University of Padova, Italy)

10:10 **Efficient Deep Learning Models for Litter Detection in the Wild**
Simone Bianco, Elia Gaviraghi and Raimondo Schettini (University of Milano-Bicocca, Italy)

08:30 - 10:30 *Room B0.1*
IEEE Young Professionals Event and Award (sponsored by IEEE YP R8 and IEEE YP Italy Section)

08:30 - 09:15 **Presentations and discussions on YP activities**
R8 YP and IEEE Italy Section YP: chaired by Aly Alfaily and Santi Concetto Pavone

09:15 - 10:30 **YP Pitch Competition organized by the IEEE YP Italy Affinity Group (Santi Concetto Pavone, Martina Teresa Bevacqua, Michele Ambrosanio and Vincenzo Randazzo).**
Chaired by: Santi Concetto Pavone, Aly Alfaily and Cosimo Ieracitano.

Pietro Balatti, Luca Fortini, Mattia Leonori, Arash Ajoudani
Real-Move: effortless tracking, markerless motion

Stefano Franceschini
A Novel Ultrasound Device for Contactless Quantitative Finger Tapping Monitoring

Faizullin Adil, Biloshchytskyi Andrii, Biloshchytskaya Svitlana, Toxanov Sapar, Neftisov Alexander
Development of precision farming information technology for agricultural management using the Internet of Things

Sanjay Ghosh, Ruturaj G. Gavaskar, Debasisha Panda, Kunal N. Chaudhury
Fast Scale-Adaptive Bilateral Texture Smoothing

Faizullin Adil, Omirbayev Serik, Mukhatayev Aidos, Kassenov Khanat
Development of information and educational system "Quality management of higher and postgraduate education"

Leopoldo Angrisani, Pasquale Arpaia, Sabatina Criscuolo, Egidio De Benedetto, Luigi Duraccio
Metrology-based methodology for enhancing Artificial Intelligence trustworthiness

Anil Osman Tur, Nicola Dall'Asen, Cigdem Beyan, Elisa Ricci
Unsupervised Video Anomaly Detection using Diffusion Models Conditioned on Compact Motion Representations

Luca Perbellini, Samuele Grillo, Matteo Bau
Neural Network models for a fast solution of optimal power flow problems: current state and perspectives

Giorgia Ghione, Vincenzo Randazzo, Giansalvo Cirrincione, Marco Badami, Eros Pasero
Enhancing Industrial Energy Management through Innovative Deep Learning Techniques

Muhammad Mohsin, Stefano Rovetta, Francesco Masulli, Alberto Cabri
Advanced Circular Economy Practices for Efficient Recovery of Critical Raw Materials from Waste Printed Circuit Boards

Esra Çakir
Evaluating micromobility alternatives using novel MCDM approaches

Khadeejah Abdullah, Kassem Saleh, Paul Manuel
Blockchain Adoption in Education with Enhancing Data Privacy

09:00 - 10:30 *Room A0.2*
Panel IEEE WiE - The advantages derived from female presence in working realities (sponsored by WIE Italy Section and Wie IEEE R8)

09:00 **Welcome and opening session**
Patrizia LAMBERTI, WIE AG IEEE Italy Section Chair, University of Salerno, Italy
Giambattista GRUOSSO, Conference General Chair, Polytechnic of Milan, Italy
Efthymia Koutsiana ARVANITI, WIE Region 8, HILTI- Liechtenstein and Switzerland Global IT Project Manager

09:05 **IEEE WIE Region 8 Activities presentation**
Efthymia Koutsiana ARVANITI, WIE International

09:10 **IEEE Diversity and inclusion activities presentation**
Dajana Cassioli, IEEE Italy Section Diversity Equity and Inclusion Activities Coordinator

09:15 **Commitment chart 3.0 by WIE AG**
Patrizia Lamberti, WIE AG IEEE Italy Section Chair

09:20 **My experience as a female in academia and as a Swiss government employ**
Maria-Alexandra Paun, Telecommunication Engineer

09:35 **My experience as founder of a private-based small company**
Immacolata Tortora, CEO of ATE-Automazione srl

09:50 **The Sew-Eurodrive experience**
Luisa Apicella, Application Engineering Consultant

10:05 **The Emerson experience**

10:20 **Discussion and conclusions**

10:30 - 11:00 *Politecnico di Milano - Polo Territoriale di Lecco*
COFFEE BREAK

11:00 - 12:30 *Room A0.1*
WORKSHOP - THE ROLE OF AI IN CLINICAL ENGINEERING (sponsored by EMB Italy Chapter)
Chair: Anna Maria Bianchi, Politecnico di Milano e Umberto Nocco, *AIIC*

The role of innovation in medical technologies
Ing Umberto Nocco, *Chair of AIIC (Associazione Italiana Ingegneri Clinici)*

Artificial Intelligence in biomedical technologies: the role of the Clinical Engineering Service
Ing Serena Vecchi, Ing. Ferruccio Panzica, *IRCCS Neurological Institute C. Besta of Milan*

Artificial Intelligence supporting the Clinical Engineer: automated planning of the equipment maintenance and/or replacement in the hospital
Ing. Silvio Cravero, *ASST Fatebenefratelli - Sacco*

Medical Devices with Artificial Intelligence between MDR and AI-Act
Ing. Stefano Bergamasco, *Medtech Projects e Direttore Centro Studi AIIC*

Ethical Implications of AI in Biomedical Health Technologies
Sergio Cerutti, *Emeritus Professor, Department of Electronics, Information and Bioengineering, Politecnico di Milano*

11:00 - 12:40 *Room A1.1*
Technical Session 20 - Track 4.5 - AI Applications for Industry (sponsored by CE Italy Section)
Chair: Paolo Napoletano, *University of Milano Bicocca, Italy*

11:00 **Ultra Tiny Neural Network for Accurate Pressure Sensors Under Multiple Thermal Stresses**
Danilo Pietro Pau, Welid Ben Yahmed, Stefano Bosco and Santo Pennino (STMicroelectronics, Italy); Gian Domenico Licciardo, Prof. and Paola Vitolo (University of Salerno, Italy)

11:20 **Development of a Wildfire Detection and Monitoring Solution Using Computer Vision**
Leo Thomas Ramos (Computer Vision Center, Universitat Autònoma de Barcelona, Spain & Kauel Inc., USA); Edmundo Casas (Kauel Inc., USA); Eduardo Bendek (NASA, USA); Cristian Romero (Kauel Inc., Chile); Francklin Rivas-Echeverría and Dunetchka Cerpa (Kauel Inc., USA); Pablo Hernández and Gonzalo Orellana (Kauel Inc., Chile); José Luis Ibarra (Kauel Inc., Ecuador); Carlos Rosas (Kauel Inc., Chile); Natalia Cuevas (Kauel Inc., USA); Juan Carlos Gallardo (Kauel Inc., Chile)

11:40 **IMU User Transparent Tiny Neural Self-Calibration**
Matteo Cardoni and Danilo Pietro Pau (STMicroelectronics, Italy); Kiarash Rezaei (Politecnico di Milano & STMicroelectronics, Italy)

12:00 **Arm Gesture Recognition With Smartwatches**
Andrea Colombo, Luigi Celona and Simone Bianco (University of Milano-Bicocca, Italy); Antonino Nocera (University of Pavia, Italy); Paolo Napoletano (University of Milan Bicocca, Italy)

12:20 **Multivariate Forecasting of Multiple Pollutants With Representative Deep Learning Architectures**
Simone Bianco, Luigi Celona, Matteo Lanzillotti, Paolo Napoletano (University of Milano-Bicocca, Italy)

11:00 - 12:20 *Room B0.4*
Technical Session 21 - Track 2.4 - AI Applications to Energy and Transportation Systems (Sponsored by PES Italy section)
Chair: Samuele Grillo, *Politecnico di Milano, Italy*

11:00 **Analyzing the Impact of Training Data Availability on Machine Learning Models Accuracy for Regional Photovoltaic Production Forecast**
Nabi Taheri (University of Pisa, Italy); Antonio Piazzi (Data Science Department, Italy); Mauro Tucci (University of Pisa, Italy)

11:20 **Optimizing Battery Storage Systems in Energy Microgrids: A Reinforcement Learning Approach Comparing Multiple Reward Functions**
Giorgia Ghione, Vincenzo Randazzo and Marco Badami (Politecnico di Torino, Italy); Eros GA Pasero (Politecnico of Turin, Italy & Neuronica Lab, Italy)

11:40 **Dynamic Life Cycle Assessment of Electric Power Dispatch With Different Temporal Precision Levels**
Mohammad Hemmati and Navid Bayati (University of Southern Denmark, Denmark); Thomas Ebel (CIE SDU, Denmark)

12:00 **An Efficient and Scalable Algorithm for the Creation of Representative Synthetic AC-OPF Datasets**
Luca Perbellini (Politecnico di Milano, Italy); Matteo Baù (RSE SpA, Italy); Samuele Grillo (Politecnico di Milano, Italy)

11:00 - 12:20 *Room B0.1*
Technical Session 22 - Track 4.6 - AI Applications for Industry (sponsored by TEM Italy Section)
Chair: Monica Rossi, *Politecnico di Milano, Italy*

11:00 **The GPT Store Release and Its Multifaceted Impact**
Laura Bies, Daniela Podevin, Tobias Greff and Tim Grundtner (August-Wilhelm Scheer Institut, Germany); Dirk Werth (AWS-Institute for Digitized Products and Processes gGmbH, Germany)

11:20 **Educational Experience Developed Between Industry and University for Students of a Course of Fluid Flow and Heat Transfer for Chemical Engineers**

Hugo Aldana (Tecnologico de Monterrey, Mexico); Alberto Cantú Pérez (Nutec Bickley, Mexico); José Luis López Salinas, Orlando Castilleja Escobedo and Rubén Eduardo Sánchez García (Tecnologico de Monterrey, Mexico)

11:40 **Comparison of Different Investment Strategies on the Market for Alternative Investment (MAI), Thailand**
Chanrathanak Ngauv and Rujira Chaysiri (Sirindhorn International Institute of Technology, Thammasat University, Thailand)

12:00 **AI Education for Tomorrow's Workforce: Leveraging Learning Factories for AI Education and Workforce Preparedness**
Mohammad Hossein Dehbozorgi (Politecnico di Milano, Italy); Monica Rossi (Politecnico di Milano & MIT, Italy); Sergio Terzi (Politecnico di Milano, Italy); Luca Carminati, Roberto Sala, Francesco Magni and Fabiana Pirola (University of Bergamo, Italy); Rossella Pozzi, Fernanda Strozzi and Tommaso Rossi (LIUC Università Cattaneo, Italy)

10:30 - 11:30	*Room A0.2* **GENEVA 2024 Poster Session (sponsored by WIE Italy Section)**

Resp.: Roberta Di Pace, Monica La Mura, Cristina Costa

6th edition of GENEVA (Gender equality in research and innovation), poster session aimed at illustrating the best practices in managing “gender equality” within funded research and innovation projects.

11:30 - 12:30	*Room A0.2* **IEEE WIE AG Italy Section Annual Meeting 2024 (sponsored by WIE Italy Section)**

Resp. Patrizia Lamberti, Paola Saccomandi, Monica La Mura, Roberta Di Pace

IEEE WIE AG Italy Section annual meeting 2024 with summary of the initiatives in relation to the commitment chart (WIE.steer2STEM.chart “Steering girls to STEM”) and to release the corresponding 4.0 version.

12:30 - 13:00	*Room A0.1* **CLOSING CEREMONY**

13:00 - 14:00	*Politecnico di Milano - Polo Territoriale di Lecco* **LUNCH**