

# Final Program



**June 5-7, 2019**

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## General Information

### 1.1 Conference Location

The Conference is held at



[Instituto Superior de Engenharia de Lisboa](#)  
**Auditorium A - Main Building (Ground floor)**  
 R. Conselheiro Emídio Navarro 1,  
 1959-007 Lisboa, Portugal  
 +351 21 831 7000  
[icalado@dem.isel.ipl.pt](mailto:icalado@dem.isel.ipl.pt)

ISEL is located in the eastern part of Lisbon in the vicinity of the [Gare do Oriente and the Feira internacional de Lisboa](#). At ISEL itself you can find the conference building using the [interactive map](#).

**The meeting room for the ISC'2019 conference, is the Auditorium A - Main Building (Ground floor).** Registration will start on Wednesday at 8.30 a.m. till 15.30 p.m. On Thursday it will be from 8.30 a.m. – 15.00. On Friday it will be from 09.00 a.m. to 09.30 a.m.

### 1.2 Getting to Lisbon and ISEL

#### By Plane

Lisbon's [Portela Airport](#) - (other [website](#)) is located within the city limits. It is the headquarters and hub for TAP Portugal as well as a hub for Easyjet, SATA International, Luzair, EuroAtlantic Airways, Portugália, White Airways, and High Fly airlines

**Bus from Airport** There is a bus network from the airport that offers services to passengers who are travelling to various destinations from the airport. For passengers heading for [Cais do Sodre Railway Station](#) the No. 91 bus service offered by Carris is the bus for you. There are also other bus routes operating from the airport heading to various locations within the city. A ticket to the city center should cost €1.35. One also has an option of purchasing an all day ticket at €3.35. - [AEROBUS](#): Linking the Airport to downtown Lisbon and Cais do Sodre (every 20 minutes from 7 a.m. to 9 p.m.) - [CARRIS BUSES](#): No. 5, 8, 22, 44, 45, 83;

**Taxi from Airport** Outside the terminal buildings one is able to obtain taxi services. These generally charge an average of €15 to the city center. Some of the taxis have meters in them. They charge a minimum of €2.35 during the day and €2.50 at night. Though some of the taxi drivers may take longer routes to keep the meter running, the trip should take an average of 15 minutes to the city center.

## General Information

**Metro from the Airport** There is a direct metroline from the Airport to the Gare do Oriente trainstation and then on to Olivais and Chelas metro stations

### By Train

There are four commuter train lines arriving in Lisbon: the Cascais, Sintra and Azambuja lines (operated by CP - Comboios de Portugal), as well as a fourth line to Setúbal (operated by Fertagus) crossing the Tagus river, over the 25 de Abril Bridge. The major railway stations are [Santa Apolónia](#), Rossio, [Gare do Oriente trainstation](#), Entrecampos, and [Cais do Sodre Railway Station](#). You can download the train link map [here](#).

### By Metro

Another great way of getting around Lisbon is by [Metro](#). (see the [zoomable metro map](#)). The closest stops to ISEL are [Olivais Metro Station](#) and [Chelas Metro Station](#) or you can download the map [here](#).

### By Tram

The current lines are: 12 - Praça da Figueira - Miradouro de Santa Luzia circular route 15 - Praça da Figueira - Algés 18 - Cais do Sodré railway station - Cemitério Ajuda 25 - R. Alfândega - Campo de Ourique 28 - Praça Martim Moniz - Chiado - Campo de Ourique The five remaining lines only operate in the southern centre and west of the city. Despite the relevant tourist attraction, those lines are still very important because of sections of the city's topography that can only be crossed by small trams. Tram 15 also connects the entire western river front of the city to the centre and allows a better flow of passengers with the bus system towards an area that still is not served by the metro.

### By Bus

The closest bus stop to ISEL is at the Rua Conselheiro Emídio Navarro. Busses for this stop are from [CARRIS BUSES](#). You can follow the bus connections at ISEL in realtime [here](#).

## 1.3 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.

## General Information

### 1.4 Tickets/Badges

Extra tickets/badges for the social event and lunches are available from the Registration desk. (**at conference prices**)

Price: (or equivalent in another currency) for extra tickets. All participants will be issued with tickets for lunch and the conference dinner. **Or just the badge will apply.**

conference dinner:	€ 45
lunch	€ 15/lunch

### 1.5 Registration

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

**Wednesday, June 5.....8.30 a.m. to 15.30 p. m.**

**Thursday, June 6.....8.30 a.m. to 15.00**

**Friday, June 7.....9.00 a.m. to 9.30 a. m.**

### 1.6 Conference Proceedings

Each fully paid registrant will be provided with a copy of the Conference Proceedings (printed format). (Extra copies are available on a **cash and carry** basis at special rates during **ISC-2019**)

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

ISC'2019 Proceedings	€ 35
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Other Proceedings can be ordered using the forms available on this link:

<https://www.eurosis.org/cms/?q=taxonomy/term/58>

### 1.7 Meeting Room

The **ISC'2019** meeting room is **Auditorium A - Main Building (Ground floor)**. Directions to the room will be signposted.

### 1.8 Internet Connection

**There is full free WIFI at the conference site.**

User: isc@isel.local

Password: ISC2019

## General Information

### 1.9 Need Help?

Please see the conference desk for your questions

### 1.10 Social Events and Lunches

All registrants are invited:



To the **Coffee Breaks** and the **lunches (Lunches - Wednesday and Thursday)** which will be served at the restaurant of the [Instituto Superior de Engenharia de Lisboa](http://www.iseq.uplisboa.pt).

To the **Conference Dinner**



The conference dinner will be held on Thursday the 6th of June at 8.00 p.m  
[Restaurante Chimarrão - Parque das Nações](http://www.chimarrao.pt)  
Alameda dos Oceanos  
P 2.11 R/C, Fracção A, Edifício Lisboa  
1900-231 Lisboa, Portugal  
✉ Email: [expo@chimarrao.pt](mailto:expo@chimarrao.pt)  
☎ Tel: +351 21 002 6600

### 1.11 Best Paper Award

During the conference the papers, which were accepted as extended papers will be judged by the committee and participants in order to choose the best paper of the **ISC'2019** conference. The best paper candidate receives a certificate signed by the General Conference and Program Chairs and also a free registration to any EUROSIS conference within 2 years of receipt of the prize.

### 1.12 Paper Legend

Each paper is designated before each paper by its number. This number has to be entered on the form for the best paper award

## General Information

### **SESSION CHAIRPERSONS**

**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**

**Sessions with extended papers:** If you are a session chair in a session with extended papers make sure the session participants have a copy of the best paper award form and ask them to return them to you at the end of the session. After the session hand over the collected forms to Philippe Geril

**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**

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

**The room has an LCD projector**



**WEDNESDAY, 5<sup>th</sup> JUNE 2019**

<b>08.30-15.30</b>	<b>REGISTRATION</b>
<b>09.00-09.15</b>	<b>OPENING SESSION WELCOME</b>
<b>09.15-10.00</b>	<b>MEETING ROOM</b>
	<b>KEYNOTE ADDRESS BY HELDER COELHO</b>
<b>10.00-10.30</b>	<b>COFFEE BREAK</b>
<b>10.30-12.30</b>	<b>SESSION</b>
	<b>MEETING ROOM</b>
	<b>MARKET ANALYSIS AND DECISION MANAGEMENT SIMULATION</b>
<b>12.30-14.00</b>	<b>LUNCH BREAK</b>
<b>14.00-15.00</b>	<b>SESSION</b>
	<b>MEETING ROOM</b>
	<b>DATAMINING FORECASTING AND DATA CONSTRUCTS</b>
<b>15.00-15.30</b>	<b>COFFEE BREAK</b>
<b>15.30-17.00</b>	<b>SESSION</b>
	<b>MEETING ROOM</b>
	<b>TRAFFIC SIMULATION AND URBAN MOBILITY</b>
<b>17.00</b>	<b>FREE EVENING</b>

<b>THURSDAY, 6<sup>TH</sup> JUNE 2019</b>	
<b>08.30-15.00</b>	<b>REGISTRATION</b>
<b>09.00-10.00</b>	<b>MEETING ROOM</b>
	<b>KEYNOTE ADDRESS BY LARS MOENCH</b>
<b>10.00-10.30</b>	<b>COFFEE BREAK</b>
<b>10.30-12.30</b>	<b>SESSION</b>
	<b>MEETING ROOM</b>
	<b>AUTOMATION/ROBOTICS AND DIGITAL TWINS</b>
<b>12.30-14.00</b>	<b>LUNCH</b>
<b>14.00-15.00</b>	<b>SESSION</b>
	<b>MEETING ROOM</b>
	<b>ENGINEERING SIMULATION</b>
<b>15.00-15.30</b>	<b>COFFEE BREAK</b>
<b>15.30-17.30</b>	<b>SESSION</b>
	<b>MEETING ROOM</b>
	<b>TUTORIAL BY ALEXANDRA MOUTINHO</b>
<b>20.00-23.00</b>	<b>CONFERENCE DINNER</b>

**FRIDAY, 7<sup>TH</sup> JUNE 2019**

<b>09.00-09.30</b>	<b>REGISTRATION</b>
<b>09.30-10.30</b>	<b>SESSION</b>
	<b>MEETING ROOM</b>
	<b>KEYNOTE ADDRESS BY JOEL COLLOC</b>
<b>10.30-11.00</b>	<b>COFFEE BREAK</b>
<b>11.00-12.30</b>	<b>SESSION</b>
	<b>MEETING ROOM</b>
	<b>MANPOWER MANAGEMENT</b>
<b>12.30-12.45</b>	<b>SESSION</b>
	<b>MEETING ROOM</b>
	<b>CLOSING SESSION</b>

**Wednesday, 5<sup>th</sup> June 2019**

**IN FRONT OF THE MEETING ROOM**

**Registration**

**08.30 - 15.30**

**09.00 – 09.15**

**MEETING ROOM**

**WELCOME**

**Opening ISC'2019 and Welcome**

## **Welcome Address**

João Calado, ISEL, Lisbon, Portugal  
**ISC'2019, General Program Chair**

Paulo J.S. Gonçalves, Instituto Politécnico de Castelo Branco and  
IDMEC, Instituto Superior Técnico, Lisbon, Portugal  
**ISC'2019, General Conference Chair**

**09.15 – 10.00**

**MEETING ROOM -09.15-10.00**

**KEYNOTE**

**KEYNOTE SPEECH**

**Chair: João Calado, ISEL, Lisbon, Portugal**



**KEY\_01**

**[Street Violence and Social Conflicts](#)**

Helder Coelho, Universidade de Lisboa, Lisboa, Portugal

# Wednesday, 5<sup>th</sup> June 2019

**10.00 - 10.30**  
**COFFEE BREAK**

**10.30 – 12.30**

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**MEETING ROOM -10.30-12.30** **MGMT**  
**MARKET ANALYSIS AND DECISION MANAGEMENT SIMULATION**  
Chair: Paulo J.S. Gonçalves, Instituto Superior Técnico, Lisbon,  
Portugal

**TOOLS\_01**

**Investigating the Factors which affect the Performance of the EM Algorithm  
in Latent Class Models**

Liberato Camilleri, Luke Spiteri and Maureen Camilleri ..... 5

**TOOLS\_03**

**Four and Eight Commodity Economic Equilibrium Problems with Extensive  
Substitution Possibilities**

William Conley..... 11

**ENG\_01**

**Definition of Strategies based on Simulation and Design of Experiments**

António Abreu, José Requeijo, J. M. F. Calado and Ana Dias..... 35

**COMP-SCI\_01/METH\_01**

**Situational Information System for Decision-Making Support regarding  
Industry-Natural Complexes**

Alexander Fridman and Andrey Oleynik ..... 41

**OR\_04**

**Reliability and Quality in Manufacturing**

William Conley..... 46

**12.30 - 14.00**  
**LUNCH BREAK**

## Wednesday, 5<sup>th</sup> July 2019

14.00 – 15.00

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**MEETING ROOM -14.00-15.00** **DATAMIN**  
**DATAMINING FORECASTING AND DATA CONSTRUCTS**  
 Chair: Joël Colloc, Université of Le Havre, Le Havre, France

**DATAMIN\_01**  
**A Smart Approach to Harvest Date Forecasting**  
 Beatriz Charneca, Vanda Santos, Ana Crespo, Henrique Vicente,  
 Humberto Chaves, Jorge Ribeiro, Victor Alves and José Neves ..... 19

**TRAIN\_01**  
**Operators' Structural Knowledge Evaluation as a Feedback in**  
**Computer-Based Training in Context of the Novel "Anna Karenina"**  
 Victor Dozortsev and Anastasia Mironova ..... 26

15.00 - 15.30  
**COFFEE BREAK**

15.30 – 17.00

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**MEETING ROOM - 15.30-17.00** **TRAF**  
**TRAFFIC SIMULATION AND URBAN MOBILITY**  
 Chair: Rosaldo J.F. Rossetti, University of Porto, Porto, Portugal

**TRAF\_01**  
**Acs Simulation and Mobile Phone Tracing to redraw Urban Bus Routes**  
 Giuseppe Iazeolla and Fabio Pompei ..... 117

**TRAF\_05**  
**Policy Appraisal using Iteration Games in Artificial Transportation Systems**  
Hajar Baghcheband, Zafeiris Kokkinogenis and Rosaldo J.F. Rossetti ..... 123

**TRAF\_06**  
**Using Simulation Games for Traffic Model Calibration**  
Gonçalo Leão, João Ferreira, Pedro Amaro and Rosaldo J.F. Rossetti ..... 131

**FREE EVENING**

Thursday, 6<sup>th</sup> June 2019

**IN FRONT OF THE MEETING ROOM**

**Registration**

**08.30 - 15.00**

**09.00 – 10.00**

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**MEETING ROOM - 09.00-10.00**

**KEYNOTE**

**KEYNOTE SPEECH**

**Chair:** Paulo J.S. Gonçalves, Instituto Superior Técnico, Lisbon, Portugal



**KEY\_02**

[Discrete-event Simulation Applications in Semiconductor Manufacturing](#)

Lars Mönch, Fernuniversität Hagen, Hagen, Germany

**10.00 - 10.30**

**COFFEE BREAK**

**10.30 – 12.30**

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**MEETING ROOM - 10.30-12.30**

**ROBOT**

**AUTOMATION/ROBOTICS AND DIGITAL TWINS**

**Chair:** Paulo J.S. Gonçalves, Instituto Superior Técnico, Lisbon, Portugal

**AUTO\_01**

**Intelligent Robotic Devices using Knowledge from the Cloud**

P.J.S. Gonçalves and F.M.S. Santos..... 77

Sessions - Thursday

**Thursday, 6<sup>th</sup> June 2019**

**OR\_05**  
**Influence of Task Allocation Patterns on Safety and Productivity in Human-Robot-Collaboration**  
Titanilla Komenda, Fabian Ranz and Wilfried Sihm..... 85

**AUG\_01**  
**Enhanced Interaction with Industrial Robots through Extended Reality Relying on Simulation-Based Digital Twins**  
Moritz Alfrink and Jürgen Roßmann ..... 90

**TRAF\_03**  
**A Case Study of a Digital Twin for Designing Intermodal Railways Operations for a Maritime Terminal**  
Emanuele Morra, Lorenzo Damiani, Roberto Revetria and Anastasiia Rozhok..... 98

**12.30 - 14.00**  
**LUNCH BREAK**

**14.00 – 15.00**

**MEETING ROOM - 14.00-15.00** **ENG**  
**ENGINEERING SIMULATION**  
**Chair: João Calado, ISEL, Lisbon, Portugal**

**ENG\_03**  
**Influence of Parametric Uncertainty of selected Classification Models of Sewage Quality Indicators on the Sludge Volume Index Forecast**  
 Bartosz Szelag, Jan Studziński and Izabela Rojek..... 105

**ENG\_04**  
**Automatically generated, Real-time, Logical Simulation of the Electrical System**  
Jerzy Kocerka and Michal Krześlak..... 111

**15.00 - 15.30**  
**COFFEE BREAK**



# Thursday, 6<sup>th</sup> June 2019

15.30 - 17.30

**MEETING ROOM – 15.30-17.30  
TUTORIAL**

**TUT**

**Chair: João Calado, ISEL, Lisbon, Portugal**



**TUT\_01**

**[Modeling and Simulation of Quadrotor Drones](#)**

Alexandra Moutinho, IDMEC, Instituto Superior Técnico, Universidade de Lisboa, Lisboa, Portugal

20.00 – 23.00

**CONFERENCE DINNER – 20.00-23.00**



The conference dinner will be held on Thursday the 6th of June at 8.00 p.m. at


**[Restaurante Chimarrão - Parque das Nações](#)**

**Alameda dos Oceanos**

**P 2.11 R/C, Fracção A, Edifício Lisboa**

**1900-231 Lisboa, Portugal**

 Email: [expo@chimarrao.pt](mailto:expo@chimarrao.pt)

 Tel: +351 21 002 6600

Friday, 7<sup>th</sup> June 2019

IN FRONT OF THE MEETING ROOM

Registration

09.00 - 09.30

09.30 – 10.30

MEETING ROOM - 09.30-10.30 **KEY**

KEYNOTE SPEECH

Chair: Paulo J.S. Gonçalves, Instituto Superior Técnico, Lisbon, Portugal



KEY\_03

[The Evolution of Artificial Intelligence towards autonomous systems with personality simulation](#)

Joël Colloc, Université of Le Havre, Le Havre, France

10.30 - 11.00

COFFEE BREAK

11.00 - 12.30

MEETING ROOM – 11.00-12.30 **MGMT**

MANPOWER MANAGEMENT

Chair: João Calado, ISEL, Lisbon, Portugal

OR\_01

**Manpower Planning using Simulation and Heuristic Optimization**

Oussama Mazari-Abdessameud, Johan Van Kerckhoven, Filip Van Utterbeeck and Marie-Anne Guerry ..... **53**

Friday, 7<sup>th</sup> June 2019

**TOOLS\_04/0R**

**Modelling Fire Fighters Actions in a Forest Fire Simulation Algorithm**

Yves Dumond ..... 59

**OR\_02**

**Flexible and scalable Field Service with Condition Base Maintenance  
Models for simulating Large Scale Scenarios**

Gabriel G. Castañé, Helmut Simonis, Kenneth N. Brown, Cemalettin Ozturk,  
Yiqing Lin and Mark Antunes ..... 67

**12.30 - 12.45**

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**MEETING ROOM - 12.30-12.45**

**BEST PAPER**

**CLOSING SESSION AND BEST PAPER AWARD**

**Chairs:** Paulo J.S. Gonçalves and Philippe Geril, EUROSIS-ETI, Ostend,  
Belgium

Sessions - Friday

## ISC'2020

**SEE YOU ALL  
At ISC'2020  
June 8-10, 2020,  
UCD, Dublin, Ireland**  
<http://www.ucd.ie/>



**Track proposals and tutorial proposals can be sent in  
by October 15<sup>th</sup>, 2019 to [philippe.geril@eurosis.org](mailto:philippe.geril@eurosis.org)**

**ISC'2021, June 2-4, 2021, [University of Malta](#), Valletta, Malta**

**If you are interested in hosting an ISC conference from 2022 onward, just  
contact EUROSIS.**

# Conference Site Maps

MAP OF THE EASTERN PART OF LISBON IN RELATION TO ISEL



Conference Site Maps

# Conference Site Maps

## Lisbon Metro Map



# NOTES

# ISC'2019 at Conference Registration Form

Please legibly print or type and fill out completely. (Check appropriate boxes where necessary)

FIRST NAME	LAST NAME	M.I.
COMPANY OR AFFILIATION		
Mailing address (tick one): <input type="checkbox"/> HOME <input type="checkbox"/> BUSINESS		
STREET		
CITY		
ZIPCODE	COUNTRY	
TELEPHONE	FAX	
E-MAIL		
DATE	SIGNATURE	
1. <input type="checkbox"/> <b>EUROSIS member € 565 Member Number:</b> _____		€ _____
2. <input type="checkbox"/> <b>Members of Sponsor or Affiliate Society € 565</b>		€ _____
3. <input type="checkbox"/> <b>Non-Member Participant € 610</b>		€ _____
4. <input type="checkbox"/> <b>Students, <u>who are not authors</u> but who wish to attend the conference, or <b>ONE DAY PARTICIPANTS</b> pay: € 450</b>		€ _____
(Above registration fees include, one copy of the PROCEEDINGS, all midday meals, cocktail, refreshments, coffees and social program,) One Day Participants and Non-Author Students cannot participate in the conference dinner.		
5. <input type="checkbox"/> <b>Conference Dinner Ticket for Companion € 45</b> <input type="checkbox"/> <b>Lunch Ticket for Companion € 15/day</b>		€ _____
6. <input type="checkbox"/> <b>Extra Conference Proceedings € 35 Cash and Carry</b>		€ _____
VAT Number if applicable: _____		
<b>TOTAL AMOUNT DUE</b>		€ _____
		€ _____
<b>TOTAL AMOUNT REMITTED</b>		€ _____

Pay by **CREDIT CARD** and fill in the information below:

Charge my (tick one):  Visa  Euro/Mastercard  American Express

CARD NO: \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_ EXP.DATE: \_\_\_\_ / \_\_\_\_

Authorizing Signature:

Print Signature in CAPITALS



# eurosis

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 EUROSIS is to set up 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.

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

**Philippe Geril**  
**EUROSIS-ETI**  
**European Simulation Office**  
**Greenbridge Science Park**  
**Ghent University – Campus Ostend**  
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