

I3M 2021

The 18th International Multidisciplinary Modeling & Simulation Multiconference

(Conference Time: CEST)

Program

Organized by



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I3M 2021 Partners

The I3M 2021 Organization Committee thanks all the partners and institutions for their support to the event.

Scientific Partners



Industrial Sponsors



Media Partners



I3M 2021

List of Conferences and Workshops

The 18th International Multidisciplinary Modelling & Simulation Multiconference (I3M 2021) involves EMSS, HMS, MAS, DHSS, IWISH, SESDE, FOODOPS, Conferences, Workshops and related Special Sessions; All Sessions are open to all I3M Attendees.

- EMSS: European Modelling & Simulation Symposium, 33rd Edition, Part of I3M 2021.
- HMS: The International Conference on Harbour, Maritime & Multimodal Logistics Modelling and Simulation, 23rd Edition, Part of I3M 2021.
- MAS: The International Conference on Modelling & Applied Simulation, 20th Edition, Part of I3M 2021.
- DHSS: The International Defense and Homeland Security Simulation Workshop, 11th Edition, Part of I3M 2021
- IWISH: The International Workshop on Innovative Simulation for Healthcare, 10th Edition, Part of I3M 2021.
- SESDE: The International Workshop on Simulation for Energy, Sustainable Development & Environment, 9th Edition, Part of I3M 2021.
- FOODOPS: The International Food Operations and Processing Simulation Workshop, 7th Edition, Part of I3M 2021.
- Special Sessions: I3M Special Sessions are freely open to all the attendees (e.g. Opening Ceremony, I3M 2021 Special sessions, etc.).

I3M 2021

Organization Committees

Organization Committees

I3M 2021 General co-Chairs

Agostino G. Bruzzzone - DIME - University of Genoa, Italy

Yuri Merkuryev - Department of M&S, Riga TU, Latvia

I3M 2021 Program Co-Chairs

Francesco Longo - MSC-LES, DIMEG, University of Calabria, Italy

Miquel Angel Piera - Autonomous University of Barcelona, Spain

EMSS: The 33rd European Modelling & Simulation Symposium

EMSS General Chair:

Francesco Longo, MSC-LES, DIMEG, University of Calabria, Italy

EMSS Program co-Chairs:

Michael Affenzeller, Upper Austria University of Applied Sciences, Austria

Antonella Petrillo, Parthenope University of Naples, Italy

HMS: The 23rd International Conference on Harbour, Maritime & Multimodal Logistics Modelling and Simulation

HMS General co-Chairs:

Agostino Bruzzzone, 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

MAS: The 20th International Conference on Modelling & Applied Simulation

MAS General co-Chairs:

Marina Massei, Liophant Simulation, Italy

Adriano Solis, York University, Canada

MAS Program Chair:

Fabio De Felice, University of Cassino, Italy

DHSS: The 11th International Defense and Homeland Security Simulation Workshop

DHSS General co-Chairs:

Agostino Bruzzone, DIMEG, University of Genoa, Italy

Benjamin Goldberg, US Army DEVCOM Soldier Center, USA

IWISH: The 10th 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

SESDE: The 9th International Workshop on Simulation for Energy, Sustainable Development & Environment

SESDE General co-Chairs:

Janos Sebestyen Janosy, Centre for Energy Research, Hungary

Gregory Zacharewicz, Ecole des Mines d'Alès, France

SESDE Program Chair:

Letizia Nicoletti, CAL-TEK Srl, Italy

FOODOPS: The 7th International Food Operations and Processing Simulation Workshop

FOODOPS General Chair:

Giuseppe Vignali, University of Parma, Italy

FOODOPS Program Chair:

Francesco Longo, University of Calabria, Italy

I3M 2021

Online Virtual Conference

Due to the Covid-19 emergency and for the health and safety of our Attendees, this year the I3M conference will be an online Virtual Conference.

All the sessions will be held online through Microsoft TEAMS.

Procedure for online Participation

- > All the I3M Sessions will be held online through Microsoft TEAMS.
- > Within the Program you will find a link to each I3M Session. Please click on the link before the scheduled time for the session. **The conference time is CEST**
- > Once you access the session, please be sure to keep your microphone and camera switched OFF unless you are one of the Speakers or the Session Chair (check the next page for speakers and Session Chairs guidelines). You will be allowed to use your microphone during the question time.
- > In the next pages, the instruction for Sessions' Chairs, for Speakers and for session's attendees are reported.

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Procedure for online Session Chair

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 online Session at least 15 minutes before the Session scheduled time. Familiarize yourself with the Microsoft TEAMS meeting functionalities (e.g. camera and microphone controls, desktop sharing, list of participants, etc.). You can easily find all these functionalities on the screen.
- 2) Keep your camera and microphone switched ON. At the time of the session you can introduce yourself as Session Chair and you can start the Session.
- 3) Ask the first speaker to switch the microphone and the camera ON and introduce the speaker.
- 4) Ask the speaker to share his/her screen and start the video of the presentation. Each video should last 10 minutes maximum.
- 5) After the video of the presentation, please check if there are questions from Attendees by looking at the “raised hand” symbol in the list of participants and let them (one by one by calling their names) to make their questions and receive the answers from the speaker. After question time, remember the 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.
- 6) Please repeat steps 3 to 5 for the remaining speakers.
- 7) After all the presentations, please take a couple of minutes to thank everyone and close the session.

I3M 2021

Online Virtual Conference

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All the sessions will be held online through Microsoft TEAMS.

Procedure for Speakers online presentation

If you are a Speaker, below you can find the procedure you are required to follow to make your presentation.

- 1- 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.
- 2- 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 video of your presentation. At this time, please switch your microphone and your camera ON and share the video of your presentation.
- 3- The video of your presentation must not exceed 10 minutes length. Be ready to answer questions made by session's attendees.
- 4- After the presentation, please be sure to switch again your microphone and camera OFF.

I3M 2021

Online Virtual Conference

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All the sessions will be held online through Microsoft TEAMS

Procedure for Session Attendees

If you are a Session Attendee, below you can find the procedure you are required to follow during the Session.

- 1- Please join the Session at the scheduled time according to the conference program. Once you join the Session, please be sure to switch your microphone and camera OFF.
- 2- 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).
- 3- When you ask the question remember to switch your microphone and camera ON.
- 4- After the interaction with the Speaker please remember to switch your microphone and camera OFF.

I3M 2021

Activities and Sessions Details

Wednesday, September 15th

09:00 am – 10:30 am CEST, <i>Online</i>	Wed 15th, 2021
<i>Microsoft Teams, Session Link:</i> Access the Online Session	
I3M 2021 Opening Ceremony <i>Chair: Agostino Bruzzone, DIME, University of Genoa, Italy</i> <ul style="list-style-type: none">• I3M Multiconference – Prof Agostino Bruzzone, DIME, University of Genoa, Italy• I3M Proceedings and other news - Prof. Francesco Longo, MSC-LES, University of Calabria, Italy• EMSS Conference – Prof. Michael Affenzeller, Upper Austria University of Applied Sciences, Austria• HMS Conference – Prof. Yuri Merkuryev, Riga Technical University, Latvia• MAS Conference – Prof. Adriano Solis, York University, Canada• DHSS Conference – Prof Agostino Bruzzone, DIME, University of Genoa, Italy• IMAACA Conference – Prof Loucas S. Louca, University of Cyprus, Cyprus• IWISH Workshop – Prof. Marco Frascio, University of Genoa, Italy• SESDE Workshop – Prof. Janos Sebestyen Janosy, Centre for Energy Research, Hungary• FOODOPS Workshop – Prof. Giuseppe Vignali, University of Parma, Italy• Liophant – Dr. Marina Massei, University of Genova, Italy• MISS & MSNet Societies – Prof. Miquel Angel Piera, Autonomous University of Barcelona, Spain• Simulation Team – Prof. Emilio Jimenez, La Rioja University, Spain• I3M 2022 and Conference Updates, Prof. Agostino Bruzzone, University of Genoa, Italy	

10:30 am – 11:00 am CEST

Break

11:00 am – 12:30 pm CEST Online	Wed 15th, 2021
Microsoft Teams, Session Link: Access the Online Session	
I3M Plenary Session Speeches Chair: Prof. Agostino G. Bruzzone, DIME, University of Genoa, Italy <ul style="list-style-type: none"> > Prof. Gregory Zackarewicz, Full Professor, IMT Mines Ales (National Institute of Mines and Telecommunications), France <i>Modeling & Simulation Driven framework for Interoperability of Enterprise System M&SDIES</i> > Prof. Alfredo Garro, Associate Professor, SMASH Lab Director, University of Calabria, Italy <i>From Space to Earth: Enabling a-priori interoperability of HLA- based simulations using standards and simulation design patterns</i> > Prof. Simon Taylor, Professor and Vice-Dean (Research) for the College of Engineering, Design and Physical Sciences, Brunel University London, UK <i>Distributed Simulation: Experiences and Reflections</i> 	

12:30 pm – 2:00 pm CEST

Lunch Break

2:00 pm – 3:30 pm CEST Online	Wed 15th, 2021
Microsoft Teams, Session Link: Access the Online Session	
EMSS/MAS/HMS/IWISH: Virtual Reality Applications in different domains Chair: Antonio Padovano, University of Calabria, Italy <ul style="list-style-type: none"> > Unity3D-based Simulation for Operations Management Teaching <i>Javier Pernas-Álvarez, Diego Crespo-Pereira</i> > Comparing a VR ship simulator using an HMD with a commercial ship handling simulator in a CAVE setup (I3M_9) <i>Rieke Leder, Matthias Laudan</i> > A Real-Time Streaming Based VR Scenario Construction Method for the Simulation of Complex Products (I3M_47) <i>Yi Lv, Yufen Wu, Xue Yang, Shuhong Xu</i> > Virtual Reality System for training in the detection and solution of failures in induction 	

motors

Gustavo Caiza, Marco Riofrio-Morales, Veronica Gallo C., Santiago Alvarez-T., Wilson O. Lopez, Marcelo V. Garcia

- > Use of Virtual Reality for Training on Procedures in an Intensive Care Unit during the COVID-19 Pandemic
Ali Asgary, Mohammad Ali Shafiee, Abel Guimaraes, Nazanin Nadri, Philip Ma, Christie M. Lee, Mehdi Aarabi, Mohammadali Tofighi, Adriano O. Solis, Jianhong Wu
- > Reducing Dangers within Industrial Plants by Extended Reality (I3M_158)
Agostino Bruzzone, Marina Massei, Kirill Sinelshchikov, Antonio Giovanetti

2:00 pm – 3:30 pm CEST

Online

Wed 15th, 2021

Microsoft Teams, Session Link:

[Access the Online Session](#)

HMS/MAS: Simulation & Optimization in warehousing, supplying and distribution

Chair: Eleonora Bottani, University of Parma, Italy

- > A hybrid heuristic algorithm for solving the Traveling Salesman Problem with Time Windows (I3M_5)
Mattia Neroni, Letizia Tebaldi
- > Exact and heuristic static routing algorithms for improving online grocery shopping logistics (I3M_35)
Francesco Cepolina, Elvezia Maria Cepolina, Guido Ferla
- > On line shopping and logistics: a fast dynamic vehicle routing algorithm for dealing with information evolution (I3M_36)
Elvezia Maria Cepolina, Francesco Cepolina, Guido Ferla
- > Optimizing picking operations in a distribution center of the large-scale retail trade (I3M_119)
Eleonora Bottani, Beatrice Franchi
- > A Flexible and Generic Simulation Model for in-Bound Transport Systems (I3M_120)
Slaheddine Mestiri, Jazib Jamil, Johannes Fottner
- > A Multi-Criteria Cost-Benefit Analysis to optimize the oil supply networks (I3M_127)
Muhammad Bilal, Yousaf Ali, Muhammad Sabir, Antonella Petrillo, Fabio De Felice

2:00 pm – 3:30 pm CEST Online	Wed 15th, 2021
Microsoft Teams, Session Link: Access the Online Session	
EMSS/IWISH: Modelling and Simulation Approaches in and for Education (in Healthcare) Chair: Maja Atanasijevic-Kunc, University of Ljubljana (Slovenia) <ul style="list-style-type: none"> > 3D Printed Model of Human Anatomy for Training Nursing Students: Skeletal, Respiratory and Circulatory Systems (I3M_8) <i>Lori Lioce, Kimberly Budislich, Marquis Myler, Cooper Gunter, Dietmar Moeller, Gary Maddux, Bernard Schroer</i> > Modelling and simulation: adaptation of educational processes to epidemic measures (I3M_38) <i>Maja Atanasijević-Kunc, Gorazd Karer</i> > Development of a Needle Injection Pad Trainer for Simulating Intradermal, Subcutaneous and Intramuscular Injections: Used in Student Nurse Training (I3M_94) <i>Lori Lioce, Sidney Gunter, Gary Maddux, Ishella Fogle, Bernard Schroer</i> > Practicable Paradigms for Semi-Automated Expert-User Post-Processing of Deep-Learning Segmentations in 3D Radiology (I3M_129) <i>Julian Jany, Gerald Adam Zwettler</i> > Improving Operational Procedures to Access Industrial Facilities and Urban Areas during Pandemics (I3M_163) <i>Agostino Bruzzone, Marina Massei, Javier Pernas, Andrea Reverberi</i> > Influence of Cannula Angle For Cardiopulmonary Bypass Using Computational Fluid Dynamics (I3M_93) <i>Gionata Fragomeni</i> 	

2:00 pm – 3:30 pm CEST Online	Wed 15th, 2021
Microsoft Teams, Session Link: Access the Online Session	
Special Session: 5G-ERA: 5th Generation Enhanced Robot Autonomy (a H2020 funded project) Chair: Dr. Marios Sophocleous, eBOS Technologies Ltd, Cyprus <p>The next generation of intelligent systems, especially robots, will need to be more autonomous and resilient. Research and industry have many times attempted to improve the capabilities via</p>	

the evolution of 5G technologies focusing on feasibility studies and introduction of new bandwidth. Robot autonomy is essential for many 5G vertical sectors and can provide multiple benefits in automated mobility, Industry 4.0 and healthcare. 5G technology, on the other hand, has great potential towards enhancing robot autonomy. 5G Enhanced Robot Autonomy (5G-ERA), a Horizon 2020 funded project, aims alongside all other ICT-41 projects to provide an enhanced 5G experimentation facility and relevant Network Applications (NetApps) for 3rd party application developers. This will create a 5G experimentation playground to test and qualify their applications. The project's ambition is on the user-centric paradigm of integrating vertical knowledge into the existing standardised 5G testing framework to improve Quality of Experience (QoE) for vertical customers. Use cases from four vertical sectors, namely public protection and disaster relief (PPDR), transport, healthcare and manufacturing will be validated in the project by rapid prototyping of NetApp solutions and enhanced vertical experiences on autonomy. These case studies can be regarded as showcases of the potential of 5G and 5G-ERA towards the acceleration of the ongoing convergence of robotics, Artificial Intelligence (AI), Machine Learning (ML) and cloud computing; and to unlock a next level of autonomy through 5G based learning in general. This session will provide all the academic and industrial innovations and progress towards an enhanced robot autonomy using the 5th generation networks whilst providing insights on the initial designs, challenges and ways of overcoming them identified in this first year of this ambitious project.

- > 5G-ERA: 5G Enhanced Robot Autonomy (I3M_SS1)
Alessandro di Fava, Robotnik
- > Visual SLAM resource optimization with Docker (I3M_SS2)
Bartosz Bratus, University of Bedfordshire
- > Enhanced experimentation facility for manufacturing (I3M_SS3)
Stefano Tedeschi and Kandarp Amin, TWI
- > Leveraging a Distributed ROS to enhance Industrial Robotic Applications (I3M_SS4)
Sebastian Andraos, Hal Robotics
- > A Netapp Digital Twin application for onsite Smart Operator in Manufacturing Systems (DEMO), (I3M_SS5)
Francesco Longo, Vittorio Solina, CAL-TEK, Italy

3:30 pm – 4:00 pm CEST

Break

4:00 pm – 5:30 pm CEST Online	Wed 15th, 2021
Microsoft Teams, Session Link: Access the Online Session	
EMSS/MAS: Modeling & Simulation of Manufacturing and Warehousing Processes Chair: Emilio Jemenez, La Rioja University, Spain <ul style="list-style-type: none"> > Lean manufacturing tools for support production process and their impact on economic sustainability (I3M_139) <i>Jorge Luis García- Alcaraz, Adrián Salvador Morales García, José Roberto Díaz Reza, Silvia Paola Audeves Rubio, Emilio Jiménez Macias, Manuel Arnoldo Rodríguez Medina</i> > Role of Lean manufacturing tools on economic sustainability in the Mexican manufacturing industry (I3M_140) <i>José Roberto Díaz Reza, Jorge Luis García-Alcaraz, Manuel Arnoldo Rodríguez Medina, Arturo Realvásquez Vargas, Karina Cecilia Arredondo Soto, Emilio Giménez Macias</i> > Discrete-Event Simulation for Risk Management in the Overlap of Two Offshore Wind Manufacturing Projects (I3M_148) <i>Adolfo Lamas-Rodríguez, Santiago José Tutor-Roca, Belén Sañudo-Costoya</i> > Feasibility of an Origami Pattern Folding for Continuous Manufacturing Process (I3M_136) <i>Prabhu Muthukrishnan, Zbigniew J. Pasek</i> > Queueing, Simulation and Optimization for Performance-oriented Design of Warehouse Systems (I3M_151) <i>Pasquale Legato, Rina Mary Mazza, Francesca Vocaturo</i> > Continual improvement in the insert machining process at a metalworking facility (I3M_81) <i>Jorge Martínez, Ann Wellens</i> 	

4:00 pm – 5:30 pm CEST Online	Wed 15th, 2021
Microsoft Teams, Session Link: Access the Online Session	
EMSS/MAS/HMS: Modelling & Simulation in Supply Chains and Logistics Chair: Adriano Solis, York University, Canada	

- > A Risk Management Framework via Multi-paradigm Simulation for Supply Chain and Business Process Management (I3M_106)
Shayan Mohammadi, Keivan Ghasemi Nodooshan, Konstantinos Mykoniatis
- > Multi-Resolution Localization of Individual Logs in Wooden Piles Utilizing YOLO with Tiling on Client/Server Architectures (I3M_108)
Christoph Praschl, Philipp Auersperg-Castell, Brigitte Forster-Heinlein, Gerald Adam Zwettler
- > RFID and logistics: a cost-benefit analysis to design the most cost-effective RFID set-up for an air cargo handler's warehouse (I3M_174)
Elvezia Maria Cepolina, Donato Aquaro
- > Interoperable Simulation for Space Logistics & Operations for a Moon Base (I3M_162)
Agostino Bruzzone, Kirill Sinelshchikov, Javier Personas, Antonio Giovanetti, Barath Gadupur
- > Verification of a naval logistics planning simulator prototype (I3M_80)
John Richardson
- > Strategic Engineering for Marine Logistics for Chemical Plants (I3M_171)
Elvezia Maria Cepolina

4:00 pm – 5:30 pm CEST Online	Wed 15th, 2021
<p>Microsoft Teams, Session Link:</p> <p>Access the Online Session</p>	
<p>EMSS/MAS/IWISH: Simulation for COVID-19 Countermeasures <i>Chairs: Marco Frascio, University of Genoa, Italy</i></p> <ul style="list-style-type: none"> > Risk Management in the Healthcare Facilities: Case Study (I3M_96) <i>Katerina Vichova, Kamil Peterek, Romana Heinzova, Marek Tomastik</i> > Discrete event simulation of a drive-through COVID-19 mass vaccination model: senior population prioritization strategies (I3M_97) <i>Anastasia Angelopoulou, Sonipriya Paul</i> > Analyzing the Impact of Vaccination on COVID-19 Spread and Hospitalizations: A Multi-Paradigm Simulation Modeling Approach (I3M_133) <i>Julia Bitencourt, Mohsen Nikfar, Konstantinos Mykoniatis</i> > Designing a RFID/IoT prototype for improving COVID19 test centers daily operations (I3M_141) 	

Yasmina Maïzi, Ygal Bendavid

- > Using discrete-event simulation to address COVID-19 health and safety guidelines in outpatient laboratory clinic (I3M_15)

Daniel Zemaitis, Angela Green, Alexandra Mukavitz, Jennifer Dhanapal, Myriah Kahlmorgan, Edward J. Williams

4:00 pm – 5:30 pm CEST

Online

Wed 15th, 2021

Microsoft Teams, Session Link:

[Access the Online Session](#)

Special Session: Smart Operators 4.0 based on Simulation for Industry and Manufacturing Systems

Chair: Francesco Longo, University of Calabria, Italy

This Special Session is dedicated to the SO4SIMS a project, an Italian National R&D project funded under the Italian PRIN Program. The project carried out by research teams belonging to six Italian Universities: the University of Calabria, the Polytechnic of Bari, the University of Basilicata, the University of Salerno, the University of Palermo and the University of Salento.

The main goal of the SO4SIMS project is to carry out R&D activities to move ahead the state of the art in the area of Smart Operators and their role in manufacturing systems according to the new Industry 4.0 paradigm. The SO4SIMS project conceives a holistic methodological and technological framework able to tackle the Smart Operator problem conceptualization and implementation from multiple interconnected perspectives:

- a dedicated Digital Twin for collecting and analyzing the data needed to investigate the Smart Operator problem;
- a set of new models that will consider in a synergic way: the operators' safety and ergonomic problem, the operators' ageing problem and the interaction of the operators with the shop floor technologies (where collaborative environments are needed)
- synthetic, virtual and simulated environment for the Smart Operator.

- > Smart operators in industry 4.0: a human-centered approach to enhance operators' capabilities within cyber-physical production systems (I3M_SS6)

Antonio Padovano

- > The Cognitive Problem for the Smart Operator (I3M_SS7)

Salvatore Digiesi

- > Cooperative Problems for the Smart Operator (I3M_SS8)

Fabio Fruggiero

- > Ergonomics and Safety for the Smart Operator (I3M_SS9)

Giuseppe Aiello

4:00 pm – 5:30 pm CEST Online	Wed 15th, 2021
<p><i>Microsoft Teams, Session Link:</i></p> <div> Access the Online Session </div>	
<p>EMSS/MAS/HMS/DHSS: Modelling & Simulation in Industry and Logistics <i>Chair: Eleonora Bottani, University of Parma, Italy</i></p> <ul style="list-style-type: none"> > Flexible Simulation for Manufacturing & Supply Chain Management (I3M_161) <i>Agostino Bruzzone, Marina Massei, Kirill Sinelshchikov, Marina Cardelli, Marco Frosolini</i> > A simulation of an end-of-life reverse supply chain for electric vehicle batteries (I3M_110) <i>Melissa Venegasa, Andrew Greasley, Aristides Matopoulos</i> > Serious Game for Education and Training of Industrial Plant Managers respect Pandemics (I3M_169) <i>Agostino Bruzzone, Roberto Ferrari, Alberto De Paoli, Alessandro De Gloria, Francesca De Rosa</i> > Approach of flexible log yard design using discrete event simulation (I3M_45) <i>Marta Trzcianowska, Daniel Beaudoin, Luc LeBel</i> > Simulation And Digital Twin Tools For Intelligent Manufacturing: A Case Study (I3M_175) <i>Elvezia Maria Cepolina, Francesco Cepolina</i> > Discrete-event simulation in logistics: a critical review and framework for classification (I3M_125) <i>Michela Tosti, Eleonora Bottani</i> 	

I3M 2021

Activities and Sessions Details

Thursday, September 16th

9:00 am – 10:30 am CEST Online	Thu 16th, 2021
<i>Microsoft Teams, Session Link:</i> Access the Online Session	
EMSS/MAS: Industry 4.0 and Digital Twins Applications <i>Chair: Lin Zhang, Beihang University, China</i> <ul style="list-style-type: none">> A Multi-level Heterogeneous Model data Framework for Intelligent Factory Digital-Twin Systems (I3M_52) <i>Zheng Li, Yusheng Kong, Lei Ren</i>> An approach for target-oriented process analysis for the implementation of Digital Process Optimization Twins in the field of intralogistics (I3M_62) <i>Pascal Zuhr, Konstantin Mühlbauer, Stephanie Bäuml, Sebastian Meißner</i>> Maven: A first step towards a digital twin for synchronous logistics in the automotive industry (I3M_131) <i>Diego Crespo-Pereira, Alexandre Pérez-Rodríguez, Adrián Carballo-Alonso, Diego Costas-Freire, Alejandro Rodal-Salgueiro, Sonia Iglesias-Fernández, David del-Río-Vilas, (h)Andrés Carrillo-Lasheras</i>> Exploiting Machine Learning and Industry 4.0 traceability technologies to re-engineering the seasoning process of traditional Parma's Ham (I3M_58) <i>Davide Mezzogori, Francesco Zammori</i>> Interdisciplinary Innovative Talent Training Method and Practice on Modeling and Simulation for Intelligent Manufacturing (I3M_48) <i>Yuanjun Laili, Lin Zhang, Lei Ren, Lei Wang, Yang Li</i>> A Digital Twin of Intensive Aquabiotechnological Production Based on a Closed Ecosystem Modeling & Simulation (I3M_90)	

Mikhail Zhabitskii, Yuriy Andrienko, Vladimir Malyshev, Svetlana Chuykova, Aleksey Zhosanov

9:00 am – 10:30 am CEST Online	Thu 16th, 2021
Microsoft Teams, Session Link: Access the Online Session	
EMSS/HMS/MAS: Modeling & Simulation in harbours and marine ports applications <i>Chair: Yuri Merkurjev, Riga Technical University, Latvia</i>	
<ul style="list-style-type: none"> > A Model-Driven Design Approach For Ro-Ro And Container Terminals: From Requirements Analysis Down To Simulation Model Implementation (I3M_6) <i>Mohamed Nezar Abourraja, Sebastiaan Meijer, Jaouad Boukachour</i> > Smart container stacking in the yard (I3M_54) <i>Lawrence Henesey, Alexandr Silonosov, Christopher Meyer, Laima Gerlitz</i> > Conceptual development of a probabilistic graphical framework for assessing port resilience (I3M_59) <i>Katherine Smith, Rafael Diaz, Yuzhong Shen, Francesco Longo</i> > Port emergency tourist flows management - experiments with drones and active RFID sensors (I3M_154) <i>Farina A., Frosolini M., Lupi M., Mininno V., Petri M., Pratelli A.</i> > Numerical simulation of liquid tank sloshing and its effects on the stability for one point mooring ship (I3M_26) <i>Li Ren, Hongyu Deng, Liwei Zhang, Dezhi Ning</i> > Improving Safety and Security in Ports and Harbour Plants (I3M_156) <i>Agostino Bruzzone, Marina Massei, Kirill Sinelshchikov</i> 	

9:00 am – 10:30 am CEST Online	Thu 16th, 2021
Microsoft Teams, Session Link: Access the Online Session	
IWISH: Training and Learning in and for Healthcare <i>Chair: Marco Frascio, University of Genoa, Italy</i>	
<ul style="list-style-type: none"> > Digital Learning: Healthcare Training by Tele-simulation and Online Cooperation (I3M_68) 	

Fernando Salvetti, Roxane Gardner, Rebecca Minehart, Barbara Bertagni

- > Crisis Resource Management in Emergency Medicine: an Italian medical students' experience (I3M_123)
Andrea Calandrino, Alessio Riitano, Serena Ricci, Silvia Dibenedetto, Fabio Vento, Giancarlo Torre, Marco Chirico, Giacomo Borgonovo
- > Learning the Robotic Abdominal Wall Surgery: a single center training program for laparo-endoscopic skilled surgeons (I3M_132)
Sara Capoccia Giovannini, Bianca Angelone, Annalisa Barbazza, Alessandro Borelli
- > Mammography CADx System based on Transfer Learning (I3M_134)
J.A. Almaraz-Damian, Oscar Garcia-Avila, Volodymyr Ponomaryov, Rogelio Reyes-Reyes, Clara Cruz-Ramos
- > A Proust-like questionnaire for anatomy distance learning: a report on the experience of the 1st year pharmacy undergraduates (I3M_143)
Katia Cortese, Marco Frascio

9:00 am – 10:30 am CEST

Online

Thu 16th, 2021

Microsoft Teams, Session Link:

[Access the Online Session](#)

Special Session, FELICE: FIEFlexible assembly manufacturing with human-robot Collaboration and digital twin modelS (a H2020 funded project)

Chair: Francesco Longo, University of Calabria

Designing the future of global manufacturing

Modern technology offers the potential to radically change the manufacturing industry around the world. With an ever-growing demand for products and services, a novel approach is required to guide industrial manufacturing into its new era. To that end, the EU-funded FELICE project seeks to develop cutting-edge assembly processes, which will address the industrial needs of the future. Adopting a multidisciplinary approach involving robotics, AI, computer vision, data analytics and process optimization, the goal is to greatly enhance industrial manufacturing by pairing the benefits of automation with the flexibility of human ingenuity. This could greatly improve the interaction between humans and machines, easing the lives of workers and supporting the future of industrial production.

- > The FELICE EU Project (I3M_SS10)
Manolis Lourakis, FORTH
- > The use case at FIAT Research Center (CRF use case), (I3M_SS11)
Felice Tauro, FIAT Research Center (CRF)

- > FELICE: Design of a Data Driven Digital Twin (I3M_SS12)
Antonio Padovano, CAL-TEK & University of Calabria
- > Orchestration of Human-Robot Collaboration (I3M_SS13)
Florian Holzinger, Upper Austria University of Applied Sciences

10:30 am – 11:00 am

Break

11:00 am – 12:30 pm CEST

Online

Thu 16th, 2021

Microsoft Teams, Session Link:

[Access the Online Session](#)

EMSS/MAS: Machine learning, AI & Data Fusion Applications

Chair: Michael Affenzeller, Upper Austria University of Applied Sciences, Austria

- > An integrated framework for co-simulation of white-box models and black-box models (I3M_32)
Wenjia Zhang, Wenzheng Liu, Heming Zhang
- > Comparing Physics Effects through Reinforcement Learning in the ARORA Simulator (I3M_41)
Troyle Thomas, Armando Fandango, Dean Reed, Clive Hoayun, Jonathan Hurter, Alexander Gutierrez, Keith Brawner
- > A Review and Proposal for Developing of Data Fusion Models and Frameworks for Decision Making Systems (I3M_46)
Dmitry Murashov, Alexey Krylov, Valeri Zakharov
- > Forecast of the optimal activation function for the stablecoins using neural network (I3M_105)
Alfredo Enrique Benitez Gasca, Ricardo Torres Mendoza, Jenardo Nosedal-Sanchez
- > Prediction of steel coils mechanical properties and microstructure by using deep learning and advanced data preprocessing techniques (I3M_135)
Marco Vannucci, Valentina Colla, Claudio Mocci, Frenk Van Den Berg, Danique Fintelman, Haibing Yang
- > Machine Learning and Genetic Algorithms to Improve Strategic Retail Management (I3M_157)
Agostino Bruzzone, Kirill Sinelshchikov, Wolfhard Schmidt

11:00 am – 12:30 pm CEST Online	Thu 16th, 2021
Microsoft Teams, Session Link: Access the Online Session	
EMSS: Simulation & I4.0 Enabling Approaches in Aviation and Rail Transport <i>Chairs: Idalia Flores, University of Mexico (Mexico); Miguel Mújica Mota, Amsterdam University of Applied Sciences (Netherlands)</i> <ul style="list-style-type: none"> > Augmented Reality Technology and Its Application in Aviation Industry (I3M_10) <i>Yufen Wu, Yi Lv, Yang Xue, Shuhong Xu</i> > Airport passenger flow prediction using simulation data farming and machine learning (I3M_55) <i>Roberto Salvador Félix Patrón, Paolo Scala, Miguel Mújica Mota, Alejandro Murrieta Mendoza</i> > Opt-Sim approach for the gate allocation problem in covid-19 times (I3M_60) <i>Paolo Scala, Margarita Bagamanova, Miguel Mujica Mota</i> > Investigation of platforms at railway station switch area with regard to capacity using computer simulation (I3M_64) <i>Michael Bažant, Josef Bulíček</i> > Computer Simulation for Calculation of Expected Train Position at GNSS Signal Failure within a Railway Network Model (I3M_87) <i>Jan Fikejz</i> 	

11:00 am – 12:30 pm CEST Online	Thu 16th, 2021
Microsoft Teams, Session Link: Access the Online Session	
IWISH/EMSS: Healthcare general applications <i>Chair: Marco Frascio, University of Genoa, Italy</i> <ul style="list-style-type: none"> > EpiMon: Vision-Based Early Warning System for Monitoring Uprising Epileptic Seizures During Night (I3M_113) <i>Gerald A. Zwettler, Anna Reichhardt, Michael Stradner, Christoph Praschl, Emmanuel Helm</i> > Automated Evaluation of Cell Viability in Microfluidic Spheroid Arrays (I3M_117) <i>Jonas Schurr, Christoph Eilenberger, Peter Ertl, Josef Scharinger, Stephan Winkler</i> > Postural Evaluation and Symptom Acquisition Based on IoT-Driven Multi-Sensor-Fusion (I3M_144) 	

Volkhard Klinger

- > PanaXea: A Framework for the Development and Parametrization of Agent-Based Models (I3M_34)

Dario Panada, Bijan Parsia

11:00 am – 12:30 pm CEST

Online

Thu 16th, 2021

Microsoft Teams, Session Link:

[Access the Online Session](#)

Special Session: Open discussion on "Opportunities for Universities Internationalization: Dual Degree Programs, ERASMUS and other collaboration opportunities"

Chair: Francesco Longo, University of Calabria, Italy; Gianpiero Barbuto, University of Calabria, Italy.

This Special Session is an opportunity to meet colleagues from different Universities and countries and to join a completely open discussion to set-up new collaboration and internationalization opportunities.

As the discussion will be completely open, there are no predefined speakers and there is no need to prepare specific power point presentations. During the session, each attendee will be invited to introduce herself/himself and her/his affiliation as well as to discuss about opportunities to set-up dual degree programs, ERASMUS agreement or other types of collaborations.

12:30 pm – 2:00 pm CEST

Lunch Break

2:00 pm – 3:30 pm CEST

Online

Thu 16th, 2021

Microsoft Teams, Session Link:

[Access the Online Session](#)

EMSS/MAS/HMS: M&S paradigms, verification and validation (Session I)

Chair: Emilio Jemenez, University of La Rioja, Spain

- > Parallel Design Patterns vs Parallel Object Compositions. Two Proposals for Parallelization of the Divide & Conquer Technique (I3M_11)
Mario Rossainz-López, Ivo Pineda-Torres, Bárbara Sánchez-Rinza, Manuel Capel-Tuñón
- > a Conversion Framework of the Continuous Modeling Languages Based on ANTLR4 (I3M_28)

Zhen Chen, Lin Zhang, Xiaohang Wang, Pengfei Gu, Fei Ye

- > Time-to-idle Control Variate Performance in the Single Queue Case (I3M_51)
Andrés Suárez-González, Cándido López-García, José C. López-Ardao, Raúl Rodríguez Rubio, Miguel Rodríguez Pérez
- > Simulation-based sensitivity analysis: Methods and software tools (I3M_53)
Drahomír Novák, David Lehký, Ondřej Slowik
- > Data Value as basis for Human Behavior Modeling (I3M_168)
Agostino Bruzzone, Roberto Ferrari, Alberto De Paoli, Francesco Longo, Giulio Franzinetti

2:00 pm – 3:30 pm CEST

Online

Thu 16th, 2021

Microsoft Teams, Session Link:

[Access the Online Session](#)

EMSS: Simulation & I4.0 Enabling Approaches in Rail and Road Transport

Chairs: Idalia Flores, University of Mexico (Mexico); Miguel Mújica Mota, Amsterdam University of Applied Sciences (Netherlands)

- > Simulations of road traffic at light-controlled intersections (I3M_17)
Antonín Kavička, Roman Diviš, Michael Bažant, Petr Křivka
- > Distance of bus stops from junctions: Simulation assessment (I3M_31)
Zdeňka Stojaspalová, Josef Bulíček
- > Multicriteria evaluation of variants as a decision-making support within rail-traffic simulations (I3M_49)
Zdeněk Novotný, Antonín Kavička
- > Optimization of urban paths in pandemic era (I3M_152)
Luigi Rarità
- > Simulation of Computer Vision Based Sensor System for Autonomous Transport (I3M_67)
Mikhail Gorobetz, Ambuja Bangalore Srinivasa

2:00 pm – 3:30 pm CEST

Online

Thu 16th, 2021

Microsoft Teams, Session Link:

[Access the Online Session](#)

SESDE: Environment & Sustainable Development (Session I)

Chair: Janos Sebestyen Janosy, Centre for Energy Research, Hungary

- > Derivation of Recommendations for Action for Sustainable Development in the Light of the COVID-19 Pandemic (I3M_14)
Karoline König, Maria Drakaki
- > Excel tool to assess the environmental impact of steels based on the composition (I3M_19)
Isabel García Gutiérrez, Daniel Elduque, Carmelo Pina, Rafael Tobajas, Carlos Javierre
- > Circular economy for sustainable building: environmental and economic impacts of a green mortar with foundry sand waste (I3M_92)
Marco Bergonzoni, Riccardo Melloni, Lucia Botti
- > Towards a Greener Europe: Analysis of the SeaBubble waterline in Rotterdam (I3M_99)
Miguel Mujica Mota, Maurice van der Meche
- > Optimization of Complex Thermally Electrically Coupled Buildings using Genetic Programming to Identify Optimal Energy Flow Controllers (I3M_109)
Kathrin Kefer, Patrick Kefer, Roland Hanghofer, Markus Stöger, Bernd Hofer, Michael Affenzeller, Stephan Winkler

2:00 pm – 3:30 pm CEST

Online

Thu 16th, 2021

Microsoft Teams, Session Link:

[Access the Online Session](#)

Special Session: MISS & MSNet Directors' Meeting & I3M 2022

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

This special session is devoted to present the next year edition of I3M that will be held (September 2022) in Rome, Italy. All attendees are invited to join this session as well as to take an active role in the organization of the next year edition of the conference by proposing new tracks and/or special sessions.

The session is also an opportunity for MISS and MS&Net Directors to share news about the activities carried out in their own research centers.

3:30 pm – 4:00 pm

Coffee Break

4:00 pm – 5:30 pm CEST Online	Thu 16th, 2021
Microsoft Teams, Session Link: Access the Online Session	
EMSS/MAS: M&S paradigms, verification and validation (Session II) <i>Chair: Emilio Jemenez, University of La , Spain</i> <ul style="list-style-type: none"> > Computing Similarities Between Virtual Laboratory Experiments Models using Petri Nets (I3M_27) <i>Athanasios Sypsas, Dimitris Kalles</i> > GPSS Studio: Synergy Of Modelling Power And Research Complexity (I3M_89) <i>Vladimir Devyatkov, Timur Devyatkov, Maxim Fedotov</i> > Developing a Bridge from GPenSIM to NuSMV for Model Checking (I3M_111) <i>Albana Roci, Reggie Davidrajuh</i> > A LSTM-based method for simulation execution validity evaluation (I3M_121) <i>YuLun Wang, Wei Li, Jing Li</i> > Serious Game for SWOT Analysis of EPC Main Contractors (I3M_173) <i>Agostino Bruzzone, Marina Massei, Javier Pernas</i> 	

4:00 pm – 5:30 pm CEST Online	Thu 16th, 2021
Microsoft Teams, Session Link: Access the Online Session	
FOODOPS: Food Operations and Processing Modeling & Simulation <i>Chair: Giuseppe Vignali, University of Parma (Italy)</i> <ul style="list-style-type: none"> > Converting a food oven into a thermal sanitizer for Personal Protective Equipment against COVID-19: Computational Fluid Dynamics simulation (I3M_122) <i>Eleonora Bottani, Roberto Montanari, Andrea Volpi, Giulio Di Maria, Federico Solari, Letizia Tebaldi</i> > An economic order interval-based simulation model for perishable products (I3M_128) <i>Roberto Montanari, Eleonora Bottani, Andrea Volpi, Federico Solari, Giorgia Scozzesi</i> > A versatile simulator for defrosting, convective and boiling drying during hot air frying process (I3M_145) <i>Daniel Goujot, Têko Gouyo, Philippe Bohuon, Francis Courtois</i> > Effect of High Pressure Processing on enzymatic activity for strawberries, sour cherries and red grapes (I3M_149) 	

Andres Felipe Moreno Barreto, Giuseppe Vignali, Luca Sandei

- > Agricultural waste as a source of innovative and compostable composite biopolymers for food packaging: a scientific review (I3M_150)

Anna Ronzano, Roberta Stefanini, Giulia Borghesi, Giuseppe Vignali

4:00 pm – 5:30 pm CEST

Online

Thu 16th, 2021

Microsoft Teams, Session Link:

[Access the Online Session](#)

SESDE/MAS: Energy Production, Management and Control

Chair: Janos Sebestyen Janosy, Centre for Energy Research, Hungary

- > Deploying the Smart Energy Tool for Investment Simulation inside the HUBCAP Sandbox (I3M_29)
Andreea Badicu, George Iordache, George Suciu, Hugo Daniel Macedo, Claudio Sassanelli, Sergio Terzi, Peter Gorm Larsen
- > New Intelligent Power Adjustment of the Wind Energy Conversion System Extended Virtual Flux based Direct Power Control Using New Fuzzy-PI Controller (I3M_44)
Zine Hamed Kamel Eddine, Razik Dib, Khoudir Abed
- > Mathematical and numerical investigations of diffusion in silicon based solar cells (I3M_84)
Abderrazzak El Boukili
- > Optimized power plant control via compound modeling of structural integrity and plant dynamics (I3M_147)
Pal Szentannai, Tamás Fekete
- > A new compact training simulator for Paks Nuclear Power Plant (I3M_61)
József Páles, Gábor Házi, Tamás Fogd
- > SURET calculation of a new type of nuclear fuel assembly having spacer grid with mixing vane (I3M_83)
Áron Vécsi, Gábor Házi

4:00 pm – 5:00 pm CEST Online	Thu 16th, 2021
<i>Microsoft Teams, Session Link:</i> Access the Online Session	
Special Session: Strategic Engineering PhD and STRATEGOS <i>Chair: Prof. Agostino G. Bruzzone, University of Genoa, Italy</i> <p>This special session is devoted to present the Strategic Engineering PhD Program and the new Master Degree Program in Strategic Engineering (STRATEGOS) at University of Genoa, Italy. All the attendees are invited to join to know more about these interesting opportunities and to set-up new collaboration within the framework of the Strategic Engineering PhD Program and STRATEGOS Master Degree Program.</p>	

5:00 pm – 5:45 pm CEST Online	Thu 16th, 2021
<i>Microsoft Teams, Session Link:</i> Access the Online Session	
Special Session: Marine Safety and Security and ALACRES2 <i>Chair: Agostino Bruzzone, University of Genoa, Italy</i> <p>This Special Session is completely dedicated to the ALACRES2 project. The Alacres2 project belongs to the family of European Interreg Maritime projects relating to the management of risks in the port environment and the joint improvement of maritime safety. The main objective of this project is the creation of a permanent laboratory capable of identifying, testing and validating the integrated emergency management procedures in the event of significant accidents or crises occurring in the loading and unloading phases of dangerous goods and substances in port areas. This will help in identifying unique management protocols that help in improving the skills of operators in these situations.</p> <p>To achieve this goal, the partners will investigate the behaviour of the various operational figures called to manage emergencies, testing new behavioural protocols, new operating standards, new forms of monitoring and new support technologies.</p> <p>The concept of Extended Maritime Framework and simulation techniques based on the MS2G (Modeling, interoperable Simulation & Serious Games) paradigm are introduced to combine different models, guaranteeing a high level of reliability and, at the same time, ease of use of the ALACRES2 software tools.</p>	

I3M 2021 Awards Ceremony

The I3M 2021 Awards will be delivered in a special online session that will be held on September 16th, at 6 pm.

6:00 pm – 7:00 pm CEST Online	Thu 16th, 2021
<i>Microsoft Teams, Session Link:</i> Access the Online Session	
I3M Awards Ceremony I3M Best Paper Awards The I3M 2021 Best Paper Award is assigned by the I3M 2021 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 2021

Activities and Sessions Details

Friday, September 17th

9:00 am – 10:30 am CEST Online	Fri 17th, 2021
<i>Microsoft Teams, Session Link:</i> Access the Online Session	
EMSS/MAS: M&S applications in different domains (Session I) <i>Chairs: Fabio De Felice, University of Cassino, Italy; Antonella Petrillo, Università degli Studi di Napoli "Parthenope", Italy</i> <ul style="list-style-type: none">> A predictive model for an effective maintenance of hospital critical systems (I3M_4) <i>Marah Al-Tal, Raid Al-Aomar, Jochen Abel</i>> Educational case study: evaluation of guaranteed service on low earth orbit satellite networks (I3M_77) <i>Andrés Suárez-González, Raúl Rodríguez Rubio, José C. López-Ardao, Cándido López-García, Sergio Herrería-Alonso</i>> Implementing the BBE Agent-Based Model of a Sports-Betting Exchanges (I3M_88) <i>Dave Cliff, James Hawkins, James Keen, Roberto Lau-Soto</i>> The Impact of the Constraints of Class Scheduling on Campus Dining: A Simulation-based Case Study (I3M_98) <i>Jeremiah Ivan, Steven Rooney, Hunter Carlson, Spencer Bentley, Derek Fisher, Anastasia Angelopoulou</i>> A Hybrid Multi-Criteria Decision Model (HMCDM) based on AHP and TOPSIS analysis to evaluate Maintenance Strategy (I3M_146) <i>Gianpaolo Di Bona, Domenico Falcone, Antonio Forcina, Luca Silvestri, Filippo De Carlo, Mohammad Mahdi Abaei</i>> Dynamic Problem Solving for Assessment of Strategic Engineering Capabilities (I3M_167) <i>Agostino Bruzzone, Marina Massei, Jan Mazal, Anna Franca Sciomachen</i>	

9:00 am – 10:30 am CEST Online	Fri 17th, 2021
Microsoft Teams, Session Link: Access the Online Session	
IMAACA/MAS: Modeling of Controls Applications Chair: Loucas S. Louca, University of Cyprus, Cyprus <ul style="list-style-type: none"> > Decentralized navigation control of multiple vehicles with obstacle avoidance (I3M_25) <i>M-M.Mohamed-Ahmed, Aziz Naamane</i> > A novel approach to handle intransitive judgements in industrial control problems (I3M_33) <i>Silvia Carpitella, Miroslav Pištěk, Masahiro Inuiguchi, Václav Kratochvíl</i> > Fermentation of glycerol using Clostridium butyricum for the production of 1,3-Propanediol in a Fed-batch bioreactor using advanced controllers (I3M_115) <i>Tomás Pröschle, Diego Ávalos, Alejandro Sepúlveda, Francisco Llull, Francisco Ibáñez, José Ricardo Pérez-Correa</i> > Synthesis of Petri Nets based controllers for the automation of train routing in a railway node (I3M_130) <i>Armand Toguyéni</i> 	

9:00 am – 10:30 am CEST Online	Fri 17th, 2021
Microsoft Teams, Session Link: Access the Online Session	
DHSS: Defense and Homeland Security - Session I Chair: Agostino Bruzzone, University of Genoa, Italy <ul style="list-style-type: none"> > Enhancing the capacity of data collection tools to detect, prepare and respond to emerging CBRNE threats through engaging with end-users (I3M_50) <i>Roberto Mugavero, Pietro Costanzo, William Thorossian</i> > Simulation for Education: Improving Personal Responsiveness in Case of Violent Attack (I3M_63) <i>Lukas Kotek, Dora Kotkova</i> > Conceptual terrorist attacks classification : pre-processing for artificial intelligence-based classification (I3M_65) <i>Oussama Kebir, Issam Nouaouri, Lilia Rejeb, Lamjed Ben Said</i> > Simulation-based training in the use of the EU-SENSE CBRN reconnaissance device: a case study (I3M_107) 	

Małgorzata Gawlik-Kobylińska, Mariusz Urban, Grzegorz Gudzbeler, Andrzej Misiuk

- > Simulation in first-responders training to improve the decision-making process: chemical, biological and radiological weapons in improvised explosive devices at airports (I3M_122)
Mariusz Urban
- > Modeling & Data Fusion to support Acquisition in Defense (I3M_176)
Agostino Bruzzone, Umberto Battista, Federico Taddei Santoni, Giorgio Tardito

9:00 am – 10:30 am CEST

Online

Fri 17th, 2021

Microsoft Teams, Session Link:

[Access the Online Session](#)

EMSS: Modeling and Simulation in Advanced Physics Technologies (Session I)

Chairs: Alexander S. Sigov, Moscow Technological University (MIREA), (Moscow, Russian Federation); Mikhail E. Belkin, Moscow State Technological University (MIREA), (Moscow, Russian Federation)

- > Digital simulators of the random processes (I3M_21)
Oleg Chernoyarov, Alexey Glushkov, Larisa Korableva, Vladimir Litvinenko, Alexander Makarov
- > Statistical simulation of the Gaussian random process parameter estimation (I3M_22)
Oleg Chernoyarov, Larisa Korableva, Yury Korchagin, Alexander Makarov, Michail Turbin
- > The characteristics of the Poisson signal source localization estimates in the regular case and in the presence of the cusp-type and change-point singularities (I3M_23)
Oleg Chernoyarov, Alexander Faulgaber, Yury Kutoyants
- > The Physical Topological Modeling Of Single Radiation Effects in Submicron Ultrahigh-Frequency Semiconductor Diode Structures With Taking In Account The Heating Of An Electron-Hole Gas In The Charged Particle Track (I3M_104)
Elena Tarasova, Alexander Puzanov, Veronica Bibikova, Ekaterina Volkova, Il'Ya Zabavichev, Elizaveta Obolenskaya, Alexander Potekhin, Sergey Obolensky

9:00 am – 10:30 am CEST

Online

Fri 17th, 2021

Microsoft Teams, Session Link:

[Access the Online Session](#)

SESDE: Environment & Sustainable Development (Session II)

Chair: Janos Sebestyen Janosy, Centre for Energy Research, Hungary

- > Risk Analysis for Project Management by Simulation over Large Offshore Projects

(I3M_160)

Agostino Bruzzone, Kirill Sinelshchikov

- > Serious Game for Project Management applied to Large Constructions Plants in Africa (I3M_166)
Agostino Bruzzone, Marina Massei, Javier Pernas, Michele Turi, Paolo di Bella, Alessandro Leto
- > Improving Efficiency and Safety for Heat Exchangers and Water Piping by innovative Solutions (I3M_170)
Agostino Bruzzone, Antonio Giovanetti, Bharath Kumar Gadupuri
- > Simulation as enabler for Engineering Future Smart Grids (I3M_172)
Agostino Bruzzone, Kirill Sinelshchikov, Antonio Giovanetti

10:30 am – 11:00 am CEST

Coffee Break

11:00 am – 12:30 pm CEST

Online

Fri 17th, 2021

Microsoft Teams, Session Link:

[Access the Online Session](#)

EMSS/MAS: M&S applications in different domains (Session II)

Chairs: Fabio De Felice, University of Cassino (Italy); Antonella Petrillo, Università degli Studi di Napoli "Parthenope" (Italy)

- > Forecasting Tourism Demand in Greece Using Time Series Forecasting (I3M_20)
Eleni Saltsidou, Maria Drakaki
- > Analytical Method to Determine the Test Positions for Validation of a Two-Dimensional Shuttle System Model (I3M_18)
Giulia Siciliano, Christian U. Schuster, Johannes Fottner
- > A simulation-based decision-support system for integration of human cognition into construction operation planning (I3M_40)
Alireza Golabchi, SeyedReza RazaviAlavi, Simaan AbouRizk
- > Multidisciplinary design method for product quality based on ResNet50 network (I3M_100)
Guodong Yi, Lifang Yi, Yanwu Feng
- > Autonomous Systems for Industrial Plants and Heavy Industries (I3M_159)
Agostino Bruzzone, Kirill Sinelshchikov, Elvezia Maria Cepolina

- > Models to apply Strategic Engineering at Digitalization Initiatives in Large Engineering Companies (I3M_164)
Agostino Bruzzone, Marina Massei, Mario Lodovico Chervisari, Marina Cardelli, Francesco Faccio

11:00 am – 12:30 pm CEST Online	Fri 18th, 2021
Microsoft Teams, Session Link: Access the Online Session	
Special Session: XR and I4D3A2 Project <i>Chair: Agostino Bruzzone, University of Genoa, Italy</i> <p>This Special Session is devote to present the project I4D3A2 (Immersive, Interoperable, Intuitive, Interactive virtual environment for Developing and Delivering training by simulation to operators in Dangerous Areas & Activities). The project is funded by INAIL (The Italian National Institute for Insurance Against Injuries at Work) and it is leaded by the Simulation Team, University of Genoa, Italy.</p> <p>All the attendees are invited to join to know more about the project and to establish new collaboration opportunities in the I4D3A2 project framework.</p>	

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DHSS: Defense and Homeland Security - Session II <i>Chair: Marina Massei, University of Genoa, Italy; Benjamin Goldberg, US Army DEVCOM Soldier Center, USA</i> <ul style="list-style-type: none"> > Drone detection with YOLOv5 (I3M_30) <i>Jiri Kralicek</i> > Modelling Team Cohesion during Military Conscription: a Multidimensional Model for Task Cohesion (I3M_91) <i>Svajone Bekesiene, Rasa Smaliukiene, Ramute Vaicaitiene</i> > New approaches for security based on the properties of nanodiamonds (I3M_102) <i>Jelena Tamuliene, Svajone Bekesiene and Petr Kubeček</i> > Using System Dynamics approach as decision support tool in fighting against pandemic (I3M_118) 	

Tomasz Zawadzki, Halina Świeboda, Tomasz Wałęcki

- > Pandemics and Crisis (I3M_165)

Agostino Bruzzone, Bharath Kumar Gadupuri, Wolfhard Schmidt, Paolo di Bella, Massimo Pedemonte

11:00 am – 12:30 am CEST

Online

Fri 17th, 2021

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EMSS: Modeling and Simulation in Advanced Physics Technologies (Session II)

Chairs: Mikhail E. Belkin, Alexander S. Sigov, Moscow Technological University, Russian Federation

- > Estimation of optimal positioning of gold contact pads for modulating nanophotonic devices based on lithium niobate on insulator platform (I3M_126)
Ilia Elmanov, Anna Elmanova, Vadim Kovalyuk, Pavel An, Gregory Goltsman
- > Devising a microwave-photonics frequency synthesizer for prospective radar and communication application (I3M_153)
Mikhail E. Belkin, Vladislav Golovin, Yuriy Tyschuk, Alexander S. Sigov
- > Integrated optical gas sensor based on O-ring resonator and loop waveguide mirror on silicon nitride platform (I3M_124)
Anna Elmanova, Ilia Elmanov, Vadim Kovalyuk, Pavel An, Galina Chulkova, Gregory Goltsman

12:30 PM – 1:00 PM CEST

Online

Fri 17th, 2021

Microsoft Teams, Session Link:

[Access the Online Session](#)

I3M 2021 Closing Ceremony

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

All attendees are invited to join the I3M 2021 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 (2022) that will be held in Rome, Italy.

I3M Proceedings Publication

The I3M organization Committee is carrying out a major effort to improve the visibility of the I3M articles.

Therefore, all the I3M proceedings are published as open access and will be available at <https://www.cal-tek.eu/proceedings/>.

The I3M Proceedings will be indexed in SCOPUS and will be also provided with a DOI. The DOI will be also communicated to SCOPUS to allow link connection between the SCOPUS webpage of the article and the webpage where the PDF of the article is available for download.

DOIs coverage for the previous years editions of I3M is ongoing.

International Journal Special Issues

The authors of the best papers submitted and presented at I3M will be invited to extend their work and contribute to Special Issues hosted by the following International Journals.

- **International Journal of Simulation and Process Modeling**
- **International Journal of Food Engineering**
- **International Journal of Privacy and Health Information Management**
- **IEEE Transactions on Engineering Management (IEEE TEM)**
- **Journal of Simulation**



I3M 2021 Authors and Chairs Guideline

Author and Chair Guidelines for the I3M2021 Virtual Conference are available in the conference website at:

www-msc-les.org/conf/i3m2021

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

I3M 2021 as evolving framework

Dear attendee, the 2021 edition of I3M will be completely held online. Please check the website for additional information at:

www.msc-les.org/conf/i3m2021

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

The whole I3M 2021 Organization Committee is glad to see you for this online edition of the conference and for your support to this important event. We really hope you will enjoy the online conference, therefore we are looking forward to further develop and improve it in 2021.

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 2022 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.

WAMS 2021

WAMS 2021, the International Workshop in Applied Modeling & Simulation will be held in Linz (Austria). Please consider to be active and to participate in this thematic workshop. For further information please check the web site:

<http://www.liophant.org/conferences/2021/wams/>

You can also write to Dr. Marina Massei (marina.massei@liophant.org)

ISM 2021

The ISM 2021 will be held in Linz (Austria) and provides a unique opportunity to meet scientists, researchers and company managers who are working in the area of Smart Manufacturing and Industry 4.0. For further information please check the web site:

<http://www.msc-les.org/ism2021>

You can also write to Dr. Antonio Padovano (antonio.padovano@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 2021 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 sponsorship 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