I3M

The 22nd International Multidisciplinary Modeling & Simulation Multiconference

(For online Participants, the Conference Time is Fez Local Time (GMT+1))

Final Program

Organized by

Summary

I3M Partners

The I3M Organization Committee thanks all the partners and institutions for their support to the event.

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List of Conferences and Workshop

The 22nd International Multidisciplinary Modelling & Simulation Multiconference (I3M) involves EMSS, HMS, MAS, IMAACA, DHSS, IWISH, SESDE, FOODOPS, Conferences, Workshops and related Special Sessions; All Sessions are open to all I3M Attendees.

- EMSS: European Modelling & Simulation Symposium, 37th Edition, Part of I3M.
- HMS: The International Conference on Harbour, Maritime & Multimodal Logistics Modelling and Simulation, 27th Edition, Part of I3M.
- MAS: The International Conference on Modelling & Applied Simulation, 24th Edition, Part of I3M.
- IMAACA: The International Conference on Integrated Modeling and Analysis in Autonomous Control and Cognitive Agents, 18th Edition, Part of I3M.
- DHSS: The International Defense and Homeland Security Simulation Workshop, 15th Edition, Part of I3M.
- IWISH: The International Workshop on Innovative Simulation for Healthcare, 14th Edition, Part of I3M.
- SESDE: The International Workshop on Simulation for Energy, Sustainable Development & Environment, 13th Edition, Part of I3M.
- FOODOPS: The International Food Operations and Processing Simulation Workshop, 11th Edition, Part of I3M.
- Special Sessions: I3M Special Sessions are freely open to all the attendees (e.g., Opening Ceremony, I3M Special sessions, etc.).

I3M
Organization Committees

Organization Committees

I3M General co-Chairs
Agostino G. Bruzzone - DIME - University of Genoa, Italy
Yuri Merkuryev - Department of M&S, Riga TU, Latvia

I3M Program Co-Chairs
Francesco Longo - MSC-LES, DIMEG, University of Calabria, Italy
Claudia Frydman - Laboratoire d'Informatique et Systèmes, France

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EMSS: The 37th European Modelling & Simulation Symposium

EMSS General co-Chairs:
Francesco Longo, MSC-LES, DIMEG, University of Calabria, Italy
Emilio Jiménez, La Rioja University, Spain

EMSS Program co-Chairs:
Khalid Mekouar, *ESISA, Marocco*
Antonella Petrillo, Parthenope University of Naples, Italy

HMS: The 27th International Conference on Harbour, Maritime & Multimodal Logistics Modelling and Simulation

HMS General co-Chairs:
Agostino Bruzzone, DIMEG, University of Genoa, Italy
Yury Merkuryev, Riga Technical University, Latvia

HMS Program co-Chairs:
Eleonora Bottani, University of Parma, Italy
Miquel Angel Piera - Autonomous University of Barcelona, Spain

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MAS: The 24th International Conference on Modelling & Applied Simulation

MAS General co-Chairs:
Marina Massei, Liophant Simulation, Italy
Adriano Solis, York University, Canada

MAS Program co-Chairs:
Fabio De Felice, University of Cassino, Italy
Iván Castilla Rodríguez, University of La Laguna, Spain

IMAACA: The 18th International Conference on Integrated Modeling and Analysis in Autonomous Control and Cognitive Agents

IMAACA General co-Chair:
Antonio Padovano, University of Calabria, Italy
Hassan Noura, LIS Aix-Marseille University, AMU

IMAACA Program co-Chair:
Tamás Ruppert, University of Pannonia, Hungary

IMAACA Honorary Chair:
Geneviève Dauphin-Tanguy, France

DHSS: The 15th International Defense and Homeland Security Simulation Workshop

DHSS General Chair:
Agostino Bruzzone, DIME, University of Genoa, Italy

DHSS Program co-Chairs:
Benjamin Goldberg, US Army DEVCOM Soldier Center, USA
Jan Mazal, University of Defense, Czech Republic

IWISH: The 14th International Workshop on Innovative Simulation for Health Care

IWISH General co-Chairs:
Marco Frascio, University of Genoa, Italy
Vera Novak, BIDMC, Harvard Medical School, USA

IWISH Program co-Chairs:
Antonio Giovannetti, *University of Genoa, Italy*
Michael Affenzeller, *Upper Austria University of Applied Sciences, Austria*

SESDE: The 13th International Workshop on Simulation for Energy, Sustainable Development & Environment

Dedicated to the Memory of Janos Sebestyen Janosy

SESDE General co-Chairs:
Claudia Frydman, Laboratoire d'Informatique et Systèmes, France
Gregory Zacharewicz, Ecole des Mines d'Alès, France
Marco Gotelli, University of Genoa, Italy

SESDE Program co-Chairs:
Antonio Cimino, University of Messina, Italy
Youssef Mekouar, *ESISA, Marocco*

FOODOPS: The 11th International Food Operations and Processing Simulation Workshop

FOODOPS General co-Chairs:
Giuseppe Vignali, University of Parma, Italy
Francesco Longo, University of Calabria, Italy

FOODOPS Program Chair:
Vittorio Solina, University of Calabria, Italy

I3M

Hybrid Conference

All the sessions will be physically chaired. If you are a **Session Chair** please follow the instructions reported below.

If you are a Session Chair, below you can find the procedure you are required to follow to manage your session.

1) Please be sure to join the Session Room at least 15 minutes before the Session scheduled time.
2) Check the presence of the speakers in the room and ask them some basic information to properly introduce them before their speeches. Please ask the speakers to upload their presentations on the laptop.
3) Some of the speakers will be online. Please ask them some basic information to properly introduce them. Familiarize yourself with the Microsoft TEAMS meeting functionalities (e.g., camera and microphone controls, desktop sharing, etc.). You can easily find all these functionalities on the screen. A session assistant will be there to start the Microsoft TEAMS session for online participants and to help you if needed.
4) Keep the computer camera and microphone switched ON. At the time of the session you can introduce yourself as Session Chair and you can start the Session. Please be sure to stay close to the microphone to be sure that online participants can hear you well.
5) <u>If you have in person speakers in your session</u>:
    a. Be sure to share the screen of the presentation on Microsoft TEAMS (so the online attendees can follow the presentation).
    b. Ask the speaker to stay close to the microphone (to allow online attendees to listen properly).
    c. After the presentation, please check if there are questions from physical and online participants. If there are no questions, please be prepared to “break the ice” by doing the first question.
6) <u>If you have online speakers in your session</u>:
    a. Ask the speaker to switch the microphone and the camera ON and introduce the speaker.
    b. Ask the speaker to share his/her screen and start the presentation.
    c. After the presentation, please check if there are questions from the physical attendees or from the online attendees. After question time, remember the online speaker to switch the camera and the microphone OFF. If there are no questions, please be prepared to “break the ice” by doing the first question.

I3M

Hybrid Conference

All the sessions will be held in a hybrid mode both in presence and online (through Microsoft TEAMS). If you are an **“in presence” or “online” speaker** please follow the instructions reported below.

Procedure for "in presence" Speakers

If you are an “in presence” Speaker, below you can find the procedure you are required to follow to make your presentation.

- Please join the session at least 15 minutes before the scheduled time and present yourself to the Session Chair.
- At a certain point in time (according to the scheduling of the presentations in the session), the Session Chair will call your name, present you and invite you to join the floor. Please be sure that the screen of the computer is shared on TEAMS.
- Please stay close to the microphone when doing your presentation (so the “online” participants can easily listen your presentation). The duration of each presentation is 10 minutes + 5 minutes of Q&A.

Procedure for "online" Speakers (Conference time is Fez Local Time)

If you are an “online” Speaker, below you can find the procedure you are required to follow to make your presentation.

- Please join the session at least 15 minutes before the scheduled time and present yourself to the Session Chair (you can switch your camera and microphone ON). You can easily find the name of the Session Chair within the Conference Program. After presenting yourself to the Session Chair, please switch your camera and microphone OFF.
- At a certain point in time (according to the scheduling of the presentations in the session), the Session Chair will call your name, present you and invite you to share the screen. At this time, please switch your microphone and your camera ON and make your presentation. The duration of each presentation is 10 minutes + 5 minutes of Q&A.
- After the presentation and questions time, please be sure to switch again your microphone and camera OFF.

I3M

Hybrid Conference

All the sessions will be held in a hybrid mode both in presence and online (through Microsoft TEAMS). If you are an **“in presence” attendee or an “online” attendee** please follow the instructions reported below.

Procedure for "in presence" Session Attendees

If you are an “in presence” Session Attendee, below you can find the procedure you are required to follow during the Session.

- Please join the Session at the scheduled time according to the conference program.
- You will be allowed to make questions at the end of each presentation. Please be sure to raise your hand in case of question. The Session Chair will allow you the make the question.
- When you ask the question remember to stay close to the microphone or to be sure that the online attendees (or speaker) can correctly hear your question (if needed the chair of the session can repeat your question for the online attendees).

Procedure for "online" Session Attendees (Conference time is Fez Local Time)

If you are an “online” Session Attendee, below you can find the procedure you are required to follow during the Session.

- Please join the session at the scheduled time (conference time is Fez Local Time) according to the conference program. The links to join the sessions are reported within the program in correspondence of each session. Once you join the session, please be sure to switch your microphone and camera OFF.
- You will be allowed to make questions at the end of each presentation. Please be sure to raise your hand in case of question (you have to click on the “raised hand” symbol in Microsoft TEAMS. The Session Chair will allow you the make the question by calling your name).
- When you ask the question remember to switch your microphone and camera ON.
- After the interaction with the Speaker please remember to switch your microphone and camera OFF.

I3M

Activities and Sessions Details

Wednesday, September 17th

09:00 am – 10:30 am Fez Local Time, ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: Ground Floor - Main Conference Room**	**Wed 17th,**
Microsoft Teams, Session Link: Access the Online Session	
I3M Opening Ceremony *Chair: Agostino Bruzzone, DIME, University of Genoa, Italy* • **I3M Multiconference** – Prof. Agostino Bruzzone, DIME, University of Genoa, Italy • **Pr. Mustapha Ijjali**, Président de l'université Sidi Mohamed Ben Abdellah USMBA • **Pr. El Mestafa El Hadrami,** Vice président chargé de la recherche scientifique et la cooperation • **EMSS Conference** –Prof. Francesco Longo, University of Calabria, Italy • **HMS Conference** – Prof. Yuri Merkuryev, Riga Technical University, Latvia and Prof. Eleonora Bottani, University of Parma, Italy • **IWISH Workshop** –Prof. Marco Frascio, University of Genoa, Italy • **MAS Conference** – Prof. Adriano Solis, York University, Canada • **IMAACA Conference** –Prof. Antonio Padovano, University of Calabria, Italy • **DHSS Conference** – Prof. Agostino Bruzzone, DIME, University of Genoa, Italy • **SESDE Workshop** – Claudia Frydman, Laboratoire d'Informatique et Systèmes, France; Gregory Zacharewicz, Ecole des Mines d'Alès, France; • **FOODOPS Workshop** – Prof. Giuseppe Vignali, University of Parma, Italy • **Liophant** – Dr. Marina Massei, University of Genoa, Italy • **MISS & MSNet Societies and Simulation Team** – Prof. Emilio Jimènez, La Rioja University, Spain • **I3M and Conference Updates**, Prof. Agostino Bruzzone, University of Genoa, Italy	

10:30 am – 11:00 am Fez Local Time

Coffee Break

11:00 am – 12:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: Ground Floor - Main Conference Room**	**Wed 17th, 2025**

Microsoft Teams, Session Link:

Access the Online Session

I3M Plenary Session Speeches

Chair: Prof. Agostino G. Bruzzone, DIME, University of Genoa, Italy

- **Stephan Winkler, University of Applied Sciences Upper Austria,** *Austria*
  Explainable Artificial Intelligence: Interpretability vs. Explainability
  Due to the increasing complexity of machine learning (ML) models, in numerous applications (such as, e.g., medicine and industry) we need to ensure that the results are understandable and transparent; this shall increase trust and accountability of ML as well as the models trained using ML. In this talk, we will discuss the differences between closed box (a.k.a. white box) modeling and closed box (black box) modeling. Through the application of open-box models, such as symbolic regression, we demonstrate that it is possible to achieve high interpretability without sacrificing model performance. Further, we discuss an overview of methods to measure the explainability and interpretability of machine learning results; this addresses the challenges posed by closed-box models, which lack transparency in their decision-making processes and evaluates techniques used to make these models more understandable. Additionally, we highlight the necessity for robust and unified evaluation metrics for explainability and interpretability, evaluating complexity and fidelity scores as a comprehensive measure. This work aims to contribute to the advancement of responsible and transparent artificial intelligence systems.
  To underpin the practical relevance of these research questions, we discuss several applications from medicine and industry, in which the use of explainable AI by symbolic regression has lead to interpretable high quality results.

- **Tamás Ruppert, University of Pannonia,** Hungary
  AI as a teammate: The future of Human-AI Collaboration and the role of simulation
  As AI evolves from a tool to an active teammate – in both digital and physical forms – it is reshaping the way people work together in complex environments. From intelligent decision support systems to collaborative robots and humanoid assistants, AI is becoming an integral part of teamwork. But how can we design and validate these human-AI interactions to ensure efficiency, trust, and true human-centricity? I will explore the future of human-AI collaboration, focusing on both virtual and physical AI agents, while highlighting the critical role of simulation in shaping these interactions. I will discuss key

challenges, including trust, adaptability, and ethics, as well as practical approaches for using simulation to create AI teammates that augment human strengths. By bridging AI, simulation, and human-centered design, we can build more resilient, efficient, and collaborative teams for the future.

- ***Simaan AbouRizk, University of Alberta,*** *Canada*
  Building Smarter: leveraging AI and Simulation for Better Engineering Decisions
  Over the past three decades, we've witnessed the parallel evolution of simulation and artificial intelligence—two technologies that, when used together, have proven uniquely powerful in solving complex problems in construction engineering and infrastructure systems. This keynote shares a practitioner-researcher's journey of building simulation models and decision support tools, beginning with early process-based systems and integrating AI from its formative years to today's data-driven approaches.
  Drawing on real-world applications—from optimizing construction operations to modeling infrastructure resilience—we'll explore how simulation has served not just as a sandbox for testing AI, but as a critical foundation for embedding intelligence into engineering workflows. Along the way, we've learned that no single technology holds all the answers; instead, progress comes through hybrid systems that combine model-based reasoning, data analytics, and deep domain knowledge. This presentation reflects on key lessons from decades of academic research and industry collaboration, and looks ahead to a future where integrated, explainable, and adaptable systems will be central to managing the growing complexity of the built environment. For academics and practitioners alike, the message is clear: simulation and AI are not parallel paths, but converging forces shaping the next generation of infrastructure innovation

12:30 pm – 2:00 pm Fez Local Time

Lunch Break

2:00 pm – 3:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 11**	**Wed 17th, 2025**
Microsoft Teams, Session Link: Access the Online Session	

Phd Boost

Chair(s): Marco Frosolini, University of Pisa; Athanasios Sypsas, Hellenic Open University, Greece

I3M 2025 introduces the **International PhD BOOST**, an exclusive initiative aimed at providing PhD students with a dynamic and immersive experience, combining research dissemination, industry engagement, and collaborative problem-solving.

This initiative offers PhD students a comprehensive learning experience, enabling them to enhance their research, develop technical expertise, expand their professional network, and engage in an exciting, team-based challenge.

2:00 pm – 3:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 12**	**Wed 17th, 2025**
Microsoft Teams, Session Link: Access the Online Session	

HMS: Smart Logistics and Port Operations
Chair(s): Yuri Merkuryev, Riga Technical University, Latvia; Alessio Baratta, University of Calabria, Italy

- I3M_ 7615: Enhancing logistics through the development of port infrastructure: the role of truck parking facilities
  Raíza Celeghin Benedecti, Vanina Macowski Durski Silva and Gustavo Adolfo A. da Costa

- I3M_533: The Research Landscape of Data-Driven Simulation in Transport and Logistics
  Galina Merkuryeva and Yuri Merkuryev

- I3M_3698: CPDGen: a Scalable Synthetic Dataset Generator for Container Port Operation
  Mohammad Ali Bagheri Orumi, Francesco Bellotti, Riccardo Berta, Alessia Giuliannetti

- I3M_2827: Enhancing Maritime Container Logistics through Optimized Repair Scheduling
  Parham Rezaei, Majed Hadid, Adel Elomri and Nezir Aydin

- I3M_10211: Hydrogen-Powered Transformation of Conventional Ports in Europe and the Mediterranean
  Alessio Baratta, Petronilla Fragiacomo, Matteo Genovese, Francesco Longo, Karen Althea Manfredi, Leonardo Pagnotta, Francesco Piraino, Vittorio Solina

2:00 pm – 3:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 13**	**Wed 17th, 2025**
Microsoft Teams, Session Link: Access the Online Session	

SESDE - IMAACA: Modeling, Control, and Validation in Smart Energy Systems
Chair(s): Thomas Wiedemann, HTW Dresden FB Informatik, Germany

- I3M_7685: Robust Filtering Design for Periodic Piecewise Polytopic Systems over a Low-Frequency Range
  Najwa Nafie, Abderrahim El-Amrani, Noreddine Chaibi and Bensalem Boukili

- I3M_9671: An architecture for distributed validation of multiple simulation models for optimization of the new dynamic electricity prices
  Thomas Wiedemann and Tom Marinovic

- I3M_2628: Automatic verification of wind test in DP annual trials using a rule-based expert system and LSTM network
  Ahmad Saab, Christophe Roman, El Mostafa El Adel and Hassan Noura

- I3M_4429: Renewable Energy Mix System Modelling with Power Grid Integration: Methods, Approach and Challenges
  Tejas Bhor, Helene Danlos, Jean-Samuel Wienin, Jacky Montmain and Nicolas Daclin

- I3M_8304: Control-Oriented Evaluation of Microgrid: Rule-Based vs. Heuristic and LP Strategies
  Meryem Meliani and Sofiane Kichou

2:00 pm – 3:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 14**	**Wed 17th, 2025**

Microsoft Teams, Session Link:

Access the Online Session

EMSS: Modeling & Simulation in Advanced Manufacturing Processes
Chair: Emilio Jimenez Macias, University of La Rioja, Spain

- I3M_8714: Detection of changes in pulsed TIG welding process parameters using acoustic emission
  Mario César Sánchez-Orozco, Manuel Eulogio García-Alvarez, Angel Sanchez Roca, Hipólito Domingo Carvajal-Fals, Juan Ignacio Latorre Biel, Mª Mercedes Pérez de la Parte and Emilio Jimenez Macias

- I3M_414: Machine learning algorithm to predict quality of dissimilar DP600/AISI304 resistance spot-welded joints
  Angel Sanchez Roca, Bárbara Dora Ross Veitía, Juan Ignacio Latorre Biel, Alejandro Espinel Hernández, Mario Sánchez Orozco, Hipólito Carvajal Fals, Mª Mercedes Pérez de la Parte and Emilio Jimenez Macias

- I3M_3422: Advanced in detection of voids in DP600/AISI304 resistance spot weld using digital infrared image processing
  Bárbara Dora Ross Veitía, Dayana Palma Ramírez, Alejandro Espinel Hernández, Ramón Arias Gilart, Angel Sánchez Roca, Mario Sánchez Orozco, Hipólito Carvajal Fals and Emilio Jimenez Macias

- I3M_423: Predicting Surface Quality of CNC-Machined Workpieces Using Vibration Data Analysis
  Michael Bogner, Pascal Lang and Franz Wiesinger

- I3M_3940: Simulation of the Post-Infusion Stage of Vacuum Infusion With Resin Injection Gates Locked
  Sergey Shevtsov, Igor Zhilyaev and Natalie Snezhina

- I3M_10120: Making of Green Steel through Hydrogen Direct Reduction Electrical Design and Analysis
  Agostino G. Bruzzone, Javed Karim, Bharath Gadupuri

3:30 pm – 4:00 pm Fez Local Time

Coffee Break

4:00 pm – 5:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 11**	**Wed 17th, 2025**
Microsoft Teams, Session Link: Access the Online Session	

Phd Boost
Chair(s): Marco Frosolini, University of Pisa, Italy; Athanasios Sypsas, Hellenic Open University, Greece

I3M 2025 introduces the **International PhD BOOST**, an exclusive initiative aimed at providing PhD students with a dynamic and immersive experience, combining research dissemination, industry engagement, and collaborative problem-solving.
This initiative offers PhD students a comprehensive learning experience, enabling them to enhance their research, develop technical expertise, expand their professional network, and engage in an exciting, team-based challenge.

4:00 pm – 5:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 12**	**Wed 17th, 2025**
Microsoft Teams, Session Link: Access the Online Session	

EMSS - MAS: Modeling Market Dynamics and Strategic Behavior
Chair: Vittorio Solina, University of Calabria, Italy

- I3M_4832: Unpacking Herding in CryptoMarkets: An Agent-Based Study of True and Spurious Herding Dynamics
  Arwa Bokhari

- I3M_7976: Towards the Simulation of Agricultural Commodity Price Dynamics in Traditional Markets with Agent-Based Modelling
  Mukarramah Yusuf

- I3M_7417: Modelling co-opetition relationships in business
  Renata Majovská and Petr Fiala

- I3M_1889: Identification and comparative analysis of legal and contractual provisions among different contract types in off-site construction projects
  Yasmine Lafhaj, Alaa Abu Nokta, Tadesse Zelele and Mohamed Al-Hussein

- I3M_4665: Digital Twin and Metaverse Technologies for Sustainable Manufacturing Operations
  Fabio De Felice, Aniello Ferraro, Lucia Acampora, Narinder Sigh, Antonella Petrillo

4:00 pm – 5:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 13**	**Wed 17th, 2025**

Microsoft Teams, Session Link:

Access the Online Session

MAS: Simulation and Optimization in Complex Systems
Chair: Mohaiad Elbasheer, University of Calabria, Italy

- I3M_5651: Experimental and numerical investigation of the effect of geometric design on the thermal performance of helical coils: A comparison of three different geometries
  Sami Missaoui, Eya Missaoui and Zied Driss

- I3M_8463: Use of graph network and hybrid simulation to understand schedule resiliency and capacity under disruptions
  William Correa, Ahmed Bouferguene and Mohamed Al-Hussein

- I3M_7143: A Hybrid Framework Based on Teager Energy Spectrum Correlation and Whale-Optimized Decision Tree Classifier for Fault Diagnosis in Wind Turbine Drivetrain Bearing
  Samuel M. Gbashi, Obafemi O. Olatunji, Paul A. Adedeji and Nkosinathi Madushele

- I3M_6632: Deep Reinforcement Learning with Kelly Strategy Simulation for Portfolio Optimization
  Rongwei Liu, Jin Zheng and John Cartlidge

- I3M_6790: Modeling and Comparative Scenario - Based Simulation of SmartBottle+: An Artificial Intelligence (AI) - Powered Recycling Reward System versus Hungary's Conventional Reverse Vending Machines (RVMs)
  Marcos Daniel Cortijo Mendoza and Mohamed Ammar Ahmed

- I3M_10118: A non-local stress-driven plate study: the Gauss kernel case
  Roberto Cianci, Agostino Bruzzone, Roberta Sburlati

4:00 pm – 5:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 14**	**Wed 17th, 2025**
Microsoft Teams, Session Link: Access the Online Session	

EMSS - IMAACA: Reinforcement Learning and Intelligent Systems for Real-World Applications
Chair: Emilio Jimenez Macias, University of La Rioja, Spain

- I3M_6165: A DRL approach for last-mile delivery with robot fleets
  Martino Digregorio, Pier Paolo Capozza, Gaetano Volpe, Agostino Marcello Mangini, Walter Ukovich and Maria Pia Fanti

- I3M_8539: StockMARL: A Novel Multi-Agent Reinforcement Learning System to Dynamically Improve Trading Strategies
  Peiyan Zou and Peer-Olaf Siebers

- I3M_3487: Exploring micro-retail enterprise resilience strategies: An agent-based simulation and reinforcement learning approach
  Suman Kumar, Siddhartha Sarkar, Jayasree Raveendran and Vivek Balaraman

- I3M_7477: Automated system for nopal cladode classification using coupled applications of deep learning and type-3 fuzzy sets models
  José Luis Rodríguez Álvarez, Jorge Luis García Alcaraz, Emilio Jimenez Macias and José Roberto Díaz-Reza

- I3M_1413: Fire Prediction App Using Machine Learning
  Yuvraj Verma, Sarvesh Tanwar, Karan Kumar and Manoj Kumar

I3M

Activities and Sessions Details

Thursday, September 18th

9:00 am – 10:30 am Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 11**	**Thu 18th, 2025**
Microsoft Teams, Session Link: Access the Online Session	

EMSS - MAS: AI and LLMs for Applications across different Domains

Chair: Antonella Petrillo, Università degli Studi di Napoli "Parthenope", Italy

- I3M_1560: Enhancing Stock Market Prediction with Temporal Graph Neural Networks and Large Language Model-Based Explainability
  Tianye Wang

- I3M_3741: The ALES Platform: State of the Art and Gap Analysis for an Academic LLM Chatbot
  Antonella Petrillo, Kartikee Awasare and Mizna Rehman

- I3M_8604: An LLM-Based System for Accessible and Personalized Scientific Communication
  Antonella Petrillo, Mizna Rehman and Kartikee Awasare

- I3M_2147: Assessing the Maturity of Generative AI Systems: A Framework for Education and Public Engagement
  Antonella Petrillo, Mizna Rehman and Kartikee Awasare

- I3M_9181: Generative AI for Automatic Simulation Model Generation in Factory Planning: A Framework and Prototype
  Sanket Kute, Da Ma, Richard Reider, Marcel Müller and Sebastian Lang

- I3M_10207: AI-enabled Predictive Maintenance in engineer to order CNC machining: architecture, ESG alignment and governance challenges
  Fausta Abbruzzese, Mohaiad Elbasheer, Anna Gacci, Marco Lapucci, Francesco Longo, Giovanni Mirabelli, Letizia Nicoletti

9:00 am – 10:30 am Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 12**	**Thu 18th, 2025**
Microsoft Teams, Session Link: Access the Online Session	

IWISH: Modeling Approaches in Biomedical and Pharmaceutical Systems
Chair: Marco Frascio, University of Genoa, Italy

- I3M_6756: The Role of Leptin and Ghrelin in Food Intake and Body Composition Changes: a mathematical model
  Mantana Chudtong and Andrea De Gaetano

- I3M_724: Mathematical modeling of nicotine-inflicted neuronal damage
  Elena Lo Presti, Dora Kovacs, Matteo Venezia, Gaspare Morreale and Andrea De Gaetano

- I3M_7408: Comparison of wall shear stress-based indices in coronary arteries with different severities of stenosis
  Lina Teresa Gaudio, Salvatore De Rosa, Pierangelo Veltri and Gionata Fragomeni

- I3M_10102: Social Networks impact on Pharmaceutical Industry through the use of
- Strategic Engineering Approach
  Agostino G. Bruzzone, Antonio Giovannetti, Chiara Guidarini, Giulia Sebastiani, Marco Casu, Davide Parodi

- I3M_10208: A Self-Supervised Framework for Predicting the Efficacy of Anti-Cancer Natural Compounds via Transcriptional Response Embeddings
  Tarig Hamad, Sujood B.N. Barri, Mohaiad Elbasheer, Lucia Gazzaneo, Francesco Longo, Vincenzo Pezzi, Rosa Sirianni

9:00 am – 10:30 am Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 13**	**Thu 18th, 2025**

Microsoft Teams, Session Link:

Access the Online Session

EMSS: Data-Driven Simulation in Engineering and Enterprise Systems
Chair(s): Vittorio Solina, University of Calabria, Italy

- I3M_2359: Assessment of Simulated Data for Training Semantic Segmentation-based Perception Models in Construction
  Jorge Luis Jiménez Aparicio, David Böken, Johannes Sprink, Xiaoting Wang and Jürgen Roßmann

- I3M_8768: Enhancing BPMN Simulation through CPN-Light and Modern Tooling
  David Le and Antonín Kavička

- I3M_5262: Dynamic Data-Driven Simulation for project planning and control in steel structure projects
  Ouiame Essaghir, Ahmed Mohamed, Omar Ahmed, Iyad Al Hasan, Yasser Mohamed and Ahmed Hammad

- I3M_7486: Capability Abstractions and Modules for Enterprise Simulation
  Ella Roubtsova

- I3M_8618: Simulation-Based SCADA Model for Wood Panel Manufacturing
  Djamel Eddine Touil, Ahmed Bouferguene, Mohamed Al-Hussein and Simaan AbouRizk

- I3M_10201: Designing a Reusable Pipeline Architecture for Cross-Domain Simulations
  Alessio Baratta, Mohaiad Elbasheer, Lucia Gazzaneo, Karen Althea Manfredi, Letizia Nicoletti, Vittorio Solina, Adriano O. Solis, Athanasios Sypsas

9:00 am – 10:30 am Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 14**	**Thu 18th, 2025**
Microsoft Teams, Session Link: Access the Online Session	
Special Session: I3M 2026, Eurosim Board Meeting and MISS/MSNet Board of Directors Meeting *Chair(s): Agostino Bruzzone, University of Genoa, Italy*	

10:30 am – 11:00 am Fez Local Time

Coffee Break

11:00 am – 12:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 11**	**Thu 18th, 2025**
Microsoft Teams, Session Link: Access the Online Session	
Special Session: STRATEGOS and PATTI TERRITORIALI *Chair(s): Agostino Bruzzone, University of Genova, Italy /; Francesco Longo, University of Calabria, Italy*	

11:00 am – 12:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 12**	**Thu 18th, 2025**
Microsoft Teams, Session Link: Access the Online Session	
EMSS - HMS - MAS: Simulation and Digital Twins for Smart and Sustainable Mobility *Chair: Vittorio Solina, University of Calabria, Italy* > I3M_6720: Modeling methods for the environmental impact assessment of Shared Autonomous Vehicles *Alix Mibrichel Ngari Lendoye, Tatiana Graindorge, Corwin Fèvre and Alain Bouju*	

- I3M_3164: Environmental monitoring combining fixed stations and mobile units for Urban Digital Twins: first field implementations and analysis
  Pardis Ahmadi, Luca Tavanti, Lucanos Strambini and Elvezia Maria Cepolina

- I3M_5746: Parallelizing DEVS Traffic Model for Distributed Systems
  Hassan Haghighi, Maamar El Amine Hamri and Thi Phuong Kieu

- I3M_131: Analysis of a simulation model of a toll plaza at the exit of a regional toll road
  Alexander Talavirya, Tina Rakic and Mikhail Laskin

- I3M_900: Software-Defined Digital Twin Network (SD-DTN) for Autonomous Vehicle (AV) Traffic Management
  Abdelkader Rhiati and Murat Yuksel

11:00 am – 12:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 13**	**Thu 18th, 2025**

Microsoft Teams, Session Link:

Access the Online Session

IMAACA - MAS - EMSS: Human Performance, Behavior, and Well-Being in Digital Systems
Chair: Silvia Carpitella, California State University, Northridge, USA and Adriano Solis, York University, Canada

- I3M_9382: Enhancing worker well-being in digital service systems via numerical simulation
  Pasquale Legato, Lidia Malizia and Rina Mary Mazza

- I3M_5125: Sports analytics optimizing injury prevention and player availability in professional soccer
  Yashwanth Suresh, Roni Avakian, Silvia Carpitella, Maryam Tabibzadeh and Sepideh Abolghasem

- I3M_8104: Management and operators, the basis for success in JIT
  Jorge Luis García Alcaraz, Ingrid Iovana Burgos Espinoza, José Luis Rodríguez Álvarez and Emilio Jimenez Macias

- I3M_6051: A Simulator for Experimental Study of Human In-Play Betting Behavior on Sports Betting Exchanges
  Lawrence Douglas and Dave Cliff

- I3M_3159: Designing cognitive support for Operator 5.0: slave or cyborg?
  Sandra Mattsson, Fredrik Trella, Lars-Olof Johansson, Parisa Jamshidi and Richard Houltz

11:00 am – 12:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 14**	**Thu 18th, 2025**

Microsoft Teams, Session Link:

Access the Online Session

IWISH – EMSS-MAS: Human-Centered Simulation and Sensor-Based Training in Health and Motor Learning

Chair: Marco Gotelli, University of Genoa, Italy

- I3M_4226: Behavioral Biometrics for Remote Exam Integrity: Continuous Authenticity Assessment via Keystroke Dynamics
  Roberto Dillon and Maria De Marsico

- I3M_788: Addition of pannus, pannus flap and thigh overlays on a mannequin to simulate a bariatric patient: Critical for training nursing students
  Andrea King, Darlene Showalter, Cooper Gunter, Delaney Enlow, Cristina Showalter, Ann Metuge, Amy Jo Fogle and Bernard Schroer

- I3M_378: Development of an anatomically accurate and tactile representation of a cervix examination simulator for training nursing students: Focus on cervical dilation during pregnancy
  Lauren Milam, Darlene Showalter, Delaney Enlow, Ann Metuge, Cooper Gunter, Amy Jo Fogle and Bernard Schroer

- I3M_3390: Data-Centric Analysis of Smoothness Degradation and Preservation in Avatar-Based Motor Learning with Violinists
  Hajer Gammoudi, Laura Serra Marin, Luis A. Leiva, Luc Nijs and Inès Chihi

- I3M_2274: Alignment of Multi-Sensor IMU-Applications for Plug-and-Play Operation
  Jan Beckmann and Volkhard Klinger

11:00 am – 12:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 15**	**Thu 18th, 2025**
Microsoft Teams, Session Link: Access the Online Session	

MAS-IMAACA-DHSS-EMSS: Intelligent Systems and Emerging Technologies for Simulation, Automation, and Decision Making
Chair: Tamás Ruppert, University of Pannonia, Hungary

- I3M_2311: Modeling, simulation, and forecasting through rapid model deployment AI platform
  Faruk Herenda, Tarik Hubana and Migdat Hodzic

- I3M_10204: Design and Implementation of Modular IoT Solutions for Environmental Monitoring and Smart Automation: Three Case Studies in the Dominican Republic, Panama, and Italy
  Alessio Baratta, Alessandro Chiurco, Antonio Cimino, Virginia D'Augusta, David Feliz Torres, Caterina Fusto, Giovanni Mirabelli

- I3M_3326: Evaluating Physiological Responses in a VR Sniper Training Scenario - Design Of Experiment
  Abdulrahman K. Eesee, András Darányi, Gergely Kovács and Tamás Ruppert

- I3M_10203: The Integration of Artificial Intelligence and Internet of Things in Smart Manufacturing: a Case Study on ABB's Smart Building Solutions
  Martina Cardamone, Antonio Cimino, Magloire Fopokam Tene, Karen Althea Manfredi, Giovanni Mirabelli, Chiara Sammarco, Vittorio Solina

- I3M_10119: Propaganda's Contamination of the Decision Making Process
  Agostino G. Bruzzone, Bharath Gadupuri, Antonio Giovannetti, Paolo Di Bella

12:30 pm – 2:00 pm Fez Local Time

Lunch Break

2:00 pm – 3:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 11**	**Thu 18th, 2025**
Microsoft Teams, Session Link: Access the Online Session	
Special Session: Projects *Chair(s): Agostino Bruzzone, University of Genoa, Italy* *iSteel-Expert* *LoLiPoP-IoT* *EULEP*	

2:00 pm – 3:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 12**	**Thu 18th, 2025**
Microsoft Teams, Session Link: Access the Online Session	

IWISH: Innovative Simulation Technologies for Healthcare
Chair: Marco Frascio, University of Genoa, Italy

- I3M_3192: Plant-based Biodegradable 3D Printed Surgical Instruments: Enhancing Medical Education
  Athanasios Sivridis, Paraskevas Pakataridis, Martin Daskalov, Filippos Chelmis, Iliana Sorotou, Ashish Neeli, Fani-Christina Papacharalampous, Silvia Pecoraro, Dante Magdici, Marco Frascio and Valentina Valle

- I3M_6291: Development of a computer simulation model and a corresponding 3D printed physical model of a patient with a chemo port: Simulation-based learning for nursing education
  Nilsa Black-Mead, Roderick Zalamea, Haley Hoy, Delaney Enlow, Hutton Schroer, Amy Jo Fogle, Gary Maddux and Bernard Schroer

- I3M_5604: A Simulation System for Medical Students to Improve the Learning Process in Madagascar - SESAM Project
  Marco Raggio, Giancarlo Torre and Umberto Valente

- I3M_6919: Development and Validation of a 3D-Printed Simulator for Flexible Ureteroscopy Training
  Zakaria Tlemsani, Karim Aharrar and Azar Abdeljelil

- I3M_10210: Simulating AI-Mediated Clinical Notes for Surgeon–Specialist Communication: A Randomized Vignette Study
  Marica Padovano, Francesco Longo, Antonio Padovano, Marco Frascio, Bruno Nardo

- I3M_10205: Modeling Emergency Departments with Discrete Event Simulation: A Systematic Review of Underexplored Dimensions
  Alessio Baratta, Antonio Cimino, Giuseppe Emanuele Ferro, Lucia Gazzaneo, Lorenzo Lopez, Emanuele Muraca, Vittorio Solina, Simone Talarico

2:00 pm – 3:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 13**	**Thu 18th, 2025**

Microsoft Teams, Session Link:

Access the Online Session

EMSS - SESDE: Digital Twins and Simulation for Complex System Optimization
Chair: Iván Castilla Rodríguez, La Laguna University, Spain

- I3M_2248: Modeling Tidal flow Constructed Wetland Area Requirements for nitrogen removal in a Mexican university campus Wastewater Treatment Plant
  Mexitli Eva Sandoval-Reyes, Elías Olivos-Chávez, Jonathan Rodríguez-Benavides and Luis A. García-Suárez

- I3M_4494: Towards a Digital Twin for Surgical Waiting List Management: A Preliminary Analysis and Design Study
  Iván Castilla Rodríguez, Gara Miranda, Carolina Rodríguez-Orihuela, Eduardo Segredo and Alejandro Marrero

- I3M_4078: Simulating Burst Buffer for an Efficient Data Placement Policies Selection
  Soraya Zertal, Adrian Khelili, Sophie Robert-Hayek and Philippe Couvée

- I3M_5279: Improvement of Simulated Data for Hybrid Datasets used in Training Perception Models in Construction
  Jorge Luis Jiménez Aparicio, Xiaoting Wang and Jürgen Roßmann

- I3M_ 6828: A Quantitative Framework for the Validation of Twin-Based Cyber Defense
  Fabrizio Baiardi and Vincenzo Sammartino

2:00 pm – 3:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 14**	**Thu 18th, 2025**
Microsoft Teams, Session Link: Access the Online Session	

HMS-SESDE-IMAACA:Modeling and Safety in Energy and Maritime Operations
Chair: Juan Albino Mendez-Perez, La Laguna University, Spain

- I3M_6191: The Safety of the Offshore Structures: Key Challenges, and International Regulatory Frameworks
  Alina Mihalcea, Ana Maria Chirosca and Liliana Rusu

- I3M_9658: A simulation architecture for energy communities
  Angel Marcos Trujillo-Trujillo, Alberto Hamilton-Castro, Santiago Torres-Alvarez, Jose Manuel Gonzalez-Cava and Juan Albino Mendez-Perez

- I3M_7473: Simulation of the Green Hydrogen Supply Chain: A Port-Centered Approach to Maritime Transport and Resource Efficiency
  Luana Pessini, Vanina Macowski Durski Silva and Gustavo Adolfo Alves da Costa

- I3M_6402: Research on the Improvement of the Efficiency of the Energy Electronic Product Supply Chain Empowered by New Quality Productivity
  Wenjin Sun, Xudong Deng and Wenjie Hou

- I3M_4114: Implementation of an Operational Capability Model: Case Study on Offshore Support Vessel Fleet Management
  Hadi Mazloum, Arthur Doliveira, Christophe Roman, Guillaume Graton and Mustapha Ouladsine

2:00 pm – 3:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 15**	**Thu 18th, 2025**

Special Session: SMALLDERS General Assembly
Chair: Vittorio Solina, University of Calabria, Italy

3:30 pm – 4:00 pm Fez Local Time

Coffee Break

4:00 pm – 5:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 11**	**Thu 18th, 2025**

Microsoft Teams, Session Link:

Access the Online Session

MAS - EMSS - SESDE – HMS-IWISH: Behavior, Sustainability, and System Dynamics in Socio-Technical Contexts

Chair: Emilio Jimenez Macias, University of La Rioja, Spain

- I3M_10112: Simulating the Dynamics of Dysphoria through Data-Driven Models:A Systemic and Temporal Analysis
  Agostino G. Bruzzone, Mara Boschetti , Antonio Giovannetti

- I3M_722: Using Generative AI in Supply Chain Management: How and How not?
  Mina Fahim, Noha Mostafa and Mohamed Grida

- I3M_211: Environmental knowledge as a precursor to moral and subjective norms for adopting renewable energy
  Ingrid Iovana Burgos Espinoza, Jorge Luis García Alcaraz, José Roberto Diaz Reza and Emilio Jimenez Macias

- I3M_10101: Modeling Social Analysis of Green Hydrogen: A System Dynamics Approach Based on the Uruguayan Case
  Agostino G. Bruzzone, Soledad Gutierrez, Roberto Kreimerman, Antonio Mauttone, Giovanni M. Ferraris, Santiago Gonzalez, Antonio Giovannetti, Marco Gotelli

- I3M_868: Modeling sustainable pedestrian mobility on long-distance trails: a System Dynamics approach
  Gaetana Rubino, Domenico Gattuso and Manfred Gronalt

4:00 pm – 5:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 12**	**Thu 18th, 2025**

Microsoft Teams, Session Link:

Access the Online Session

EMSS - DHSS - HMS: Simulation and Risk Analysis for Maritime and Transport Infrastructure

Chair: Marco Gotelli, University of Genoa, Italy

- *I3M_9494: Trends in intermodal transport: a bibliometric analysis of the recent literature (2020-2024)*
  Eleonora Bottani

- I3M_5765: ANALYSIS OF AUTOMOTIVE SECTOR IMPORT NETWORKS AT THE PORT OF MANZANILLO, MEXICO
  Lissette Tatiana Avila Bruzón, Salvador Hernández González, Idalia Flores De La Mota and Francisca Irene Soler Anguiano

- I3M_8684: Evaluating European Maritime Infrastructure Resilience through Constructive Simulation and Infrastructure Models
  Arto Niemi, Niklas Rosseck, Niklas Stockfisch, Jan Stockbrugger, Carl Wrede and Frank Sill Torres

- I3M_10116: LNG bunkering risk analysis by innovative interoperable simulation
  Agostino G. Bruzzone,Tomaso Vairo, Alessandro Benvenuto, Marco Gotelli, Antonio Giovannetti

- I3M_10115: A Multi-Domain Simulation Framework for Assessing Hybrid Threats to Maritime and Critical Infrastructures
  Agostino G. Bruzzone, Marina Massei, Marco Gotelli, Antonio Giovannetti

4:00 pm – 5:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 13**	**Thu 18th, 2025**

Microsoft Teams, Session Link:

Access the Online Session

MAS - FOODOPS: Smart Process Optimization through Data and Simulation
Chair: Adriano Solis, York University, Canada

- I3M_7853: Smarter business processes with data-driven automation
  Akhilesh Obalannavar, Silvia Carpitella and Sepideh Abolghasem

- I3M_6485: Simulation of the negotiation process on a multicriteria model
  Petr Fiala and Renata Majovská

- I3M_10111: Data-Driven Modeling and Simulation for Energy-Efficient Blower Control in Water Treatment
  Agostino G. Bruzzone, Marco Gotelli, Kirill Shinelshichicov, Xhulia Sina, Luca Cirillo, Antonio Giovannetti

- I3M_3471: Optimization of Mobile-Integrated Services: Insights from a Healthcare Use Case
  Hanane Eleya, Majed Hadid, Regina Padmanabhan, Adel Elomri, Laoucine Kerbache, Roberto Baldacci and Abdelfatteh El Omri

- I3M_3539: Scalable Data-Driven Modeling of Filter Clogging for Advanced Control and Digital Twin Integration
  Natalya Lysova, Federico Solari, Claudio Suppini, Andrea Volpi and Roberto Montanari

4:00 pm – 5:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 14**	**Thu 18th, 2025**

Microsoft Teams, Session Link:

Access the Online Session

HMS - FOODOPS: Food Waste Reduction and Optimization in Agri-Food Supply Chains
Chair: Giuseppe Vignali, University of Parma, Italy

- I3M_4361: Smart Technologies in Precision Agriculture: An overview
  Marco Mambrioni, Letizia Tebaldi and Andrea Volpi

- I3M_8054: Reordering Perishables: Identifying the Shelf Life Threshold That Simplifies Inventory Management Decisions
  Federico Solari, Natalya Lysova and Roberto Montanari

- I3M_5451: A Review of Packaging Innovations for Food Waste Reduction through Life Cycle Assessment
  Maria Vittoria Rizzo and Giuseppe Vignali

- I3M_3392: Modeling Grain Kernels' Impact Damage
  Feizollah Shahbazi

- I3M_6563: Strategies to Reduce Food Waste in the Perishable Supply Chain: A Combined Interpretative Structural Modeling and MICMAC Analysis Approach
  Laura Monferdini, Andres Boza, Maria Del Mar Eva Alemany and Eleonora Bottani

I3M Awards Ceremony

The I3M Awards will be delivered during the Gala Dinner on September 18th,

8:30 pm – 11:00 pm Fez Local Time **In presence**	**Thu 18th**
Palais Al Firdaous Restaurant, Fez	

I3M Awards Ceremony

I3M Best Paper Awards

The **I3M Best Paper Award** is assigned by the I3M 2025 Best Paper Award International Committee and selected among the top-quality papers presented at I3M based on originality, scientific quality and impact on the manufacturing domain.

Gianni Cantice Award for Gifted Simulation Students

The "Gianni Cantice Research Award for Gifted Simulation Students" will be announced during the I3M Awards Ceremony and attributed to the best simulation student applicants. The Award is entitled to Col. Cantice as recognition for his long activity in Simulation; the Gianni Cantice Award Winner will receive the Award Certificate and a free registration to the next I3M conference. Further information at www.liophant.org/i3m/cantice

Norbert Giambiasi Award

The Norbert Giambiasi Award is entitled to Prof. Norbert Giambiasi as recognition for very highly qualified contribution in Conceptual Modeling and DEVS within International Simulation Community. The Norbert Giambiasi Award Certificate Board selects the paper among best Conceptual Modeling contributions to I3M Conference.

I3M 2025

Activities and Sessions Details

Friday, September 19th

9:00 am – 10:30 am Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 11**	**Fri 19th, 2025**
Microsoft Teams, Session Link: Access the Online Session	

HMS - EMSS - MAS: Digital and Circular Innovations in Sustainable Logistics
Chair: Eleonora Bottani, University of Parma, Italy

- I3M_1626: Simulation-Based Digital Twins for Internal Transport Systems
  Stefan Galka and Sebastian Meißner

- I3M_10117: Extended Reality to improve safety, security and efficiency in Marine Environment
  Agostino G. Bruzzone, Claudia Frydman, Anna F.Sciomachen, Marco Gotelli, Elvezia Maria Cepolina, Antonio Giovannetti, Antonio Martella, Bharath Gadupuri

- I3M_706: Circular Economy and Resilient Logistics Systems: A Remanufacturing Aggregate Production Planning Model and Application
  Eleonora Bottani and Antonio P. Mazzarelli

- I3M_6831: Hybrid Simulation of Textile Waste Collection in the city of Parma: modelling citizen behaviour, system logistics and policy incentives
  Francesco Zammori, Giovanni Romagnoli and Francesco Moroni

- I3M_10206: Mobility as a Service for University Campuses: a case study on the University of Calabria
  Maria Concetta Ariganello, Mohaiad Elbasheer, Lucia Gazzaneo, Giuseppe Guido, Giovanni Mirabelli, Letizia Nicoletti, Vittorio Solina

9:00 am – 10:30 am Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 12**	**Fri 19th, 2025**

Microsoft Teams, Session Link:

Access the Online Session

EMSS - HMS: Optimization and Simulation in Industrial Systems and Processes
Chair: Anna Sciomachen, University of Genoa, Italy

- I3M_9781: GWO-ANN Based Approach for High-Frequency Microstrip Filter Design and Optimization
  Kashif Khan, Saddam Husain and Mohammad Hashmi

- I3M_2944: Minimizing RMG Reshuffling through Preventive Yard Optimization. A Data-Driven Simulation-Based Approach
  Alessia Giulianetti, Anna Sciomachen and Carmine Cerrone

- I3M_8884: Design and manufacturing optimization of innovative heat exchangers: a multi-dimensional approach in industrial systems
  Antonio Giallanza, Guido Di Bella, Rosa Micale and Valeria Palomba

- I3M_6121: Optimization of the Wooden Barrel Production Process
  Javier Bretón, Juan Carlos Sáenz-Díez, María Mercedes Pérez de la Parte, Julio Blanco, Eduardo Martinez Camara and Emilio Jimenez

- I3M_8479: Oil pipeline leaks: modelling and design of innovative plant solutions based on free floating sensor systems
  Behzad Ajdari, Elvezia Maria Cepolina, Fereshteh Rahbar Joyandehkar, Filippo Ghisi, Antonio Giovannetti and Marco Gotelli

9:00 am – 10:30 am Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 13**	**Fri 19th, 2025**
Microsoft Teams, Session Link: Access the Online Session	

IMAACA - EMSS - MAS: Simulation and Intelligent Systems for Smart Environments and Critical Infrastructure

Chair: Antonio Padovano, University of Calabria, Italy

- I3M_3064: Simulation of Smart Home Automation using IOT
  Mayank Goswami, Sarvesh Tanwar, Karan Kumar and Manoj Kumar

- I3M_6296: A Digital Shadow Prototype of an Indoor Drone using Interactive Sensing System
  Rupesh Bade Shrestha and Konstantinos Mykoniatis

- I3M_2509: Designing water-energy intelligent cities: a cross-sectoral optimization approach
  Adrielly Nahomee Ramos Alvarez and Idalia Flores-De-la-Mota

- I3M_5627: A Group Decision-Making Based Spherical Fuzzy MCDM Approach for Smart Airports
  Celal Alpay Havle and Hatice Küçükönal

- I3M_919: Use of Agent-Based Simulation Models: A Review for First Responder Capabilities in Disaster Response
  Oğuz Emir, Okay Işık and Murat Ermiş

9:00 am – 10:30 am Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 14**	**Fri 19th, 2025**

Microsoft Teams, Session Link:

Access the Online Session

DHSS - EMSS: Modeling and Simulation for Threat Response in Critical and Multidomain Environments

Chair: Agostino Bruzzone, University of Genoa, Italy

- I3M_7647: CBRNE Threats in Civilian Airports: security, detection technologies and crisis management
  Mariusz Urban

- I3M_10107: Audience Behavior Modeling for Cognitve Warfare Training in Multidomain Environments
  Agostino G. Bruzzone, Antonio Giovannetti, Marco Gotelli,Filippo Ghisi, Massimo Pedemonte, Guna Snore, Gundars Bergmanis-Korats, Raitis Ralfs Vecmanis

- I3M_10105: Modeling Complex CBRNe Scenarios in Federated Synthetic Environments
  Agostino G. Bruzzone, Marco Gotelli, Luca Cirillo, Filippo Ghisi, Andrea Reverberi, Massimo Pedemonte, Wolfard Schmidt

- I3M_10113: Modeling and Simulation for Cognitive Threat Assessment in Critical Infrastructures Industrial Plants
  Antonio Giovannetti

- I3M_10114: Modeling to address industrial processes criticialities in use of new generation UGVs within aggressive environment conditions
  Marco Gotelli

10:30 am – 11:00 am Fez Local Time

Coffee Break

11:00 am – 12:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 11**	**Fri 19th, 2025**
Microsoft Teams, Session Link: Access the Online Session	

EMSS - IMAACA - MAS - DHSS: Strategic Modeling and AI for Complex Systems and Resilience
Chair: Agostino Bruzzone, University of Genoa, Italy

- I3M_10104: An AI-Driven Framework based Open Source Data Analytics and Strategic Simulation Modeling for Multi-Country Strategic Analysis
  Agostino G. Bruzzone, Marina Massei, Marco Gotelli, Luca Cirillo, Filippo Ghisi, Xhulia Sina

- I3M_6586: Structuring Federated Data Interoperability: A Multi-Level Framework
  Leonardo Daou, Eva Petitdemange, Gregory Zacharewicz, Nicolas Daclin and Séverine Durieux

- I3M_7583: Designing Agent Behaviours for the Development of an Agent-Based Modelling and Simulation for Emergency Response
  Hanan Altamimi

- I3M_10110: Agentic AI for Landlocked Nations: A Low-Cost Architectural Blueprint for Resilient Agricultural Supply Chains
  Agostino G. Bruzzone, Giacomo Genta, Daniele Cefaliello, Alberto Cantone

- I3M_10108: Experimental Modeling of Writing Styles for Authorship : Verification via Punctuation Analysis
  Roberto Dillon, Agostino G. Bruzzone, Marco Gotelli

11:00 am – 12:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 12**	**Fri 19th, 2025**

Microsoft Teams, Session Link:

Access the Online Session

EMSS - HMS: Advanced Technologies and Simulation for Operational Efficiency and Safety
Chair: Alessio Baratta, University of Calabria, Italy

- I3M_9003: Visual Management and 5S Impact on Economic Sustainability: A Structural Equation Model
  José Roberto Díaz Reza, Jorge Luis García Alcaraz, Ingrid Iovana Burgos Espinoza and Emilio Jimenez Macias

- I3M_6577: A possible approach to integrate Computer Vision and Blockchain for Construction Safety Management
  Luigi Rarità, Claudia Pipino, Chiara Marciano and Antonio Raia

- I3M_8342: GPU-Based Simulation of Evolutionary Spatial Cyclic Games: A Comparative Evaluation of Apple vs Nvidia
  Louie Sinadjan and Dave Cliff

- I3M_4736: Implement the Parallel Pipeline Design Pattern using Threads, TBB, and SYCL, A comparative study
  Mario Rossainz-Lopez, Bárbara Sánchez-Rinza, Rodolfo Rosas-Lezama, Manuel Capel-Tuñón

- I3M_10109: Immersive Training and Operational Planning in Intermodal Hub
  Agostino G. Bruzzone, Marina Massei, Marco Gotelli, Luca Cirillo, Kirill Shinleshichikov, Marina Cardelli

- I3M_10301: Production Capacity Assessment: A case Study
  Jose Matias Rimolo, Gianluca Fratta, Stefano Saetta

11:00 am – 12:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 13**	**Fri 19th, 2025**
Microsoft Teams, Session Link: Access the Online Session	

IMAACA - EMSS: Modeling and Performance Optimization in Embedded and Software Systems
Chair: Tamás Ruppert, University of Pannonia, Hungary

- I3M_436: Autonomous Mobile Robot Modeling including Battery Consumption
  Hassanein Hellani, Paul Chauchat and Guillaume Graton

- I3M_1070: Devising the optimal design for LoRaWAN signal blocker
  Mikhail E. Belkin, Vladislav Golovin, Yury Tyschuk and Alexey Alyoshin

- I3M_2153: Performance Comparison of Neural and Ensemble High Frequency GaN HEMTs Small-SignalModels
  Adilzhan Kurmangali, Saddam Husain and Mohammad Hashmi

- I3M_9394: Model-Based Software Design Validation of C++ Software Systems Using SOLID Principle Metrics
  Franz Wiesinger, Manuel Ahrer and Michael Bogner

- I3M_10209: Bridging Cognitive Digital Twins and Cognitive User Interfaces: A Systematic Literature Review
  Martina Cardamone, Mohaiad Elbasheer, Francesco Facchini, Giovanni Mirabelli, Antonio Padovano, Chiara Sammarco, Micaela Vitti

11:00 am – 12:30 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **Room: First Floor Room 14**	**Fri 19th, 2025**
Microsoft Teams, Session Link: Access the Online Session	

MAS - HMS - EMSS - SESDE: Intelligent Maintenance and Resilient Operations through Simulation
Chair: Gregory Zacharewicz, IMT Mines Alès, France

- I3M_9936: A Noise-Invariant Strategy for Fault Diagnosis in Wind Turbine Main Shaft Bearings: A Comparative Investigation of Attention-Based CNN Models

Samuel M. Gbashi, Obafemi O. Olatunji, Paul A. Adedeji and Nkosinathi Madushele

- I3M_10106: Simulation-Driven Scheduling Optimization with Agentic AI in Operations and Maintenance
  Agostino G. Bruzzone, Marco Gotelli, Luca Cirillo, Antonio Giovannetti, Antonio Martella

- I3M_8605: Issues of structural adaptivity in the process mining
  Shengrui Peng and Helena Szczerbicka

- I3M_10103: Hybrid Simulation of Energy, Water and Healthcare Interactions under Climate Stress: The WELLNESS Approach
  Agostino G. Bruzzone, Luca Cirillo, Giorgia La Torre, Andrea Garaccioni, Luca Benvenuto, Francesco Romaggi

- I3M_10202: AI-Based Predictive Maintenance for a Slitter Rewinder: a Case Study
  Antonio Cimino, Giovanni Laboccetta, Francesco Longo, Karen Althea Manfredi, Letizia Nicoletti, Antonio Padovano, Nereo Salerno, Vittorio Solina, Luigi Maria Tridico

12:30 pm – 2:00 pm Fez Local Time ***Ecole Supérieure d'Ingénierie En Sciences Appliquées (ESISA)*** **(During Luncheon)**	**Fri 19th, 2025**

Only in Presence

I3M 2025 Closing Ceremony

Chairs: Agostino Bruzzone, University of Genoa, Italy; Francesco Longo, University of Calabria, Italy.

All “in presence” attendees are invited to join the I3M Closing Ceremony. The Closing Ceremony is a nice opportunity to wrap-up the conference experience and to say hello each other waiting for the next I3M edition (2026).

I3M Social Events

The I3M Local Organization Committee has organized one main Social Event for I3M. Please find below the relevant information.

I3M Gala Dinner

The I3M Gala Dinner will be held on Thursday, September 18th at the stunning "**Palais Al Firdaous Restaurant"** in Fes. Nestled in the old medina, and with a legacy rooted in tradition, this restaurant offers an unforgettable dining experience that celebrates the rich flavors and aromas of authentic Moroccan cuisine.

Getting to the Palais Al Firdaous Restaurant

Here's how you can reach the " **Palais Al Firdaous Restaurant** " from the Conference:

By car: Just 14 minutes by car (6,9 km).

I3M Proceedings Publication

The I3M Conference Proceedings will be published as a dedicated issue of the **Elsevier Procedia Computer Science** (CiteScore: 4.0). Launched in 2009, Procedia Computer Science is an electronic product focusing entirely on publishing high quality conference proceedings. Procedia Computer Science is **Open Access and indexed in Scopus**, thus providing maximum exposure for your work. For authors publishing in Procedia Computer Science, accepted manuscript will be governed by CC BY-NC-ND license.

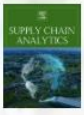
Previous editions: click here to view published I3M papers

International Journal Special Issues

The Organization Committee will tentatively set-up the following International Journals Special Issues.

Applied Sciences – MDPI (ISSN 2076-3417)

A selection of papers will be shortlisted by the I3M IPC on the topic "**Supply Chains and Logistics 4.0**" and invited to extend their work for possible publication on Applied Sciences. Papers will be candidate to receive a **full waiver** for submission to Applied Sciences. The selected papers will go through the standard peer review process. Applied Sciences is indexed in many scientific databases like **Scopus** and **Web of Science** and publishes **Open Access**.
Contacts: *Vittorio Solina - University of Calabria, Italy*
Website: https://www.mdpi.com/journal/applsci/special_issues/VY1HVWXJZA



Supply Chain Analytics– Elsevier (ISSN 2949-8635)

A selection of papers will be shortlisted by the I3M IPC on the topic "**Data-driven simulation and Analytics for Sustainable, Resilient Supply Chain Decision Support**" and invited to extend their work for possible publication on Supply Chain Analytics. Papers will be candidates to receive a waiver for submission. Supply Chain Analytics is indexed in many scientific databases like **Scopus**.
Contacts: *Eleonora Bottani- University of Parma, Italy*

Sustainability– MDPI (ISSN 071-1050)

A selection of papers will be shortlisted by the I3M IPC on the topic "**Digital Green: Transforming Supply Chains for a Sustainable Future**" and invited to extend their work for possible publication on Sustainability. Papers will be considered to receive a **full waiver** for submission. Sustainability is indexed in many scientific databases like **Scopus**, **Web of Science** and will be publishes **Open Access.**
Contacts: *Eleonora Bottani- University of Parma, Italy*

I3M Authors and Chairs Guidelines

Author and Chair Guidelines for the I3M Hybrid Conference are available in the conference website at:

www.msc-les.org/i3m

Please check them in order to proper deliver your presentation in best way avoiding any inconvenience.

I3M as evolving framework

Dear attendee, the edition of I3M will be held as hybrid event (both in presence and online). Please check the website for additional information at:

www.msc-les.org/i3m

Alternatively, you can write to Prof. Francesco Longo (f.longo@unical.it).

The whole I3M Organization Committee is glad to see you in Fez and online. We really hope you will enjoy the hybrid conference, therefore we are looking forward to further develop and improve the I3M conference in 2026.
By participating in I3M it is evident that a major stronghold of this Multi-Conference is its capability to mix very experienced people with young blood. So we will be glad if you could consider to be more involved in the 2026 edition by submitting session or track proposals, by proposing new topics or by providing your availability for being candidate for paper review. In addition, please feel free to share any comment and suggestion to improve the conference to Prof. Francesco Longo, I3M Program Chair (f.longo@unical.it).

I3M Synergies & Other Opportunities

The I3M organization Committee is working in synergies with other International Conferences to provide attendee with additional publication opportunities and professional training.

ISM

The ISM (International Conference on Industry of the Future and Smart Manufacturing) represents an innovative platform for knowledge exchange, the review and discussion of theoretical advances, research results, and industrial experiences, among scientists, researchers, decision makers, practitioners and students dealing with the topics under the umbrella of Industry 4.0/5.0 and Smart Manufacturing.

Therefore, we would like to kindly invite you to take an active part in this conference and in the co-located events that will be held at the University of Malta, next November 12-14, 2025, and explore with us the latest news, views and developments in the exciting world of Industry 4.0/5.0 and Smart Manufacturing.

For further information please check the web site:
http://www.msc-les.org/ism

You can also write to Dr. Vittorio Solina (vittorio.solina@unical.it).
So, we will be glad if you could consider to be more involved in future events by submitting session or track proposals, by proposing new topics or by providing your availability for being candidate for paper review or by inviting companies and managers to attend the ISM event.

Synergies & Other Opportunities

The I3M organization Committee is working in synergies with other International Conferences to provide attendee with additional publication opportunities and professional training.

SIREN M&S Courses

The Modeling & Simulation Professional Courses are organized with scientific sponsorization of MITIM DIME University of Genoa, Simulation Team, MSC-LES University of Calabria and Liophant. Attendees have the opportunity to select among different M&S courses levels (i.e. Fundamentals, Regular, Advanced Educational Package) and categories (i.e. M&S, VV&A, PM and Interoperability). Each M&S course includes lecturing and exercises provided by world-wide experts, with several years of experience, from major center of excellence, i.e. MITIM-DIME University of Genoa, Virginian Modeling & Simulation Center (VMASC), GrVa Universidad Federal de Rio de Janeiro, LSIS Marseille, MAST, MSC-LES, National Center for Simulation (NSC), NASA, Riga TU, UAB, University of Arizona, etc. If you are interested in next SIREN Courses please visit www.mastsrl.eu/mscourses or contact info@mastsrl.eu.

SILENI

SILENI (SImulation LEarning iNItiative) is an initiative devoted to promote M&S applied to real problems with special attention to Defense and Industry; SILENI promotes Seminars, Courses and Lectures on application of M&S. The name SILENI (SImulation LEarning iNItiative) is inspired by Greek mythology where Sileni (companions of Dionysus) were said to possess special knowledge and power of prophecy such as Modeling & Simulation. If you are interested in next SILENI Initiatives and Seminars please visit www.liophant.org/sileni or contact info@liophant.org