FINAL PROGRAM

23-25 October 2013

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General Information

1. Conference Location

The ESM’2013 Conference is being held at Lancaster University.

In the Conference Centre
Bowland Avenue
Lancaster University
Lancaster LA1 4YT
Tel: +44.1524 594194/4189
Email: conferenceoffice@lancaster.ac.uk

The registration desk will be placed in the foyer from Wednesday morning October the 23rd onwards, where registration will start at 08.00 and will end at 5.00 p.m. On Thursday October 24th registration will be from 8.30 a.m. - 5.00 p.m. with Friday registration only from 8.30 a.m.- 9.00. 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 Lancaster:

By Plane

When arriving by plane in the UK you are mostly destined to arrive in London either at Heathrow, Stansted, Gatwick or Luton Airport. From these airports you need to make your way by train or tube to Euston Station from where you can take a direct train to Lancaster. (journey time 2 1/2 to 3 hours - depending on the time of day)

We recommend that, whenever possible, overseas visitors reach Lancaster via Manchester International Airport. From the airport, there are a number of travel options:

a) There is a direct rail link from the Manchester International Airport (terminal 2) to Lancaster, (total journey time is between 1 1/2 and 2 1/2 hours, depending on the time of day). This is our recommended option.

b) There is a shuttle bus from the Main Bus Station near the International Arrivals to either Manchester Piccadilly rail station or (better) Manchester Victoria rail station (total journey time is between 1 1/4 and 2 3/4 hours, depending on the time of day).
c) By car: take M56 motorway from junction 5 and then join the M6 at junction 20a (North) and proceed as in by car below. See the map of the terminals here at Manchester International Airport

By Train
When taking the train to the United Kingdom, you will be using the EUROSTAR service arriving at St.Pancras station. After clearing customs and passport control you leave the station and walk to Euston Station from where you can take a direct train to Lancaster. (journey time 2 to 2 1/2 hours - depending on the time of day) If you arrive from Birmingham Airport then take a train from the airport to Birmingham New Street Station. (See Journeyplanner to work out your itinerary). Book train tickets on the National Rail website. Taxis are usually available from outside Lancaster station; otherwise, there is a bus stop a few minutes walk away, next to Lancaster market on Common Garden Street.

By Tram and Bus
Lancaster city is on the national coach network; National Express coaches call at the University. To plan your coach journey, consult the National Express Coach Timetable. Local buses (numbers 2, 2A, X2, 3, 3A, X3) from Lancaster bus station run approximately every 20 minutes to the University. - From rail station to university is X1. All buses are served by a company called StageCoach. Hence, their timetable can be found here. There is also a direct service - UniSprint - which again runs at 20 minute intervals. See Lancaster Bus station

By Car
From the north or south: leave the M6 motorway at junction 33 and take the A6 north towards Lancaster and continue for 1 3/4 miles - passing through the village of Galgate. After leaving Galgate, turn right at the second set of traffic lights into the University main drive. (Do not turn right at the first set of traffic lights - signposted to Alexandra Park).

At the roundabout at the top of the drive, turn right for the Management School. The Management School is the large glass-fronted building, located just past Gillow Avenue (the third turning on the left after the roundabout).

Visitors to Lancaster University Management School should park in Gillow Avenue (third left after the roundabout at the top of the University Drive). You will need either a valid one-day visitor scratch card or a pay and display sticker available from the machine in Gillow Avenue.
General Information

Ticket machines dispense tickets for 2 hours at £2. From January 2011 chip and pin card payment facilities are available at each machine. All-day visitor scratch cards are available from the LUMS Reception or Security Reception on Bowland Avenue priced at £5 each.

2. 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.

3. Tickets

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

<table>
<thead>
<tr>
<th>Extra conference dinner</th>
<th>€ 60</th>
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<tbody>
<tr>
<td>Extra lunch ticket</td>
<td>€ 25</td>
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4. Registration

The ESM'2013 Registration Desk will be open for information and registration:

- Wednesday, October 23....... 8.00 a.m. to 5.00 p. m.
- Thursday, October 24.......... 8.30 a.m. to 5.00 p. m.
- Friday, October 25 ............. 8.30 a.m. to 9.00 a.m.

The location of the registration desk will be signposted.

5. 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'2013)

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

| ESM'2013 Proceedings CASH AND CARRY | € 50 |

6. Meeting Rooms

The ESM'2013 conference will be held in meeting room 2 (main room) and meeting room 4 (breakout room). They are designated A and B in this programme.
General Information

The way to the rooms will be signposted. WIFI-Internet and electrical connections are available in every room.

7. Need Help?
Please see the conference desk for your questions.

8. Social Events and Lunches
All registrants are invited to
All Coffee Breaks are served in the hallway in front of the meeting rooms.
The lunches are served in on the ground floor on the reception level.

The Conference Dinner
All participants are invited to the conference dinner on THURSDAY the 24th of October.
As we need to give an exact number of participants we would appreciate your confirmation at the desk before Wednesday evening.
The dinner will be held at:

![Conference Venue](image)

The Midland
Marine Road West
Morecambe
Lancashire, LA4 4BU
Tel: +44(0)1524 424000
email: themidland@englishlakes.co.uk

9. Room Legend
The parallel meeting rooms will be designated ROOM A (room 2) and B (room 4). Signposts will indicate the room number and programme above each door.

10. Best Paper Award
During the conference the papers, which were accepted as extended papers will be judged by the committee in order to choose the best paper of the ESM'2013 conference.
General Information

11. 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:**

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<tr>
<td>08.00-17.00</td>
<td>REGISTRATION</td>
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<td>09.00-09.15</td>
<td>WELCOME BY STEPHAN ONGGO – ESM’2013 CONFERENCE CHAIR - ROOM A</td>
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<td>KEYNOTE ADDRESS BY PROFESSOR MICHAEL PIDD, LANCASTER UNIVERSITY - ROOM A</td>
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Wednesday, 23rd October 2013

HALLWAY
Registration
08.00 - 17.00

ROOM A
09.00 – 09.15
Opening ESM’2013 and Welcome

Welcome Address

Stephan Onggo
Lancaster University
ESM’2013 General Conference Chair

ROOM A - 09.15-10.00
KEYNOTE SPEECH
Chair: Stephan Onggo, Lancaster University, United Kingdom

Rethinking the Place of System Dynamics and Discrete Event Simulation
Professor Michael Pidd, Department of Management Science, Lancaster University, Lancaster, United Kingdom
## Wednesday, 23rd October 2013

### 10.00 - 10.30
COFFEE BREAK

### 10.30 – 12.30

### ROOM A - 10.30-12.00

**TRAFFIC**

**VEHICLE ROUTING SIMULATION**

**Chair:** Rita Marques Brandão, University of the Azores, Portugal

**AI_02_LOGIS**
Production Simulation of Decentralized Autonomous FMS and AGV’s
Route Interference Avoidance using MIND
Hidehiko Yamamoto and Takayoshi Yamada .............................................. 273

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An Agent-Based Vehicle Routing Simulation Tool for Road Networks with Time Variant Data
Bhakti S.S. Onggo, Michael Bažant and Jiří Popelka .................................. 284

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Simulation of Localization Rolling Stock within The Railway Network Model utilizing Agent Based Simulation
Jan Fikejz and Emil Rezanina ................................................................ 290

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**ENGIN**

**DATA DRIVEN SIMULATION IN ENGINEERING**

**Chair:** Paulo Sampaio, University of Madeira, Portugal

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Joaquim Tinoco, António Gomes Correia and Paulo Cortez .......................... 183

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Translation of Conditional Robot Action Planning to Linear Programming
Adam Galuszka ................................................................................................................. 201

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Chair: Jose Evora, University Institute of Intelligent Systems, Spain

INV_03
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Valerian Croitorescu ......................................................................................................... 5

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Chair: Chrissanthi Angeli, Technological Institute of Piraeus, Greece

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Visual Network Description: A Customizable GUI for the Creation of Software Defined Network Simulations
Ramon Fontes and Paulo N.M. Sampaio ............................................................................ 149

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Svetla Radeva, Ekaterina Otsetova-Dudin and Dimitar Radev ........................................ 154

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Chair: Henrikas Pranevicius, Kaunas Univ. of Technology, Lithuania

TRANS_08_HOS
Improving Material Logistics in a Hospital Environment using Discrete Event Simulation
Toni Ruohonen and Pentti Nakari

AGENT_05
A Multi-Agent System for Intelligent Scheduling of Non-Emergency Medical Patients' Transportation
Anton Ivaschenko, Anton Dmitriev and Alina Vaisblat

WEB_01
System Dynamics in Healthcare: A Web Based Approach
Konstantinos Domdouzis, Peter Lacey, Darren Lodge and Simon J.E.Taylor

METH_02
A Metamodeling Approach to the Behavior of the Variance in Nonstationary Simulations
Rita Marques Brandão and Acacio M. O. Porta Nova

TRANS_07_ENV
Reducing Emissions of Taxiing at Airports
Mark B. Duinkerken, Ted Selderbeek and Gabriel Lodewijks

ROOM B - 15.30-17.30
ENGINEERING SIMULATION
Chair: Adam Galuszka, Silesian Technical University, Poland

TOOL_06
Tafat: A Framework for Developing Simulators based on Model Driven Engineering
Jose Evora, Jose Juan Hernandez and Mario Hernandez

METH_07
Vibration Suppression using Piezoelectric Elements: Model Development for Control Applications
Roxana Mutu, Marius Valentin Bataus and Valerian Croitorescu
Wednesday, 23rd October 2013

EDU_05
3D Explicit Simulation of Impact Response of the Protective Shell during Flywheel Failure
Jiang Lei, Zhang Xiao-Zhang, Wang Liming, Wu Lei, Su Shenjian, Duan Changcheng and Wang Xia ................................................................. 217

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Constantin Calinoiu, Daniela Vasiliu, Puhalschi Radu, Nicolae Vasiliu and Irimia Petru Cristinel ................................................................. 220

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HALLWAY
Registration
08.30 - 17.00

09.00 – 10.00

ROOM A- 09.00-10.00
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Chair: Roger J. Brooks, Lancaster University, United Kingdom

INV_02
Understanding the big picture: how modeling and simulation BAE Systems an edge
Suzanne Harrison, Head of Service Delivery, CORDA, BAE Systems, United Kingdom

ROOM B - 09.00-10.00
GRID SIMULATION
Chair: Antonin Kavicka, University of Pardubice, Czech Republic

AGENT_02
Asynchronous approach to simulations in Smart Grid
Jose Evora, Jose Juan Hernandez and Mario Hernandez............................................. 137

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Eugeniusz M. Sroczan and Andrzej Urbaniak .......................................................... 142

10.00 - 10.30
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Thursday, 24th October 2013

10.30 - 12.30

ROOM A - 10.30-12.30

POPULATION DYNAMICS SIMULATION
Chair: Konstantinos Domdouzis, Whole System Partnership, UK

METH_05
Hybrid Continuous Time Monte Carlo Simulation of Disperse Systems
Béla G. Lakatos, Ágnes Bárányi and Sándor Németh

AGENT_03_ENV
Automatic Generation of Global Agent Based Model of Migratory Waterfowl for Epidemiological Analysis of Avian Influenza and other Zoonoic Diseases
Dhananjai M. Rao and Alexander Chernyakhovsky

BIO_01
Simulation Driven Detection of the Increased Risk Periods during Fentanyl Analgesia
Henrikas Pranevicius, Vytautas Pilkauskas, Mindaugas Pranevicius, Isaac P. Lowenwirt and Osvaldas Pranevicius

BIO_02
Fentanyl Delivery Optimization using Markov Chain Multi Compartmental Model
Henrikas Pranevicius, Mindaugas Pranevicius, Osvaldas Pranevicius and Mindaugas Snipas

ROOM B - 10.30-12.00

TRAINING SIMULATION
Chair: John Geraghty, Dublin City University, Ireland

AI_01
Simulated Learner Models of Human Skills in Programming
Eleandro Maschio and Alexandre Direne

WEB_02
Web-Based Simulation in Teaching
Jan Hrídel and Štepán Karták
Thursday, 24th October 2013

EDU_01
“Virtual Surgeon” Training Suite for Laparoscopy, Endovascular and Open Surgery Simulation
Anton Ivaschenko, Anton Dmitriev, Alexey Cherepanov, Alina Vaisblat and Aleksander Kolsanov .............................................................. 114

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14.00 - 15.00

ROOM A - 14.00-15.00
INVITED PRESENTATION
Chair: Stephan Onggo, Lancaster University, United Kingdom

INV_01
Simple Models for a Complex World
Stewart Robinson, School of Business and Economics, Loughborough University
United Kingdom

ROOM B - 14.00-15.00
PAR
DISTRIBUTED SIMULATION
Chair: Andrzej Urbaniak, Poznan University of Technology, Poland

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Distributed Agent Based Simulation Framework
Carlos Bragança de Oliveira and António Carvalho Brito ......................... 121

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Jiří Pénzeš and Antonín Kavicka ............................................................ 128
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15.00 - 15.30
COFFEE BREAK

15.30 – 18.00

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FLUID FLOW SIMULATION
Chair: Jan Studzinski, Systems Research Institute, Poland

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C. Angeli and A. Chatzinikolaou ................................................................. 229

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Lingling Hu, Zhiheng Qiu, Xiuzhen Jiang and Jiangcheng Gong ..................... 234

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Alis Musa, Ilie Prisecaru and Gheorghe (Nicolici) Claudia .............................. 238

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Development of a Finite Element Model for PHWR Pressure Tube Sagging Simulation
Stefan Nicolici, Daniel Dupleac and Ilie Prisecaru ........................................ 243

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Mait Harf and Gunnar Grossschmidt .......................................................... 247

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Chair: Valerian Croitorescu, University POLITEHNICA, Romania

EMER_02_TRANS
Modelling, Simulation and Information Systems as a Tool to Support Decision Making Process in Crisis Management
Jozef Ristvej, Adam Zagorecki, Katarína Hollá, Ladislav Šimák and Michal Titko ................................................................. 71
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METH_01
A Pilot Survey on Data Identification and Collection in Simulation Projects
Bhakti S. S. Onggo, James Hill and Roger J. Brooks ........................................ 77

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A Prototype Integration of MANPY with CMSD
Panos Barlas, Georgios Dagkakis and Cathal Heavey ....................................... 85

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Shortest Route Problem with Soft Time Windows
Kris Braekers and Gerrit K. Janssens ................................................................. 279

CONFERENCE DINNER – 19.30 -22.30

All participants are invited to the conference dinner which will be held from 19.30 to 22.30 at The Midland

Marine Road West
Morecambe
Lancashire, LA4 4BU
Tel: +44(0)1524 424000
email: themidland@englishlakes.co.uk

The participants be taken by bus from Lancaster University Conference Centre to the dinner location
Bus: departure 18.30 p.m.
Bus departure after dinner at 22.30 p.m.
Friday, 25th October 2013

HALLWAY
Registration
08.30 - 09.00

09.00 – 10.15

ROOM A - 09.00-10.15
TUTORIAL
Chair: Stephan Onggo, Lancaster University, United Kingdom

Decision Support using Business Process Model and Notation (BPMN) and
Agent-Based Simulation
Peer Olaf Siebers, Nottingham University, Nottingham, United Kingdom

ROOM B - 09.00-10.00
ECONOMICS AND PRODUCTION SIMULATION I
Chair: Gerrit Janssens, Hasselt University, Belgium

AI_04
A Probabilistic Analysis of Transactions Success Ratio in Real-Time
Databases
Mourad Kaddes, Laurent Amanton, Alexandre Berred, Bruno Sadeg,
Majed Abdouli and Rafik Bouaziz................................................................. 46

TRANS_01
Employment Effects of Ports and Cost Benefit Analyses
Torsten Marner and Matthias Klumpp...................................................... 54

10.00 - 10.30
COFFEE BREAK

10.30 - 12.30

ROOM A - 10.30-12.30
WATER DISTRIBUTION SYSTEMS
Chair: Peer Olaf Siebers, Nottingham University, United Kingdom
Friday, 25th October 2013

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Multi-Agent Simulation to support Water Distribution Network Partitioning
Saeed Hajebi, Stephen Barrett, Aidan Clarke and Siobhán Clarke ......................... 163

ENV_01
Energy cost reducing in a water pumping station - modeling and simulation
Rafal Brodziak, Tomasz Kaźmierski and Andrzej Urbaniak........................................ 169

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Monitoring System, Hydraulic Model and Neuronal Networks
Jan Studzinski and Izabela Rojek................................................................. 172

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by Heating and Cooling Systems in Buildings
Mariusz Nowak and Andrzej Urbaniak....................................................................... 176

ROOM B - 10.30-12.30
ECONOMICS AND PRODUCTION SIMULATION II
Chair: Matthias Klumpp, FOM Essen, Germany

METH_08
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Ruby Wai Chung Hughes, Rab Scott and Keith Ridgway........................................ 62

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Integration of Humans into a Multi-Agent System
Fredrik Danielsson, Bo Svensson and Jun He ...................................................... 257

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Product Line Development of Models with MATLAB/Simulink
Yves Duhr, Thomas Ringler and Stefan Kowalewski............................................. 260

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Hybrid Kanban Allocation Policy in Pull Control of Multiproduct Manufacturing Systems
Oladipupo Olaitan, Anna Rotondo, Paul Young and John Geraghty ......................... 265
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ROOM A - 12.30 - 12.45
CLOSING SESSION AND BEST PAPER AWARD
Chair: Stephan Onggo, Lancaster University, United Kingdom

EUROISIS
Philippe Geril, EUROISIS, Ostend, Belgium
SEE YOU ALL

OCTOBER 2014, Porto, Portugal
FOR ESM’2014

Track proposals and tutorial proposals can be sent in by January 30th, 2014

Proposals for future event locations can be emailed to philippe.geril@eurosis.org

Information on all 2014-2015 EUROSIS Events can be found on http://www.eurosis.org
Conference Site Maps

LANCASTER UNIVERSITY LOCATION MAP
Conference Site Maps

LANCASTER CITY CENTRE
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.

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

**Philippe Geril**  
**EUROSIS-ETI**  
Greenbridge Science Park  
Ghent University – Ostend Campus  
Wetenschapspark 1, Plassendale 1  
B- 8400 Ostend, Belgium  
☎ Tel: +32.59.255.330  
✉ Fax: +32.59.255.339  
✉ Email: Philippe.Geril@eurosis.org

Please send me info on EUROSIS:
Name: ....................................................................................................................
Address: ..................................................................................................................
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Telephone..................................................................................................................
Fax: ........................................................................................................................
Email: ....................................................................................................................
# ESM’2013 Registration Form

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

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**COMPANY OR AFFILIATION**

Mailing address (tick one): [ ] HOME [ ] BUSINESS

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1. [ ] EUROSIS member € 545 Member Number: ________________________________

2. [ ] Members of Sponsor or Affiliate Society € 545

3. [ ] Non-Member Participant € 555

4. [ ] Students, who are not authors but who wish to attend the conference, or ONE DAY PARTICIPANTS pay: € 435

(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. [ ] Conference Tutorial BPMN € 100

6. [ ] Conference Dinner Ticket for Companion € 60 [ ] Lunch Ticket for Companion € 25/day

7. [ ] Extra Conference Proceedings € 50 Cash and Carry

VAT Number if applicable: ________________________________

**TOTAL AMOUNT DUE**

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ADD BANK CHARGE of € 15 in case you pay by BANK or CHEQUE.

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[2] 2) Or pay by CHEQUE and send it to Philippe Geril, EUROSIS-ETI, European Simulation Office, Greenbridge Science Park, Ghent University – Ostend Campus, Wetenschapspark 1, Plassendale 1, B-8400 Ostend, Belgium.

[3] 3) Or pay by CREDIT CARD and fill in the information below:

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

CARD NO: __ __ __ __ : __ __ __ : __ __ __ __ : __ __ __ __ EXP.DATE: __ __ / __ __

Authorizing Signature:

Print Signature in CAPITALS