

# FINAL PROGRAM



28-30 October 2019



Palma de Mallorca, Spain

Organized by



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## General Information

### 1. Conference Location

The **ESM'2019 Conference** is being held at



Universitat de les Illes Balears  
Sa Riera Hall  
C/ de Miquel dels Sants Oliver, 2  
07122 Palma, Spain  
Tel:+34 971 17 30 14  
Email: [pilar.fuster@uib.es](mailto:pilar.fuster@uib.es)

**BEWARE SA RIERA HALL IS LOCATED  
IN THE CITY CENTRE NOT ON THE  
UNIVERSITY CAMPUS**

The registration desk will be placed in the hallway downstairs from Monday morning October the 28<sup>th</sup> onwards, where registration will start at 08.15 a.m. and will end at 5.00 p.m. On Tuesday October 29<sup>th</sup> registration will be from 9.00 a.m. - 5.00 p.m. with Wednesday registration only from 9.00 a.m.- 9.30. a.m. The way to the conference and desk will be signposted.

**ALL MAJOR MAPS ARE AT THE BACK OF THIS PROGRAMME**

**How to reach the conference location in Palma de Mallorca:**

#### By Plane

As Palma de Mallorca is a popular tourist destination it is easily reachable by plane from all over Europe. When arriving by plane in Palma de Mallorca, you will land at [Palma de Mallorca Airport](#) located 8 km east of Palma, Majorca, Spain.

The airport consists of four modules:

- **Module A** is located in the north of the airport. It has 28 gates of which 8 have airbridges. This is the only Module that has double airbridges attached to gates. **The Pier is mainly used by flights to non-Schengen destinations including the UK and Ireland.** This part of the terminal building used to be closed during winter months and is only used in the summer. For winter 2018/2019 it will remain open.
- **Module B** is the smallest module, located in the north east. It has 8 gates located on the ground floor, of which none have airbridges. It is used by regional aircraft of [Air Nostrum](#), mainly operating flights to [Ibiza Airport](#), [Menorca Airport](#), [Valencia Airport](#), [Lleida Airport](#), [Asturias Airport](#) and [Santiago de Compostela Airport](#).
- **Module C** is the largest of the Modules located in the east. It has 33 gates of which 9 have airbridges. It is used by [Condor](#) along with [EasyJet](#) and [Norwegian Air Shuttle flights to Schengen destinations](#). The majority of airbridges have airberlin.com written on them.

## General Information

- **Module D** is located in the south. It has 19 gates of which 10 have airbridges. All odd numbered gates are gates with a bus transfer.

From [Palma de Mallorca Airport](#) you can take either bus or taxi to Palma de Mallorca.

**By Bus:** If your choice is using the bus for transportation you will get a bus stop within the airport compound. The airport service bus is route 1. To get to Palma city you will have to part with €1.85 per adult. The buses are available every 15 minutes from 6.10 am to 1.10 am during winter and up to 2.15 am during summer. Different towns have different bus routes to get there.

**By Taxi:** Taxis are available at the taxi ranks outside the arrivals area. Generally, taxi charges are charged per kilometre with a minimum charge. The prices also change depending on the [time of day or whether it is a holiday](#).

**By Car:** There are car hire services available at Palma Airport. In total, there are five companies offering this service. Autos Ancar offers a variety of vehicles to fit a large range of clientele. Similarly, these services can be obtained from Avis, Cicar, Europcar or Hertz. The services are available on arrival at the airport. The hiring price of vehicles ranges from about €140 to €300 per week, depending on your vehicle of choice. The price also varies according to the season.

### By Ferry

You can reach Mallorca from Barcelona, València and Dénia with [Balearia](#), and from Barcelona and València with [Transmediterranea](#). You can also reach Mallorca from Toulon with [Corsica ferries](#).

### By Train and Metro

Mallorca has a small railway service that connects the capital, Palma, with several towns and villages on the island. It's divided into three routes which run between Palma and Inca, Sa Pobla, Manacor, Marratxí, Santa María, Consell, Binissalem, Lloseta, Muro, Sineu and Petra. There are also two metro lines in the city of Palma. Train and metro routes are operated by SFM (Serveis Ferroviaris de Mallorca). All of them depart and end at Palma 'Estació Intermodal', situated in Plaça d'Espanya. Updated information can also be found on the TIB (Transports de les Illes Balears) website.

Train and metro timetables vary depending on the day of the week. Fares depend on the journey as there are four different price zones, with single tickets ranging from €1.60 to €4.10 and return tickets from €3.20 to €8.20. Children under 4 years old travel for free.

You can purchase tickets from the ticket offices and automatic ticket machines at the stations of Palma, Inca and Manacor or from the train

## General Information

conductor. Conductors will have some change so you don't need the exact money but many won't accept a note larger than €20.

Guide dogs are allowed on all trains. Most lines also allow bikes on board, please enquire before boarding the train.

Palma has the shortest metro system in Spain, with just 16 kilometres and 15 stations divided into two lines. Metro services run from 'Estació Intermodal' in Plaça d'Espanya to Palma's northern outskirts. The Palma Metro is a train/metro line serving the Palma city area. It serves nine stations. From the transportation hub of Plaça d'Espanya it passes through Jacint Verdaguer, Son Fortesa - Son Costa, Son Fuster Vell, Son Castello, Gran Via Asima, Cami dels Reis, Son Sardina and Universitat de les Illes Balears. Trains run every 15 to 30 minutes between 06:30 and 22:00 from Monday to Friday. Metro 1 runs from Estació Intermodal to Son Espanyol and the university campus (with service on Saturday mornings). Metro 2 runs from Estació Intermodal to Marratxí.

### By Bus

Palma has its own bus service run by [EMT](#) (look out for the blue buses). You pay for your journey when you get on board - single tickets only (€1.50, or €3 for journeys on line 1 to the port). Drivers won't usually accept a note larger than €10. You can also buy a set of 10 journeys at a discounted rate of €10 in tobacco shops and the EMT office (Josep Anselm Clavé 5, around the corner from Olivar Market).

A night bus runs on Friday and Saturday nights - and on nights before a public holiday (fiesta time!). It starts on Avenida Gabriel Alomar and goes past Plaça Espanya, Avenida Argentina, Passeig Maritim, Port de Palma and Porto Pí roundabout. They run approximately every 25 minutes. Single tickets cost €1.50.

### By Taxi

Taxis in Palma are white cars with a red and yellow stripe across the middle; they display a green light when free. They all have meters and will always use them so you do not need to worry about being overcharged.

The minimum taxi charge is €4,95 from Monday to Friday. All taxi drivers must display their taxi license and number at all times, and the taxi rates are displayed on the inside of the passenger window.

You will usually be able to hail a taxi at any central location and alternatively you can call Taxis Palma Radio for one on +34 971 401 414 or +34 971 400 004 (both lines are open 24 hours a day).

# General Information

## 1. Badges

Each registrant will receive a name badge upon registration. **The badge must be worn, in order to be admitted to the technical sessions, lunches and social event.**

## 2. Tickets

Extra tickets for the social event and lunches are available from the registration desk. Price: (or equivalent in another currency) for extra tickets

Extra conference dinner	€ 60
Extra lunch ticket	€ 25

## 3. Registration

The ESM'2019 Registration Desk will be open for information and registration:

Monday, October 28 ..... 8.15 a.m. to 5.00 p. m.  
Tuesday, October 29 ..... 9.00 a.m. to 5.00 p. m.  
Wednesday, October 30 ..... 9.00 a.m. to 9.30 a.m.

The location of the registration desk will be signposted

## 4. Conference Proceedings

Each fully paid registrant will be provided with a copy of the Conference Proceedings (printed format). **This is NOT applicable to students who are not authors and who have not fully registered.**

(Extra copies are available on a cash and carry basis at special rates during **ESM'2019**)

Price: (or equivalent in another currency) for an extra copy

ESM'2019 Proceedings CASH AND CARRY	€ 50
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## 6. Meeting Rooms and WIFI

The ESM'2019 conference will be held in **rooms designated A (ASSEMBLY HALL), B (CLASSROOM 4)** in this programme.

The way to the rooms will be signposted. WIFI-Internet is available and login information will be available at the conference.

## 7. Need Help?

Please see the conference desk for your questions

## General Information

### 8. Social Event and Lunches

All registrants are invited to

All **Coffee Breaks** are served in Sa Siera Hall, Universitat de les Illes Balears



**Universitat de les Illes  
Balears  
Sa Riera Hall  
C/ de Miquel dels Sants  
Oliver, 2  
07122 Palma, Spain  
Tel: +34 971 17 30 14  
Email: [pilar.fuster@uib.es](mailto:pilar.fuster@uib.es)**

Lunches served on **Monday October 28<sup>th</sup>** at



the **restaurant** of the  
**Hotel Palladium**  
Paseo Mallorca, 40  
07012 Palma de Mallorca  
Spain  
(4 mins to Conference site on foot)

Lunches served on **Tuesday October 29<sup>th</sup>** at



the **restaurant** of the  
**HM Jaime III**  
Paseo Mallorca 14B  
07012 Palma de Mallorca  
Spain  
(5 mins to Conference site on foot)



## General Information

### **The Conference Dinner**

All participants are invited to the conference dinner on **TUESDAY** the **29<sup>th</sup> of October**. As we need to give an exact number of participants we would appreciate **your confirmation at the desk before Monday lunchtime**.

The dinner location will be communicated at the conference.

### **9. Room Legend**

The parallel meeting rooms will be designated **ROOM A (Assembly Hall) and B. (Classroom 4)** Signposts will indicate the room number above each door.

### **10. Best Paper Award**

During the conference the papers, which were accepted as **extended** papers will be judged by the committee and conference participants in order to choose the best paper of the ESM'2019 conference.

**The best paper author of the conference receives a certificate and a free registration to any EUROSIS event held within 2 years after receiving the best paper award. This registration waiver is only VALID FOR 2 YEARS AFTER RECEIPT AND FOR 1 (ONE) PERSON. In case of multiple authors, one (1) author only can use the registration waiver.**

## Session Chairs information

**ALL SESSION CHAIRPERSONS IN THIS PROGRAM ARE PROVISIONAL**

**Session Chairs** are chosen on a voluntary basis by proposals by either authors or local committee members or are appointed by the Track Chairs, General Program Chair or General Conference Chair. They are responsible for their assigned session. They make sure their speakers are available, take care of the timing within the session, chair the discussion after each presentation and introduce each speaker based on the CV's given to them by the authors. **If a session chair is not available then the first author takes on the responsibility to chair** In case they chair a session featuring **extended papers**, then they are required to distribute and collect the reviews of that or those papers at the beginning and end of the session. If they have time they should also indicate in their papers the number of session participants.

**THE NUMBERS NEXT TO THE PRESENTATIONS DENOTE THE PAGE-NUMBERS IN THE PROCEEDINGS. IF NO NUMBERS ARE MENTIONED THEN THIS PAPER IS NOT PUBLISHED IN THE PROCEEDINGS**

**THE AUTHORS WHO ARE UNDERLINED ARE NORMALLY THE PRESENTERS**

**PAPERS IN GREY BOXES ARE THE EXTENDED PAPERS ELIGIBLE FOR THE BEST PAPER AWARD**

**CHECK OUT THE OTHER EUROSIS EVENTS ON OUR WEBSITE:**

<http://www.eurosis.org>

**MONDAY, 28<sup>th</sup> OCTOBER 2019****08.15-17.00 REGISTRATION IN THE HALLWAY****09.00-09.30 WELCOME BY PILAR FUSTER-PARRA – ESM'2019 CONFERENCE CHAIR - ROOM A – ASSEMBLY HALL****09.30-10.30 KEYNOTE SPEECH BY JOSE MERIGÓ - ROOM A – ASSEMBLY HALL****10.30-11.00 COFFEE BREAK****11.00-13.00 PARALLEL SESSIONS****ROOM A  
ASSEMBLY HALL****ROOM B  
CLASSROOM 4****AI BASED  
DATA  
ANALYSIS****ENGINEERING  
SIMULATION****13.00-14.00 LUNCH BREAK****14.00-15.00 PARALLEL SESSIONS****ROOM A  
ASSEMBLY HALL****ROOM B  
CLASSROOM 4****FINANCIAL  
DATA SIMULATION  
I****LOGISTICS  
SIMULATION  
I****15.00-15.30 COFFEE BREAK****15.30-17.30 PARALLEL SESSIONS****ROOM A  
ASSEMBLY HALL****ROOM B  
CLASSROOM 4****FINANCIAL  
DATA SIMULATION  
II****LOGISTICS  
SIMULATION  
II****17.30-..... FREE EVENING**

**TUESDAY, 29<sup>th</sup> OCTOBER 2019**

09.00-17.00	<b>REGISTRATION</b>	
09.30-10.30	<b>KEYNOTE ADDRESS BY JOSÉ JAVIER RAMASCO ROOM A - ASSEMBLY HALL</b>	
10.30-11.00	<b>COFFEE BREAK</b>	
11.00-13.00	<b>PARALLEL SESSIONS</b>	
	<b>ROOM A ASSEMBLY HALL</b>	<b>ROOM B CLASSROOM 4</b>
	<b>INTERNET OF THINGS</b>	<b>ANALYTICAL, NUMERICAL AND PARALLEL SIMULATION</b>
13.00-14.00	<b>LUNCH BREAK</b>	
14.00-15.00	<b>PARALLEL SESSIONS</b>	
	<b>ROOM A ASSEMBLY HALL</b>	<b>ROOM B CLASSROOM 4</b>
	<b>TUTORIAL JANOSY JANOS SEBESTYEN</b>	<b>MEDICAL SIMULATION I</b>
15.00-15.30	<b>COFFEE BREAK</b>	
15.30-17.30	<b>PARALLEL SESSIONS</b>	
	<b>ROOM A ASSEMBLY HALL</b>	<b>ROOM B CLASSROOM 4</b>
	<b>SMART GRID AND CLOUD SIMULATION</b>	<b>MEDICAL SIMULATION II</b>
19.30 – 22.30	<b>CONFERENCE DINNER</b>	

**WEDNESDAY, 30<sup>th</sup> OCTOBER 2019**

09.00-09.30	<b>REGISTRATION</b>	
09.30-10.30	<b>PARALLEL SESSIONS</b>	
	<b>ROOM A ASSEMBLY HALL</b>	<b>ROOM B CLASSROOM 4</b>
	<b>KEYNOTE SPEECH JOSE GUERRERO</b>	<b>SIMULATION OPTIMIZATION</b>
10.30-11.00	<b>COFFEE BREAK</b>	
11.00 13.00	<b>PARALLEL SESSIONS</b>	
	<b>ROOM A ASSEMBLY HALL</b>	<b>ROOM B CLASSROOM 4</b>
	<b>SIMULATION USING FUZZY ALGORITHMS</b>	<b>ENVIRONMENTAL AND POPULATION DYNAMICS SIMULATION</b>
13.00-13.15	<b>CLOSING SESSION AND BEST PAPER AWARD ROOM A – ASSEMBLY HALL</b>	

# Notes

**NOTES**

**Monday, 28<sup>th</sup> October 2019**

**HALLWAY**

**Registration**

**08.15 - 17.00**

**ROOM A – ASSEMBLY HALL**

**09.00 – 09.30**

**Opening ESM'2019 and Welcome**

**Welcome Address**

Pilar Fuster-Parra, Universitat de les Illes Balears, Palma de Mallorca, Spain

**ESM'2019 General Conference Chair**

**ROOM A – ASSEMBLY HALL - 09.30-10.30**

**KEY**

**KEYNOTE SPEAKER**

**Chair: Pilar Fuster-Parra, UIB, Palma de Mallorca, Spain**



**KEY\_01**

**[The ordered weighted Average: Theory and Applications](#)**

José M. Merigó, University of Chile and University of Technology (Sydney)

Welcome

## Monday, 28<sup>th</sup> October 2019

**10.30 - 11.00**  
**COFFEE BREAK**

**11.00 – 13.00**

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**ROOM A – ASSEMBLY HALL - 11.00-13.00** **AI**  
**AI-BASED DATA ANALYSIS**  
**Chair:** Pilar Fuster-Parra, UIB, Palma de Mallorca, Spain

**AGENT\_03**  
**Multi-Agent Solution for a Distributed Intelligent Photo Fixation**  
Anton Ivaschenko, Arkady Krivosheev and Pavel Sitnikov ..... 73

**AI\_01**  
**Fault Detection of Elevator System Using Profile Extraction and Deep Autoencoder Feature Extraction**  
 Krishna Mohan Mishra, John-Eric Saxen, Jerker Bjorkqvist and Kalevi J. Huhtala..... 79

**AI\_02**  
**Predicting Motor Policy Loss – A ZAIG Model or a Two Stage Neural Network Approach?**  
 Luke Aarohi and David Suda ..... 84

**FUZ\_02**  
**On Aggregation of Generalized Distances and an Application to Analysis of Algorithms**  
José Guerrero, Juan-José Miñana and Óscar Valero..... 45

**N\_01**  
**The Evolution of Artificial Intelligence towards Autonomous Systems with Personality Simulation**  
 Joël Colloc..... 61

**ROOM B – CLASSROOM 4 - 11.00-13.00** **ENG**  
**ENGINEERING SIMULATION**  
**Chair:** Antoni Burguera, UIB, Palma de Mallorca, Spain

**ENG\_04\_PAR**  
**Classification of Electrical Power Peaks of Parallel Operating Machines**  
Armin Siegel ..... 239



# Monday, 28<sup>th</sup> October 2019

## ENG\_02

### Application of Machine Learning to model a Biological Reactor in a Wastewater Treatment Plant

Jan Studziński and Andrzej Ziółkowski ..... 246

## METH\_06\_PAR

### Analyzing the Coupling Process of Distributed Mixed Real-Virtual Prototypes

Peter Baumann, Oliver Kotte, Lars Mikelsons and Dieter Schramm..... 251

## TOOLS\_03\_VR

### Virtual Reality for a Realistic Simulation with Dynamic Motion Platforms

E. Thöndel ..... 259

13.00 - 14.00

LUNCH BREAK

14.00 – 15.00

**ROOM A – ASSEMBLY HALL - 14.00-15.00**

**FIN**

**FINANCIAL DATA SIMULATION I**

Chair: Pilar Fuster-Parra, UIB, Palma de Mallorca, Spain

## METH\_04

### Information Technology for Structural Flowsheet Synthesis, based on the Constraint Satisfaction Methods

Alexander Zuenko, Andrey Oleynik, Yurii Oleynik, Valeriy Birukov and Roman Nikitin ..... 129

## METH\_01

### Improvement of Commercial Activities through a better Identification of Exporting Companies using unstructured Data

Kenneth Van den Bergh, Dries Van Nieuwenhuysse, Younes Ghammad, Andres Van Rompaey and Lode Vermeersch ..... 134

**ROOM B – CLASSROOM 4 - 14.00-15.00**

**LOGIS**

**LOGISTICS SIMULATION I**

Chair: Gerrit Janssens, Hasselt University, Hasselt, Belgium

## Monday, 28<sup>th</sup> October 2019

### METH\_02\_AGENT

Application of a Mixed Simulation Methods in Modelling Port-Traffic within Congested Areas

Ehiagwina O. Augustine ..... 267

### OPT\_01

Dynamic Schedule Execution to Improve Adult Emergency Department Performance in Real Time

Sarah Ben Othman, Slim Hammadi, Hayfa Zgaya, Jean-Marie Renard and Mariagrazia Dotoli..... 272

15.00 - 15.30

COFFEE BREAK

15.30 – 17.30

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**ROOM A – ASSEMBLY HALL - 15.30-17.30**

**FIN**

**FINANCIAL DATA SIMULATION II**

Chair: Juan-José Miñana, UIB, Palma de Mallorca, Spain

### METH\_03

KSU-STEM Approach and its Possible Algorithmic Revisions verified in a Portfolio Selection Process

Adam Borovička ..... 139

### FUZ\_07

Wavelet Theory: for Economic & Financial Cycles

Farai F. Mlambo and Igor N. Litvine ..... 148

### FIN\_01

Optimal Dating of Cycles

Alpheus Mahoya and Igor Litvine ..... 159

### FIN\_03

Markets Trend Assessment using Natural Language Processing

Justin Mudzimu and Igor Litvine ..... 164

# Monday, 28<sup>th</sup> October 2019

**ROOM B- CLASSROOM 4 - 15.30-17.30** **LOGIS**  
**LOGISTICS SIMULATION II**  
**Chair:** José Javier Ramasco, UIB, Palma de Mallorca, Spain

**RAND\_01\_LOGIS**

**Using Discrete Event Simulation to Explore the Impact of User Behaviours on the Effectiveness of a Terminal Appointment System**

Mihai Neagoe, Mohammad Sadegh Taskhiri, Paul Turner

and Hans-Henrik Hvolby ..... 279

**LOGIS\_01**

**An Approximate Inference Approach for Automated Supply Chain Formation**

Florina Livia Covaci ..... 284

**ENG\_01**

**The Effects of Storage Assignment and Order Batching Intensities on Picker Blocking in Narrow-Aisle Order Picking Systems**

Dirk Kauke and Johannes Fottner ..... 290

**ENG\_06\_LOGIS**

**Inventory Management facing Intermittent Demand via the Compound Poisson Distribution**

Lotte Verdonck, Katrien Ramaekers and Gerrit K. Janssens ..... 295

**17.30-.....**

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**17.30 - .....  
FREE EVENING**

## Tuesday, 29<sup>th</sup> October 2019

### HALLWAY

Registration

09.00 - 17.00

09.30 – 10.30

ROOM A- ASSEMBLY HALL- 09.30-10.30

KEY

KEYNOTE

Chair: Óscar Valero, UIB, Palma de Mallorca, Spain



KEY\_02

[Mobile Phone Records to feed Activity-based Travel Demand Models](#)

José Javier Ramasco, (IFISC, UIB), Palma de Mallorca, Spain

10.30 - 11.00

COFFEE BREAK

11.00 - 13.00

ROOM A- ASSEMBLY HALL - 11.00-13.00

NET

INTERNET OF THINGS

Chair: Jan Studzinski, Systems Res. Institute, Warsaw, Poland

IOT\_01

**Dynamic Anomaly Detection based on Recursive Independent Component Analysis of Multi-Variate Residual Signals**

Edwin Lughofer, Mahardhika Pratama, Christian Eitzinger

and Thomas Radauer ..... 105

# Tuesday, 29<sup>th</sup> October 2019

## IOT\_02

### Regression Analysis on Data Received from Modular IOT System

Kristina I. Dineva and Tatiana V. Atanasova ..... 114

## IOT\_03

### Web-based Platform for Collaborative Model-Driven Software Development for IoT Devices

Imen Ben Ida, Mortadha Dahmani, Mohamed Ghazel and Abderrazek Jemai..... 119

## EDU\_01\_VR

### An Overview of Virtual and Augmented Realities in STEM Education

Plamen D. Petrov and Tatiana V. Atanasova ..... 123

## ROOM B- CLASSROOM 4 - 11.00-13.00

## METH

### ANALYTICAL, NUMERICAL AND PARALLEL SIMULATION

**Chair:** Nina Kargapolova, SB RAS and Novosibirsk State University, Novosibirsk, Russia

## ANMT\_01

### Applying Homotopy Perturbation Method to Non-Linear Differential Equations

Linus Petkevičius..... 5

## ANMT\_02

### Observability of Virtual Stochastic Sensors: Observability Type 1

Pascal Krenckel, Claudia Krull and Graham Horton ..... 8

## PAR\_01

### A Concurrent Multi-Tier Priority Queue for Multithreaded Optimistic Parallel Discrete Event Simulation

Matthew DePero and Dhananjai M. Rao ..... 31

## TOOLS\_05

### Parallel Verification Methodology of Reconfigurable Hierarchical Timed Automata

Roufaida Bettira, Laid Kahloul and Mohamed Khalgui ..... 36

13.00 – 14.00

LUNCH BREAK

## Tuesday, 29<sup>th</sup> October 2019

14.00 - 15.00

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**ROOM A – ASSEMBLY HALL - 14.00-15.00** **TUT**  
**TUTORIAL**

**Chair:** Carles Mulet, UIB, Palma de Mallorca, Spain



**TUT\_01**

[Consolidating unpredictable power sources - SMARTGRID](#)

Janos Sebestyen Janosy, Centre for Energy Research,  
Hungarian Academy of Sciences, Budapest, Hungary

**ROOM B – CLASSROOM 4 - 14.00-15.00** **MED**  
**MEDICAL SIMULATION I**

**Chair:** Óscar Valero, UIB, Palma de Mallorca, Spain

**FUZ\_05**

**Finding an Agreement with Midpoints between Fuzzy Sets in Medicine**

Pilar Fuster-Parra, Javier Martín, Beatriz Romero-Ferrando

and Óscar Valero..... 211

**FUZ\_01**

**Using Machine Learning and Heart Rate Variability Features to Predict Epileptic Seizures**

Antoni Burquera..... 217

15.00 - 15.30

**COFFEE BREAK**

# Tuesday, 29<sup>th</sup> October 2019

15.30 - 17.30

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## ROOM A – ASSEMBLY HALL - 15.30-17.30

GRID

### SMART GRID AND CLOUD SIMULATION

Chair: Janos Janosy Sebestyen, Hungarian Acad. of Sci, Budapest, Hungary

#### OPT\_05\_PRED

##### An Optimized Linear Regression Machine for Prediction and Integration of Renewable Sources in Smart Grid

Leila Ziouche, Syrine Ben Meskina, Mohamed Khalgui and Laid Kahloul ..... 171

#### AGENT\_05

##### Multi Agent System Based Approach for enhancing Cyber-Physical Security in Smart Grids

Ilyes Naidji, Moncef Ben Smida, Mohamed Khalgui and Abdelmalik Bachir..... 177

#### CLOUD\_01

##### Public Cloud Data Storage and Retrieval Security

Sonia Amamou, Zied Trifa and Maher Khmakhem ..... 93

#### PETRI\_01

##### R-TNCES Verification: Distributed State Space Analysis performed in a Cloud based Architecture

Chams Eddine Choucha, Naima Souad Ougouti, Mohamed Khalgui, and Laid Kahloul..... 96

## ROOM B – CLASSROOM 4 - 15.30-17.00

MED

### MEDICAL SIMULATION II

Chair: Pilar Fuster-Parra, UIB, Palma de Mallorca, Spain

#### BIO\_02

##### Model Based Evaluation of Integrated Care in Heart Failure Treatment

Alexander Lassnig, Theresa Rienmüller, Christian Baumgartner and Jörg Schröttner ..... 222

#### BIO\_04

##### Modeling and Optimization of Combined Chemo-Radiotherapy

Andrzej Swierniak, Jaroslaw Smieja, Krzysztof Fajarewicz and Rafal Suwinski ..... 226

## Tuesday, 29<sup>th</sup> October 2019

### BIO\_03

#### **On using EEG Signals for Emotion Modeling and Biometrics**

Miguel Arevalillo-Herráez, Guilherme Chicote-Huete, Francesc J. Ferri,  
Aladdin Ayesh, Jesús G. Boticario, Stamos Katsigiannis, Naeem Ramzan  
and Pablo Arnau-González..... 229

### BIO\_01

#### **Mathematical Modelling of the Response of Male and Female Subjects to Vibration under Whole Body Vibration Training Conditions**

Naser Nawayseh and Sadeque Hamdan..... 234

**19.30 - 22.30**

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### **CONFERENCE DINNER – 19.30 -22.30**

All registered participants are invited to the conference dinner, which will be held from 19.30 to 22.30. As we need to give an exact number of participants we would appreciate your confirmation at the desk before Monday lunchtime.

The dinner location will be communicated at the conference.



# Wednesday, 30<sup>th</sup> October 2019

## HALLWAY

Registration

09.00 - 09.30

09.30 – 10.30

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**ROOM A – ASSEMBLY HALL - 09.30-10.30**

**KEY**

**KEYNOTE SPEAKER**

**Chair:** Carles Mulet, UIB, Palma de Mallorca, Spain



**KEY\_03**

[New Framework for Multi-Agent Systems: A Possibilistic Viewpoint](#)

José Guerrero, Dep. of Mathematics and Computer Science,  
Universitat de les Illes Balears, Palma de Mallorca, Spain

**ROOM B – CLASSROOM 4 - 09.30-10.30**

**OPT**

**SIMULATION OPTIMIZATION**

**Chair:** Philippe Geril, ETI, Ostend, Belgium

**OPT\_03**

**One Difficult Optimization Problem and One Impossible One plus Goal Programming**

William Conley..... 15

**OPT\_04**

**Statistical Optimization with Balancing Weights and a Mode of Three**

William Conley..... 21

10.30 - 11.00

**COFFEE BREAK**

## Wednesday, 30<sup>th</sup> October 2019

11.00 – 12.00

**ROOM A – ASSEMBLY HALL - 11.00-12.00** **AI**  
**SIMULATION USING FUZZY ALGORITHMS**  
 Chair: José Guerrero, UIB, Palma de Mallorca, Spain

**FUZ\_04**  
**A Modification of OWD Aggregation Operator and Its Application to K-Means Algorithm**  
Juan-José Miñana, Mateu Morro and Óscar Valero ..... **48**

**METH\_08**  
**Recursive Algorithms for the Generalized Vandermonde Matrix Determinants**  
Jerzy S. Respondek..... **53**

**ROOM B – CLASSROOM 4 - 11.00-13.00** **ENV**  
**ENVIRONMENTAL AND POPULATION DYNAMICS SIMULATION**  
 Chair: Carles Mulet, UIB, Palma de Mallorca, Spain

**ANMT\_04**  
**Stochastic Model of the Time Series of the Average Daily Bioclimatic Index of Severity of Climatic Regime**  
Nina A. Kargapolova..... **185**

**BIO\_06\_ENV**  
**Evaluation of Algorithms for Forecasting of Insect Populations**  
Matthias Becker..... **190**

**AGENT\_01**  
**Degree Centrality and the Probability of an Infectious Disease Outbreak in Towns within a Region**  
Elizabeth Hunter, John Kelleher and Brian Mac Namee..... **195**

**Wednesday, 30<sup>th</sup> October 2019**

**HUMSIM\_03**

**The Possibilities of Simulation in the Field of Preparation for dealing  
with Hybrid Threats**

Michaela Jánošíková, Jozef Ristvej, Maroš Lacinák and Michaela Kollárová..... **203**

**ROOM A – ASSEMBLY HALL - 13.00 - 13.15**

**BEST PAPER**

**CLOSING SESSION AND BEST PAPER AWARD**

**Chair:** Pilar Fuster-Parra, Universitat de les Illes Balears, Palma de Mallorca, Spain

Pilar Fuster-Parra, Universitat de les Illes Balears, Palma de Mallorca, Spain

Philippe Geril, EUROSIS, Ostend, Belgium

**Sessions - Wednesday**

## ESM'2020



**SEE YOU ALL AT  
ESM'2020, October 2020**

**(exact dates to be confirmed shortly)**

**Toulouse, France**

**Track proposals and tutorial proposals can be sent in by  
January 30<sup>th</sup>, 2020**

**Proposals for future ESM locations can be emailed to  
[philippe.geril@eurosis.org](mailto:philippe.geril@eurosis.org)**

**Other upcoming EUROSIS conferences**

**[SCIFI-IT'2020](#), March 23-25, 2020, De Krook, Ghent, Belgium  
[FOODSIM'2020](#), April 6-9, 2020, [University of Leuven Research Centre](#), Ghent, Belgium**

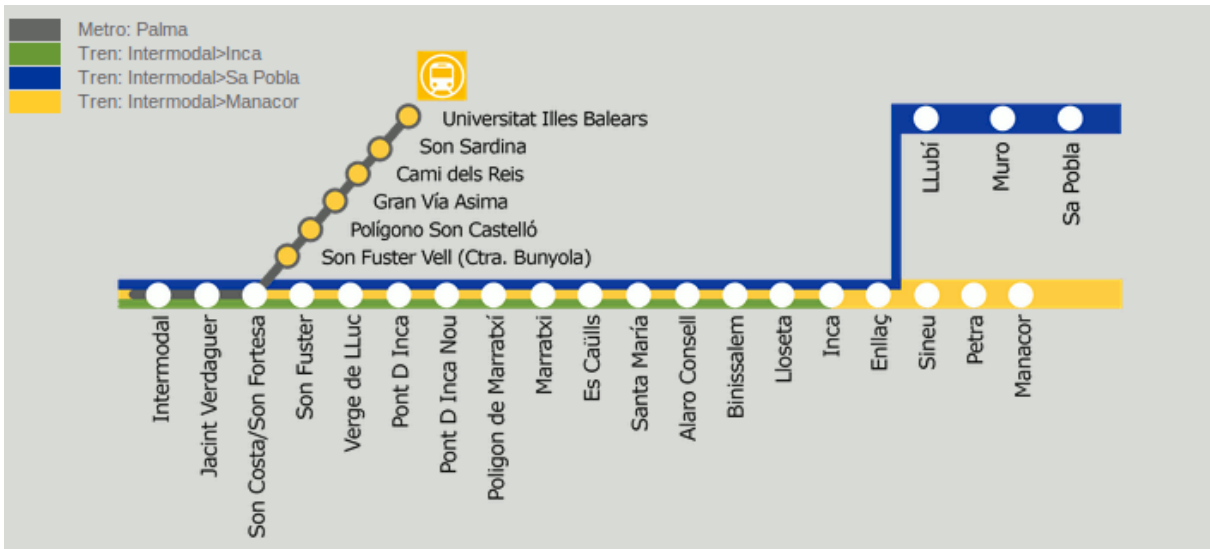
**[ISC'2020](#), June 8-10, 2020, [UCD Dublin](#), Ireland**

**GAME-ON'2020, September 23-25, 2020, Department of  
Communication and Art, University of Aveiro, Aveiro, Portugal  
MESM'2020 – GAME-ON ARABIA'2020, November 2020, American  
University of Sharjah, UAE**

**ISC'2021, June 2-4, 2021, University of Malta, Valletta, Malta  
ESM'2021, October 2021, Link Campus University, Rome, Italy**

# Conference Site Maps

## Mallorca Train Metro Maps





EUROSIS was borne out of discussions with the European Community to set up a new kind of Society, which would be project-driven instead of driven by pure membership and conferences.

The aim of the Society is to set up and manage topic related Technical Committees which will link directly to European Projects in the field of computer simulation and related areas and to act as a knowledge pool for future European Networks of Excellence, like MOSAIC, HORIZON2020 by seeking out the latest innovations in simulation, modelling and AI research.

If you would like to receive more information about EUROSIS, please contact

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