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Lisbon  
Portugal

**SIM2013**  
26 to 29 Jun

## Sustainable Intelligent Manufacturing International Conference

### Invited Speakers

**Branko Kolarevic**  
University of Calgary, Canada

**Francesco Jovane**  
Politecnico di Milano, Italy

**Gabriela Celani**  
UNICAMP, Brazil

**Giuseppe D'Angelo**  
FIAT Research Center, Italy

**Joost Dufflou**  
University of Leuven, Belgium

**Klaus Sedlbauer**  
Fraunhofer-Institut für Bauphysik IBP, Germany

**Lawrence Sass**  
MIT, USA

**Marco Santochi**  
University of Pisa, Italy

**Mario Buono**  
Seconda Università degli Studi di Napoli, Italy

**Paulo Jorge Ferreira**  
University of Texas at Austin, USA

**Rivka Oxman**  
Technion Israel Institute of Technology, Israel

**Robert Miles Kemp**  
Variate Labs, USA



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<http://www.fa.utl.pt/>

# Contents

|    |                          |
|----|--------------------------|
| 5  | Welcome                  |
| 6  | Acknowledgements         |
| 7  | Organizing Committee     |
| 8  | Scientific Committee     |
| 10 | Invited Speakers         |
| 22 | Programe                 |
| 22 | June 26                  |
| 28 | June 27                  |
| 32 | June 28                  |
| 38 | June 29                  |
| 42 | Conference Areas         |
| 44 | General Information      |
|    | Conference BUS timetable |
|    | Meeting Point            |

# Welcome

Dear Colleagues and Friends,

On behalf of the organising committee, it is our pleasure to welcome you to the International Conference on Sustainable Intelligent Manufacturing (SIM2013) conjointly organized by the Centre for Rapid and Sustainable Product Development, Polytechnic Institute of Leiria, and the Faculty of Architecture, Technical University of Lisbon, taking place at Lisbon. The Conference aims to provide a major international forum for academics, researchers and industrial partners to exchange ideas in the field of sustainable intelligent manufacturing and related topics. The conference expects to foster networking and collaboration among participants to advance the knowledge and identify major trends in the field.

The rise of manufacturing intelligence is fuelling innovation in processes and products considering a low environmental impact over the product's lifecycle. Sustainable intelligent manufacturing is regarded as a manufacturing paradigm for the 21st century, towards the next generation of manufacturing and processing technologies. On one hand, the manufacturing industry is at a turning point of its evolution and new business opportunities are emerging. On the other hand, sustainability has become a key concern for government policies, businesses and general public. Model cities are moving forward towards novel ecosystems, combining environmental, social and economic issues in more inclusive and integrated frameworks.

DMS: 38° 42' 43" N 09° 11' 44" W



view of the Faculty of Architecture

# Acknowledgements

The Organizing Committee wishes to thank the following organizations and individuals, who contributed in preparing the International Conference on Sustainable Intelligent Manufacturing (SIM2013).

The Polytechnic Institute of Leiria



The Centre for Rapid and Sustainable Product Development (CDRSP)



The Faculty of Architecture  
Technical University of Lisbon



Research Centre for Architecture,  
Urban Planning and Design (CIAUD)



Portuguese Foundation for Science  
and Technology



# Organizing Committee

## Conference Chairs:

**Helena Bártolo**

Centre for Rapid and Sustainable Product Development  
Polytecnic Institute of Leiria

**José Pinto Duarte**

Faculty of Architecture  
Technical University of Lisbon

**Paulo Bártolo**

Centre for Rapid and Sustainable Product Development  
Polytecnic Institute of Leiria

**Filipa Roseta**

Faculty of Architecture  
Technical University of Lisbon

# Scientific Committee

**Alain Bernard**  
École Centrale de Nantes, France

**Andres Harris**  
Architectural Association School of  
Architecture, UK

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University of Trento, Italy

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University of Reading, UK

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RWTH Aachen University, Germany

**Fernando Moreira da Silva**  
Universidade Técnica de Lisboa, Portugal

**Gerhard Schmitt**  
ETH Zürich, Switzerland

**Gideon Levy**  
Centre for Rapid and Sustainable Product  
Development (IPL), Portugal

**Hans Haenlein**  
Hans Haenlein Architects, UK

**Hazim B. Awbi**  
University of Reading, UK

**Humberto Varum**  
Universidade de Aveiro, Portugal

**Ian Gibson**  
National University of Singapore, Singapore  
Centre for Rapid and Sustainable Product  
Development (IPL), Portugal

**Jay Yang**  
Queensland University of Technology,  
Australia

**Jan Halatasch**  
ETH Zürich, Switzerland

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Purdue University, USA

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Universidade Técnica de Lisboa, Portugal

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Pontifícia Universidade Católica do Rio de  
Janeiro, Brasil

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Escola Superior de Artes e Design Matosinhos,  
Portugal

**Kevin Lyons**  
The State University of New Jersey, USA

**Konrad Wegener**  
ETH Zürich, Switzerland

**Kunze Antje**  
ETH Zürich, Switzerland

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Université du Québec à Trois-Rivières, Canada

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**Mohamed Hussein**  
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USA

**Mohsen Aboulnaga**  
University of Dubai, United Arab Emirates

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Variate Labs, USA

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MIT Media Laboratory, USA

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University of Cambridge, UK

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King Fahd University of Petroleum & Minerals,  
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Universidade de Aveiro, Portugal

**Wilfried Sihn**  
Vienna University of Technology, Austria

**Winifred Ijomah**  
University of Strathclyde, UK

## Invited Speakers



Branko Kolarevic  
University of Calgary, Canada

Branko Kolarevic is Associate Dean (Academic-Architecture) and Professor at the University of Calgary Faculty of Environmental Design, where he also holds the Chair in Integrated Design and is a co-founder of the Laboratory for Integrative Design (LID). Prior to his appointment at the University of Calgary, he was the Irving Distinguished Visiting Professor at Ball State University in Indiana. He has taught architecture at several universities in North America, most recently at the University of Pennsylvania, and in Asia, in Hong Kong. He has lectured worldwide on the use of digital technologies in design and production and has authored, edited or co-edited several books, including "Manufacturing Material Effects: Rethinking Design and Making in Architecture" (with Kevin Klinger), "Performative Architecture: Beyond Instrumentality" (with Ali Malkawi) and "Architecture in the Digital Age: Design and Manufacturing." He is the past president of the Association for Computer Aided Design in Architecture (ACADIA) and is the recipient of the ACADIA 2007 Award for Innovative Research. He holds doctoral and master's degrees in design from Harvard University and a diploma engineer in architecture degree from the University of Belgrade in the former Yugoslavia.



Francesco Jovane  
Politecnico di Milano, Italy

Author of more than 200 papers, in the field of manufacturing and innovation. Developed and presented, at the CIRP General Assembly in 2003, the "Manufuture philosophy", that triggered the European Technological Platform Manufuture, followed by 27 National Platforms, and, later, the European "Factories of the Future" PPP Initiative. Worked for the Italian Ministry of Research on the definition of several National Research Programmes, in the domain of Manufacturing. Promoter and director of the first and largest Italian National Programme on FMS, by CNR. Italian representative within several European Framework Programmes. Eureka High Level Representative for Italy. Co-founder of Eureka Famos and Factory Umbrella Projects, promoter of "Manufuture Industry" Eureka Cluster. Vice-president for Research of the European and Italian Manufuture Technological Platforms. Honorary member of the European Factories of the Future Research Association (EFFRA) Board of Directors. Honorary Fellow and President (2002-2003) of CIRP, The International Academy for Production Engineering. Recipient of SME Sargent Progress Award, for his contribution to Research and Innovation in Manufacturing.





Gabriela Celani  
UNICAMP, Brazil

Gabriela Celani holds a BA (1989) and MSc (2007) in Architecture and Urban Design from the University of São Paulo (USP), and a PhD (2002) in Design and Computation from the Massachusetts Institute of Technology (MIT). She is presently an Associate Professor at the School of Civil Engineering, Architecture and Urban Design at the University of Campinas (Unicamp), Brazil. She is the founder of LAPAC, Unicamp's Laboratory of Automation and Prototyping for Architecture and Construction. Her work focuses on generative design, rapid prototyping, digital fabrication, 3D digitation and automation of the architectural design process. She is a member of the executive board of SIGRADI, the Ibero-american Society of Digital Graphics, and belongs to the scientific committees of several CAAD conferences, such as ECAADE, CAADRIA and DCC, and journals, such as IJAC and Automation in Construction. Gabriela Celani is also an adviser for the Dean of Undergraduate Programs at Unicamp.



Giuseppe D'Angelo  
FIAT Research Center, Italy

Dr. Ing. Giuseppe D'Angelo, received the Engineer degree in Electronic from University of Napoli in 1989. He joined the FIAT Research Centre in 1990 where he is currently employed. In 1990, he attended the post-graduate courses on Optical Physics at National Institute of Optics (INO) in Florence and on Laser Propagation at Research Institute on Electromagnetic Waves (IROE) in Florence. Since 1992 to 1999, he conducted research on laser technologies and industrial application. Author of 5 patents. Since 2000 to 2010 he led the department – Laser Process Monitoring System (SMPL). He developed advanced signal analysis methodologies based on Time-Frequency Distribution (TFD), Empirical Mode Decomposition (EMD), Orthogonal Hilbert-Huang Transform (OHHT). Author of 6 patents. Furthermore, he developed advanced image analysis methodologies based on Phase Congruency theory and Monogenic Filters. Author of 4 patents. He is currently leading the department of manufacturing processes. His research interests are focused on the use of ICT for Environmental Sustainability. He is author of more than 30 papers presented at international conferences or published in international journals.



Joost Duflou  
University of Leuven, Belgium

Joost R. Duflou holds master degrees in Architectural and Electro-mechanical Engineering and a PhD in Engineering from the KU Leuven, Belgium. After a number of years of industrial experience in different international companies, he has been active as a faculty member at the Mechanical Engineering Department of the KU Leuven since 1997. He became a tenured Full Professor in 2012. His principal research activities are situated in the field of design support methods and methodologies, with special attention for Systematic Innovation, Ecodesign and Life Cycle Engineering, and Sustainable Manufacturing. As chairholder of the LVD Chair on Sheet Metal Processing, he also leads a research group focussing on sheet metal oriented manufacturing processes. He is a member of CIRP and has published over 200 international publications. As chair and board member of several spin-off companies and professional associations he contributes to research valorisation and dissemination. More detailed information can be obtained via <http://www.kuleuven.be/wieiswie/nl/person/00016263>.



Klaus Sedlbauer  
Fraunhofer-Instituts für Bauphysik IBP, Germany

University Professor Dr.-Ing. Dipl.-Phys. Klaus Sedlbauer, born in 1965. University studies of physics at Ludwig Maximilian Universität (LMU) in Munich. Since 1992 researcher at Fraunhofer Institute for Building Physics IBP in Stuttgart and Holzkirchen. Doctorate in 2001. From 2001 to 2003 Deputy Director of the Institute. Summer semester in 2003 Professor at Fachhochschule Rosenheim (Politechnic). Since November 2003 Director of the Fraunhofer Institute for Building Physics and Professor at the Department of Building Physics of Faculty 2 „Civil and Environmental Engineering“ as well as co-opted member of Faculty 1 „Architecture and Urban Planning“ of Universität Stuttgart. Constant member of the Indoor Air Hygiene Commission (IRK) of the Federal Environment Agency since 2003, member of the Scientific Advisory Council of the Bundesverbandes für Schimmelpilzsanierung (BSS) (Federal Association of Mould Remediation) since 2004. In June 2004, he was awarded the WTA prize by the International Association for Science and Technology of Building Maintenance and Monuments Preservation (WTA). In November 2005, he was awarded the prize of honour of the Chamber of Commerce of Münster in recognition of his engagement in the cooperation of science and trades. Since 2007 he has been a member of the Senate of Fraunhofer-Gesellschaft. Co-founder of the German Sustainable Building Council (DGNB). Nomination as spokesman of the Fraunhofer Building Innovation Alliance in 2008.





Lawrence Sass  
MIT, USA

Larry is an architectural designer and researcher exploring digital design and fabrication across scales. As an associate professor in the Department of Architecture at MIT, Larry has taught courses specifically in digital fabrication and design computing since 2002. He earned his PhD '00 and SMArchS '94 at MIT, and has a BArch from Pratt Institute in NYC. Larry has published widely, and has exhibited his work at the Modern Museum of Art in New York City.

Larry's research builds on his belief that hand crafted, hand operated construction will soon be a thing of the past, and that in the future, buildings will be printed with machines run by computers. He proposes that the practice of architecture must incorporate new and emerging means of machine operation within fields of design and construction, and that these changes require the development of a new knowledge base for design where designers will plan a larger role in the delivery process. The challenge for architecture schools and the profession will be the development of new research and teaching agendas related to creative digital design and fabrication across scales – from furniture to skyscrapers. Larry will share findings from current research projects, including large-scale prototyping of design artifacts from CAD data, and digitally fabricated houses.



Marco Santochi  
University of Pisa, Italy

After a career at the University of Pisa, Marco Santochi is full professor of Manufacturing processes at the Faculty of Engineering of the University of Pisa since November 1st, 1990. Head of the department of Production Engineering of the University of Pisa since 1997 to 1998, he has been head of the department of Mechanical, Nuclear and Production Engineering since 2006 to 2010. His research activity covers various areas like sensors for cutting process monitoring, adaptive controls for machine tools, Computer Aided Process and assembly/disassembly Planning, robotized precision assembly, disassembly of end of life consumer products, microgeometry and integrity of machined surfaces, microassembly. He is author of more than 100 papers presented at international conferences or published in international journals and Fellow of the International society for nanomanufacturing. Marco Santochi has been member of scientific committees of several conferences and currently member of the editorial board of the CIRP International journal for manufacturing science and production. He is Fellow of CIRP (International Academy for production engineering, where he had the role of Technical secretary for ten years and was chairman of the STC Assembly for three years. At present Marco Santochi is the president of CIRP.



**Mario Buono**  
Seconda Università degli Studi di Napoli, Italy

Suitable Contest Professor held at the University of Sassari in S.S.D. ICAR 13\_ INDUSTRIAL DESIGN BUONO Mario\_ Coordinator of Design and Innovation International Phd Mario Buono became associate Professor of Industrial Design at the Faculty of Architecture at the Seconda Università degli Studi di Napoli in November 2001. He has been vice president of the Department IDEAS – (Industrial Design Environment and History) since 2009 he is coordinator of International phd in Design and Innovation, and since 2005 he is member of the Scientific Board of the Interdisciplinary Center of Services – Ri.A.S. He has held various positions such as Industrial Design Researcher, Phd doctorate, CNR fellowship researcher, architect, and scientific supervisor of several projects of applied research financed by PON and MIUR on product and design innovation aimed towards territory valorization. As Scientific supervisor he has worked on several internationalization research projects - Euromedsys e Euromedsys II; Pablo Picasso and the design of ceramics in the artistic production of the Mediterranean, financed by MIUR, in the framework of Italy – Spain Integrated Actions. He has participated in, organized and promoted design related exhibitions and meetings. He is scientific coordinator of the 3yr industrial project financed by MIUR, Fondo Agevolazioni per la Ricerca - FAR (Research Relief funds) allocated to the new generation of pre-fabricated systems of eco-orientated constructions; he is scientific coordinator of the industrial project Fotofun financed by the Ministry of Productive Actions, the results of which were partially published in Design Research Maps – Prospects of university research in Italy 2003-2007 by Paola Bertola, Stefano Maffei. Research results are currently undergoing the process of industrial and ornamental patenting for the designed components, classified as “Diamond dual tile PV and Diamond mono tile PV”. He is scientific coordinator of the industrial research project Development and Industrialization of a structural system TENSEGRITY for the realization of large lighting fixture covers, financed by the Ministry of Productive Actions; he is scientific coordinator the Department IDEAS of the project Innovative auxiliary system for the interaction of the physically disabled with computer graphic software financed by MIUR in the framework of the project “New technologies and the Handicapped. He promoted, organized and coordinated several workshops on design: he was project manager for the 1st International Workshop Communicating with industrial areas in the Campania region new tools for visibility and communication for the Industrial district of Sant’Agata de’Goti – Casapulla; he coordinated the workshop “Illywords” under the topic “ the beautiful and well made” in collaboration with the students from the Faculty of Architecture of the Seconda Università di Napoli and with the Italian firm Illycaffè; he coordinated the workshop “Scriptures from John 2006” with the subject “Casablanca” in collaboration with the students from the Faculty of Architecture of the Seconda Università degli Studi di Napoli. He organized and promoted the international workshop HabitatMed in the frame work of the Research Project Euromedsys II, at the l’Institut Supérieur des Beaux Arts de Sousse (Tunisia). At the present, he combines his research activity on product innovation with his didactic activities teaching Design for innovation at the Laboratory of design of product innovation and industrial design, specialistic projects and product management for industrial.



**Paulo Jorge Ferreira**  
University of Texas at Austin, USA

Paulo Jorge Ferreira is currently Associate Professor at the University of Texas at Austin, USA and the Director of the Electron Microscopy facility at the Texas Materials Institute. He has a Ph.D in Materials Science and Engineering from the University of Illinois, USA and has done his Post-doctoral work at MIT in Materials Science and Engineering. He concentrates his scientific research in the areas of Nanomaterials, Nanotechnology and Electron Microscopy applied to Alternative Energy Technologies. At the educational level, he teaches graduate courses in Nanotechnology and is the Assistant Advisor to the Graduate Program in Materials Science and the University of Texas at Austin. In parallel, he has been involved in initiatives with various american and portuguese institutions in the areas of Education and Higher Education, Systems of Innovation, and Science and Technology. He is co-author of three books, namely “Materials 2000”, IST Press, 2003, “Investing in the Future: University-Industry Collaborations in USA and Portugal”; and “Nanotechnology for Architects, Designers and Engineers” with co-authors D. Schodek (Harvard University) and Michael Ashby (University of Cambridge, UK). He is also the author of various scientific articles published in international journals. In addition, Prof. Ferreira is part of the Editorial Board of Review of “Metallurgical and Materials Transactions” and he is a regular reviewer for the journals Acta Materialia, Microscopy Research and Technique, Microscopy and Microanalysis, Journal of Materials Research, Applied Physics Letters, Materials Science and Engineering A and Nanotechnology. Prof. Ferreira has also acted as a special advisor to the Minister of Economics and Innovation, Portugal, on Government Strategy for Science & Technology. His research interests focus on the study of the atomic structure and defect behavior of nanomaterials, used for alternative energy technologies, through in-situ and high-resolution TEM techniques. In particular, I am interested in understanding the relationships between the atomic/nano structure and the properties of nanomaterials, and the fundamental underlying mechanisms of structural and property changes induced by crystalline defects. My experimental work employs various TEM techniques, such as in-situ TEM heating, in-situ TEM nanoindentation, in-situ TEM straining, high-resolution TEM and aberration-free STEM Z-contrast. The focus of the research is in Nanoparticles for Fuel Cells, Batteries and Solar Panels, Nanocrystalline Metals and Metallic Nanoparticles, Copper Nano Interconnects and Carbon Nanostructures.



Rivka Oxman  
Technion Israel Institute of Technology, Israel

Prof. Rivka Oxman from the Faculty of Architecture and Town Planning at the Technion holds B.Sc., M.Sc., and D.Sc. degrees from the Technion Israel Institute of Technology. Prof. Rivka Oxman has been a Vice Dean at the Faculty of Architecture and Town Planning at the Technion. She was a Visiting Professor at Stanford University, USA, Delft University of Technology, the Netherlands; and held research appointments at MIT, USA, Berkeley, USA, Salford University, UK and currently spending a sabbatical at the Graduate School of Design at Harvard University.

Rivka Oxman is an Associate Editor of Design Studies – the international journal for design research in engineering, architecture, products and systems. She is a member of scientific editorial boards of leading international journals and conferences in the field of design. She was appointed as a Fellow of the Design Research Society (FDRS) for her contributions and established record of achievement in design research, and the attainment of international peer recognition as a researcher of professional standing and competence. She has received the Design Research Society and Elsevier Science Award for the best paper of the year in Design Studies.

She is currently conducting research on theories of digital design and exploring the contribution of digital technologies to novel paradigms in design and architecture. Among recent specific research topics, she is investigating the impact of material-based fabrication technologies on novel models of design tectonics.

Her numerous publications are widely cited recognized and influential. Her recent co-authored book “The New Structuralism: Design, Engineering and Architectural Technologies” is a special issue of AD: Architectural Design published by John Wiley, 2010. A forthcoming co-authored book on “Theories of the Digital in Architecture” is published by Taylor and Francis and scheduled to appear at 2014.

She has been invited to deliver keynote lectures around the world. She has been invited to deliver keynote lectures around the world in leading conferences, including USA: ACADIA 2000; Europe: CAAD Futures 1997 and 2011; South America: SIGRADI 2004 and 2009; Australia: CAADRIA 2011; as well as invited lectures at numerous universities and research institutions.



Robert Miles Kemp  
Variate Labs, USA

One of today’s visionary thought leaders in interactive architecture and user experience, Miles has worked at the intersection of digital media, physical architecture and human interaction design for nearly two decades. Miles is the president of award-winning Variate Labs and is currently working on new projects that push the boundaries of interaction design in spatial environments.

Miles has worked on over a hundred projects spanning robotics, architecture, products, vehicles, user experience, software development and video game design. His career includes designing more than sixty built structures, ranging from homes to skyscrapers, and creating next-generation experiences for web, mobile, broadcast and other emerging interactive platforms. In the past, he has worked with many clients, including ABC, Blockbuster, BMW, BBC, Disney, The Bill & Melinda Gates Foundation, Los Angeles Museum of the Holocaust, Microsoft, Samsung, Sony, Target, Televisa, Time Warner and many others.

Miles continues to be an active member of the design and development community through speaking events, publications and online media. In 2009, Miles co-wrote, Interactive Architecture, published by Princeton Architectural Press, the first comprehensive view of the history, present-day and future of interactive space. Miles also maintains the technology blog, Spatial Robots that discusses the future of technology in interactive environments. Widely recognized across many industries for his expertise, Miles has been featured in dozens of international publications and has been a keynote speaker at many conferences, spanning architecture, robotics and interactive media design.

Miles has a Master’s degree from the Southern California Institute of Architecture and a B.S. in Architecture from the University of Maryland, College Park.

## June 26 . 2013

### Auditorium 1

08:00 | 08:45 Conference Registration

08:45 | 09:00 Opening Session

09:00 | 09:50 **Informed Tectonics in Material Based Design.**  
**Rivka Oxman** | Technion Israel Institute of Technology, Israel

09:55 | 10:45 **Digital fabrication and the architectural detail.**  
**Gabriela Celani** | UNICAMP, Brazil

10:45 | 11:00 **Coffee Break**

#### Green Transportation

11:00 | 13:00 **Chair:** David Vale | Faculty of Architecture/Technical University of Lisbon, Portugal

Systematic Approach of Upscaling Aircraft Parts and Sub-Modules to Aircraft Level.  
R. Ilg

Social sustainability: a key concern for the recovery of urban roads.  
A. Annunziata

Modeling complex Aviation Systems – The Eco-Design Tool EcoSky.  
R. Ilg

Recovery Of Roads In Urban Areas: From An Indistinct Feature To A Specific Function.  
A. Annunziata & F. Annunziata

13:00 | 14:15 **Lunch Break**

14:15 | 15:00 **Sustainable work for a human centred manufacturing.**  
**Marco Santochi** | University of Pisa, Italy

15:00 | 15:45 **Envisaging sustainable globalization.**  
**Francesco Jovane** | Politecnico di Milano, Italy

15:45 | 16:00 **Coffee Break**

#### Eco Design and Innovation

16:00 | 18:00 **Chair:** Fernando Moreira da Silva | Fac. Architecture/Technical Univ. of Lisbon, Portugal

New visions in the manufacturing design – Jewels as Multiples.  
C. Scarpitti

Additive manufacturing as a social inclusion tool.  
G. M. Bem, R. T. Pupo & A. T. C. Pereira

Patterns of sustainability in textile design use of traditional technologies.  
A. Rusu

Eco-design concept manual as a web tool to reduce the impact of a product on the environment.  
Z. Tončíková

## Auditorium 2

10:45 | 11:00 **Coffee Break**

#### Renewable Energy Technologies

11:00 | 13:00 **Chair:** José Pinto Duarte | Faculty of Architecture/Technical University of Lisbon, Portugal

Use of Jathropha biomass for adsorption of glyphosate in water.  
H. Nacke, A. C. Gonçalves Jr., D. Schwantes, G. F. Coelho, M. R. Silva & A. Pinheiro

Modeling of multi-assortment production of CO<sub>2</sub>-extract's.  
E. P. Koshevoy, V. S. Kosachev, V. U. Chundyshko & N. N. Latin

To develop a framework for the implementation of Miscanthus-fuelled ESCOs for non-domestic heat in Ireland – state of the art report.  
E. Stilwell & D. O'Sullivan

Comparison of working (operating) efficiency of electric and gas heat pump regarding to renewable heat source.  
D. Rajković & M. Sentić

15:45 | 16:00 **Coffee Break**

#### Energy Efficiency

16:00 | 18:00 **Chair:** Marco Santochi | University of Pisa, Italy

Spectral Shifters for an enhanced Indoor Environment.  
G. R. Mitchell & F. J. Davis

Electrical energy analysis and potential environmental improvements of sheet metal punching processes.  
G. Ingarao, K. Kellens, R. Renaldi, W. Dewulf & J.R. Duflou

A linear reciprocating thermomagnetic motor powered by water heated using solar energy.  
L. D. R. Ferreira, C. V. X. Bessa, I. Silva & S. Gama

Optimalmould | Energy Consumption in Injection Moulding Optimization.  
C. Ramos, P. Carreira, P. Bártolo, I. Reis, L. Durão & N. Alves

Prototypelab 2012: Mass-customization of energy self-sufficient prototypes and less environmental impact through improved parametric tools, sensors and CNC technology.  
J. Ballesteros & P. Ferreiro

## June 26 . 2013

### Auditorium 3

10:45 | 11:00 **Coffee Break**

#### Smart Design

11:00 | 13:00 **Chair:** Gabriela Celani | UNICAMP, Brazil

How to design smart-buildings without smart-people?  
M. C. Zélem

Designing a sustainable and healthy living environment with smart technology.  
J.H. Lan

Fabricating Selective Elasticity.  
M. P. Gutierrez

The limits of inclusive design in the current design practice.  
E. Zitkus, P. Langdon & P. J. Clarkson

15:45 | 16:00 **Coffee Break**

#### Green and Smart Manufacturing

16:00 | 18:00 **Chair:** Francesco Jovane | Politecnico di Milano, Italy

Compressed air system assessment for machine tool monitoring.  
A. Gontarz, P. Bosshard, K. Wegener & L. Weiss

Crop rotation and association design for N budgeting in organic dairy farms.  
G. Bukvić, R. Gantner, Z. Steiner & K. Karalić

System –based analysis of environmental effects of liquid food packaging.  
Z. Bogóné-Tóth & Z. Lakner

Rapid Construction with Functionally Graded Designs.  
F. Craveiro, H. A. Almeida, L. Durão, H. Bártolo & P. Bártolo

## Auditorium 4

10:45 | 11:00 **Coffee Break**

#### Sustainable Business Models

11:00 | 13:00 **Chair:** Mohamed Hussein | University of Connecticut, USA

Managerial decision support tools for sustainable actions.  
M. Dolinsky & V. Dolinska

Eco-efficiency in Six Small and Medium Enterprises in Mexico.  
L. Iturbide, P. Lozoya & P. Baptista

Collaborative actions, technology and smart design.  
I. S. L. Xavier & P. J. Silva Junior

Sustainable Supply Chain and Collaboration: what is the link and what are the benefits?  
Y. Dwi, I. Nouaouri, H. Allaoui & G. Goncalves

A method to select best nuggets from eco-innovation sessions.  
F. Vallet, B. Tyl, D. Millet & B. Eynard

15:45 | 16:00 **Coffee Break**

#### Smart Materials

16:00 | 18:00 **Chair:** Paulo Bártolo | CDRSP/Polytechnic Institute of Leiria, Portugal

Advanced smart polymer/nanographite composites for environmental pollution control.  
M. Knite, J. Zavickis, G. Sakale, K. Ozols & A. Linarts

Photocatalytic degradation of textile effluent using ZnO/NaX and ZnO/AC under solar radiation.  
T. M. P. Schmidt, F. R. Soares, V. Slusarski-Santana, F. F. Brites-Nóbrega & N. R. C. Fernandes-Machado

New patent on nanomaterials for preserving stone and wood structures.  
S. Di Salvo

Biomimetic materials for design.  
L. Pietroni & J. Mascitti

Novel plastics for sustainable building design.  
G. R. Mitchell



## June 26 . 2013

### Auditorium 5

10:45 | 11:00 **Coffee Break**

#### **Reuse and Recycling Techniques**

11:00 | 13:00 **Chair:** Jorge de Brito | IST, Technical University of Lisbon, Portugal

Kinetics, equilibrium and thermodynamics of cadmium adsorption by a biosorbent from the bark of *Pinus elliottii*.

L. Strey, A. C. Gonçalves Jr., D. Schwantes, G. F. Coelho, H. Nacke & D. C. Dragunski

Equilibrium of the adsorption process of Glyphosate using wastes from the cassava industry.

D. Schwantes, A. C. Gonçalves Jr., G. F. Coelho, J. Casarin, J. R. Stangarlin & A. Pinheiro

Physical properties of aqueous mixtures of lignin and calcium hydroxide for their use as insulators in building.

I.C. Garcés, A. Legido, J. L. Legido & J. García

Controlling the properties of Materials manufactured using Recycled PVC.

C.M.Pratt, F.J. Davis & G.R. Mitchell



19:00 **Reception Dinner**

#### **MUDE, Museu do Design e da Moda**

Rua Augusta, 24

1100 - 053 Lisboa

<http://www.mude.pt/>



## June 27. 2013

### Auditorium 1

|               |  |
|---------------|--|
| 09:00   09:50 | Design Prototyping = Design Construction.<br><b>Lawrence Sass</b>   MIT, USA   |
| 09:55   10:45 | Interactive facades and the future of spatial media.<br><b>Robert Kemp</b>   Variate Labs, USA   |
| 10:45   11:00 | Coffee Break   |
| 11:00   13:00 | <b>Eco Design and Innovation</b><br><b>Chair:</b> Regiane Pupo   Federal University of Santa Catarina, Brazil<br><br>Self-building process: living the crisis in a sustainable way.<br>F. Pugnali, E. Bellu & M. Giovanelli<br><br>A visual impaired children photography's catalogue as an inclusive tool.<br>A. P. P. Demarchi, B. M. Rizardi, G. Pires & C. B. R. Fornasier<br><br>Door's design for people with mobility impairments and service dogs.<br>C. P. Carvalho, A. B. Magalhães, J. B. Pedro & L. de Sousa<br><br>Designing innovation with craft-evolution to develop sustainability.<br>E. Aparo, L. Soares & H. Santos-Rodrigues<br><br>Back to craft<br>E. Karanastasi, M. Moelee, S. Alexopoulou, M. Kardarakou, M. Nikolakaki, A. Papadopoulou, X. Papatriantafyllou & A. Terezaki |
| 13:00   14:15 | Lunch Break  |
| 14:15         | Leiria   |

#### CDRSP – Center for Rapid and Sustainable Product Development

2430-028 - Marinha Grande, Portugal

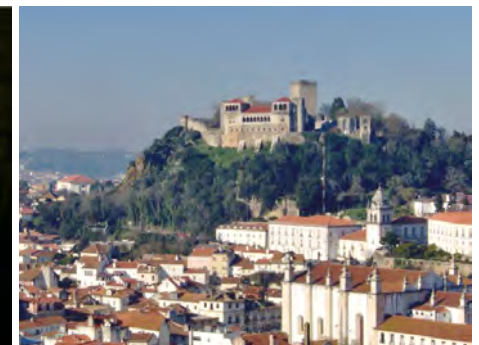
<http://cdrsp.ipleiria.pt/>

and

#### Castle of Leiria

## Auditorium 2

|               |  |
|---------------|--|
| 10:45   11:00 | Coffee Break   |
| 11:00   13:00 | <b>Green and Smart Manufacturing</b><br><b>Chair:</b> Marco Santochi   University of Pisa, Italy<br><br>Synthetic Manufacturing – Resilient Modular Systems (RMS).<br>W. W. Fok<br><br>Influencing variables on sustainability in additive manufacturing.<br>S. Junk & S. Côté<br><br>Environmental aspects of lightweight construction in mobility and manufacturing.<br>S. Albrecht, M. Baumann, C. P. Brandstetter, R. Horn, H. Krieg, M. Fischer & R. Ilg<br><br>Package Design for frozen foods - principles for sustainability.<br>R. A. Delfino, L. C. Paschoarelli & R. Frazão<br><br>A Study of Injection Moulding with Bismuth Alloy.<br>A. Kus, E. Unver, B. Jagger & I. Durgun |
| 13:00   14:15 | Lunch Break  |



## June 27. 2013

### Auditorium 3

10:45 | 11:00 **Coffee Break**

#### Green Transportation

11:00 | 13:00 **Chair:** Robert Miles Kemp | Variate Labs, USA

New York City blue network: water as liquid state of earth.  
M. Louro & F. Oliveira

An Innovative Six Sigma and Lean Manufacturing Approach for Environmental Friendly Shipyard.  
L. Bilgili, D. Deli & U. B. Celebi

Life Cycle Assessment Approach of Waste Management for Ship Operation.  
L. Bilgili & U. B. Celebi

An Innovative Method Establishment for a Green Shipyard Concept.  
L. Bilgili & U. B. Celebi

Sustainable mobility.  
António Costa, Toyota Portugal

13:00 | 14:15 **Lunch Break**

14:15 **Leiria**

### Auditorium 4

10:45 | 11:00 **Coffee Break**

#### Renewable Energy Technologies

11:00 | 13:00 **Chair:** Geoffrey Mitchell | CDRSP/Polytechnic Institute of Leiria Portugal

Removal of cadmium from aqueous solutions by adsorption on Jatropha biomass.  
H. Nacke, A. C. Gonçalves Jr., G. F. Coelho, L. Strey, D. Schwantes & A. Laufer

Guidelines for redesign a commercially available product: The case of a split air conditioning unit.  
P. N. Botsaris

System of thermal energy accumulation in a soil layer in a combination with wind energy.  
A. V. Bunyakin

Natural ventilation potential on thermal comfort of a light-steel-framing residential building.  
A. Craveiro, A. Gameiro Lopes, P. Santos & L. Simões da Silva

Analysis of the Ethanol production chain in the State of Rio Grande do Sul, Brazil: a study based on system's dynamics with a view for exploring scenarios.  
A. Longhi, G. L. R. Vaccaro, T. Fleck, K. Roos, D. C. Azevedo & M. H. C. Moutinho

13:00 | 14:15 **Lunch Break**

## June 28 . 2013

### Auditorium 1

|               |   |
|---------------|---|
| 09:00   09:50 | Energy and resource efficient manufacturing: a multi-strategy approach.<br><b>Joost Duflou</b>   University of Leuven, Belgium  |
| 09:55   10:45 | Nanotechnology: Science or Fiction?<br><b>Paulo Ferreira</b>   University of Texas at Austin, USA   |
| 10:45   11:00 | Coffee Break  |
| 11:00   13:00 | <b>Energy Efficiency</b><br><b>Chair:</b> Vasco Rato   ISCTE - Lisbon University Institute, Portugal<br><br>A bottom-up perspective upon climate change – approaches towards the local scale and microclimatic assessment.<br>A. S. Nouri<br><br>Energy Price Differential and Industrial Production Growth in Mexico: A Wavelet Approach.<br>G. S. Uddin, S. Chakraborty, R. Hossian & B. Sjö<br><br>Daylighting and ventilation in energy efficient factories.<br>K. Klimke, T. Rössel, P. Vohlidka & H. Riemer<br><br>Environmental quickscans as a decision supporting tool – Scanning the embodied energy of different fibre treatments in the development of biocomposite building products.<br>E. E. Keijzer |
| 13:00   14:15 | Lunch Break   |
| 14:15   15:00 | Rethink the design for the sustainable innovation.<br><b>Mario Buono</b>   Seconda Università degli Studi di Napoli, Italy  |
| 15:00   15:45 | Practice in sustainable automotive manufacturing.<br><b>Giuseppe D'Angelo</b>   FIAT Research Center, Italy   |
| 15:45   16:00 | Coffee Break  |
| 16:00   18:00 | <b>Eco Design and Innovation</b><br><b>Chair:</b> Rita Almendra   Fac. Architecture/Technical Univ. of Lisbon, Portugal<br><br>Sustainability @ Portugal Telecom.<br>Teresa Salema, Portugal Telecom<br><br>Communicating effectively in writing: issues and strategies for engineers.<br>L. Nazarenko & G. Schwarz-Peaker<br><br>In Direction to Sustainable Eco Resorts.<br>C. Alho & J. C. Pina<br><br>The Meaning of Public Spaces.<br>M. Hanzl<br><br>Urban Nomads - Smart and Flexible Design Strategies for a Sustainable Future.<br>N. Loeper & M. Ott  |

## Auditorium 2

|               |  |
|---------------|--|
| 10:45   11:00 | Coffee Break   |
| 11:00   13:00 | <b>Life-Cycle Engineering</b><br><b>Chair:</b> Joost Duflou   University of Leuven, Belgium<br><br>Manufacturing Renaissance: Return of manufacturing to western countries.<br>B. Kianian, T. C. Larsson & M. H. Tavassoli<br><br>Life-cycle Management of High-performance and Sustainable Buildings Based on Enterprise Modeling Method.<br>Y. M. Shao<br><br>Set up of an European LCA Building Rating Methodology within the Open House Project.<br>J. Gantner, K. Lenz & H. Krieg<br><br>Evaluating the impact of glass and PET packaging for bottled water.<br>H. A. Almeida, C. A. Ramos, H. Bártolo & P. J. Bártolo  |
| 15:45   16:00 | Coffee Break   |
| 16:00   18:00 | <b>Green and Smart Manufacturing</b><br><b>Chair:</b> Giuseppe D'Angelo   FIAT Research Center, Italy<br><br>A step towards sustainable machining through increasing the cutting tool utilization.<br>F. Schultheiss, J. M. Zhou, E. Gröntoft & J. E. Ståhl<br><br>Natural Aspect of Sustainable Food and Cosmetics Manufacturing.<br>K. Kyriakopoulou, S. Papadaki & M. Krokida<br><br>Cobalt and manganese recovery from spent industrial catalysts by hydrometallurgy.<br>D. Fontana & F. Forte<br><br>The Olivetti factory as a paradigm of sustainable growth.<br>F. Castanò & A. Gallo<br><br>Disruptive innovation and learning to create architectural forms.<br>L. S. Leite; A. T. C. Pereira & R. Pupo |

## June 28 . 2013

### Auditorium 3

10:45 | 11:00 **Coffee Break**

#### Reuse and Recycling Techniques

11:00 | 13:00 **Chair:** Paulo Bártolo | CDRSP/Polytechnic Institute of Leiria, Portugal

Use of bark of *Pinus elliottii* as a biosorbent in the removal of glyphosate from aqueous solutions.

L. Strey, A. C. Gonçalves Jr., G. Coelho, D. Schwantes, H. Nacke & C. R. T. Tarley

Kinetics, equilibrium and thermodynamics of the adsorption process of lead using cassava industry wastes.

D. Schwantes, A. C. Gonçalves Jr., L. Strey, V. Schwantes & H. Nacke

Design of experimental composting of animal carcasses in university unit of treatment aimed a correct final disposition and soil improve.

J. C. L. Fonseca, M. R. R. Marchi, L. T. Braz, A. A. Cecilio & L. V. S. Sacramento

Adaptation of the creativity tool ASIT to support eco-ideation phases.

B. Tyl, J. Legardeur, D. Millet & F. Vallet

15:45 | 16:00 **Coffee Break**

#### Sustainable Business Models

16:00 | 18:00 **Chair:** Gideon N. Levy | CDRSP/Polytechnic Institute of Leiria, Portugal

Multi-criteria evaluation of reaction to the economic recession in modernization of multi-apartment buildings.

L. Kelpsiene & M. L. Matuseviciene

Sustainable development and business: Past and Future.

M. Leščevica

Assessment of the costs and benefits of environmental investment.

M. E. Hussein, G. S. Seow & K. Tam

Corporate sustainability measurement in Portuguese manufacturing organizations.

P. Mamede & C. F. Gomes

An economic approach on the urban development of squatter settlements in hillsides high-risk areas.

S. R. Soares & S. T. Moraes

## Auditorium 4

10:45 | 11:00 **Coffee Break**

#### Smart Design

11:00 | 13:00 **Chair:** Rivka Oxman | Technion Israel Institute of Technology, Israel

Freeform 3D Printing: Towards a Sustainable Approach to Additive Manufacturing.  
N. Oxman, J. Laucks, M. Kayser, E. Tsai & M. Firstenberg

The haptic/ visual image as an inclusive tool.

A. P. P. Demarchi, B. S. Pozzi & C. B. R. Fornasier

The Industrial Engineering: Sustainable Factor in the Process.

A. Vargas & J. A. Loredó

Digital fabrication and rapid prototyping as a generative process.

F. Coutinho, M. Kruger & J. P. Duarte

Digital manufacture: Robotic CAD/CAM protocol for low cost housing.

V. Portugal

15:45 | 16:00 **Coffee Break**

#### Sustainable Construction

16:00 | 18:00 **Chair:** Robert Miles Kemp | Variate Labs, USA

3 Scales of Repurposed Disposability – Construction, Renovation, and Demolition (CRD).

W. W. Fok

Towards Zero Energy House Integrated Design: Parametric Formwork for Capillary Systems in Precast Concrete Panels.

C. Beorkrem & M. Azarbayjani

Sustainable design of prefabricated solutions for the rehabilitation of ancient buildings.

A. C. Coelho, J. M. Branco, P. B. Lourenço & H. Gervásio

Architectural rehabilitation and NZEB: the expansion of the Library of FDUL.

A. P. Pinheiro

Smart Technology for the passive house.

S. Vattano

## June 28 . 2013

### Auditorium 5

10:45 | 11:00 **Coffee Break**

#### **Smart Materials**

11:00 | 13:00 **Chair:** Paulo Jorge Ferreira | University of Texas at Austin, USA

Behavior of High Strength Concrete with Raw Rice Husk Exposed to High Temperature Effect.

B. Ucakosar, N. Yuzer & N. Kabay

Transparent and sustainable materials.

A. L. Volpe

Particle Model for Orange Peel Pyrolysis.

J. A. Rodríguez, J. A. Loredó & R. C. Miranda

Phase Change Materials as a tool for Climate Change Mitigation.

A. P. Viera, H. Bártolo, G. R. Mitchell & P. Bártolo

19:00 **Gala Dinner**

#### **Castelo de S. Jorge**

Rua de Santa Cruz

1100-129 Lisboa

<http://www.castelodesaojorge.pt/>



## June 29 . 2013

### Auditorium 1

|               |  |
|---------------|--|
| 09:00   09:50 | Design Democracy.<br><b>Branko Kolarevic</b>   University of Calgary, Canada   |
| 09:55   10:45 | Challenges and technologies of the city of tomorrow.<br><b>Klaus Sedbauer</b>   Fraunhofer-Institut für Bauphysik IBP, Germany   |
| 10:45   11:00 | Coffee Break   |
| 11:00   13:00 | <b>Life-Cycle Engineering</b><br><b>Chair:</b> Gideon N. Levy   CDRSP/Polytechnic Institute of Leiria, Portugal<br><br>Assessment tool for building materials.<br>S. Vasconcelos, C. Alho & B. Müller<br><br>Environmental Management and use of the water in Food Service Segment: the Life Cycle Assessment as a tool for a sustainable development.<br>M. S. Lourenço, S. R. R. Costa, M. L. Nunes, L. S. Xavier & J. A. A. Peixoto<br><br>Objective Monetization of Environmental Impacts.<br>H. Krieg, S. Albrecht, M. Jäger & J. Gantner<br><br>Process chain analysis of lightweight metal components – A case study.<br>R. Ilg & D. Wehner |
| 13:00   14:15 | Closing Ceremony   |

### Auditorium 2

|               |   |
|---------------|---|
| 10:45   11:00 | Coffee Break  |
| 11:00   13:00 | <b>Sustainable Construction</b><br><b>Chair:</b> Branko Kolarevic   University of Calgary, Canada<br><br>New paradigms in post-hydrological disaster shelter practice; hydrological disasters & informal urban settlements – An insoluble problem?<br>J. Lacey & A. Read<br><br>On- demand post-disaster emergency shelters.<br>M. Tafahomi<br><br>Sustainable by Nature.<br>Carlos Manuel, AISOL, Group Amorim<br><br>Mass customization of ceramic tableware through digital technology.<br>E. Castro e Costa & J. P. Duarte<br><br>Improving urban environment with green roofs.<br>G. Darázs & I. Hajdu |



## June 29 . 2013

### Auditorium 3

10:45 | 11:00 **Coffee Break**

#### Smart Design

11:00 | 13:00 **Chair:** Geoffrey Mitchell | CDRSP/Polytechnic Institute of Leiria, Portugal

Robotically Controlled Fiber-based Manufacturing as Case Study for Biomimetic Digital Fabrication.

N. Oxman, M. Kayser, J. Laucks & M. Firstenberg

Climate change adaptation and strategies: an overview.

A. S. Nouri & M. M. Silva

Space time information on display: smart devices and spatial cognition.

D. P. Henriques

Architectural fabrication of tensile structures with flying machines.

A. Mirjan, F. Gramazio, M. Kohler, F. Augugliaro & R. D'Andrea

13:00 | 14:15 **Closing Ceremony**

## Auditorium 4

10:45 | 11:00 **Coffee Break**

#### Sustainable Business Models

11:00 | 13:00 **Chair:** Mohamed Hussein | University of Connecticut, USA

Integrated environmental and economic assessment in the construction sector.

H. Krieg, S. Albrecht, J. Gantner & W. Fawcett

Parametric Places 22@: Smart Urban Analysis Tools and Place Brand-ing Value.

P. Speranza

Collaborative Development of Advanced Manufacturing Technologies.

José Carlos Caldeira, Productech Cluster

Implementing Concurrent Engineering in the Construction Industry: A different approach for a better consideration of users.

X. Latortue & S. Minel

Exploring Green IT and Green IS: insights from a case study in Brazil.

T. A. Viaro & G. L. R. Vaccaro



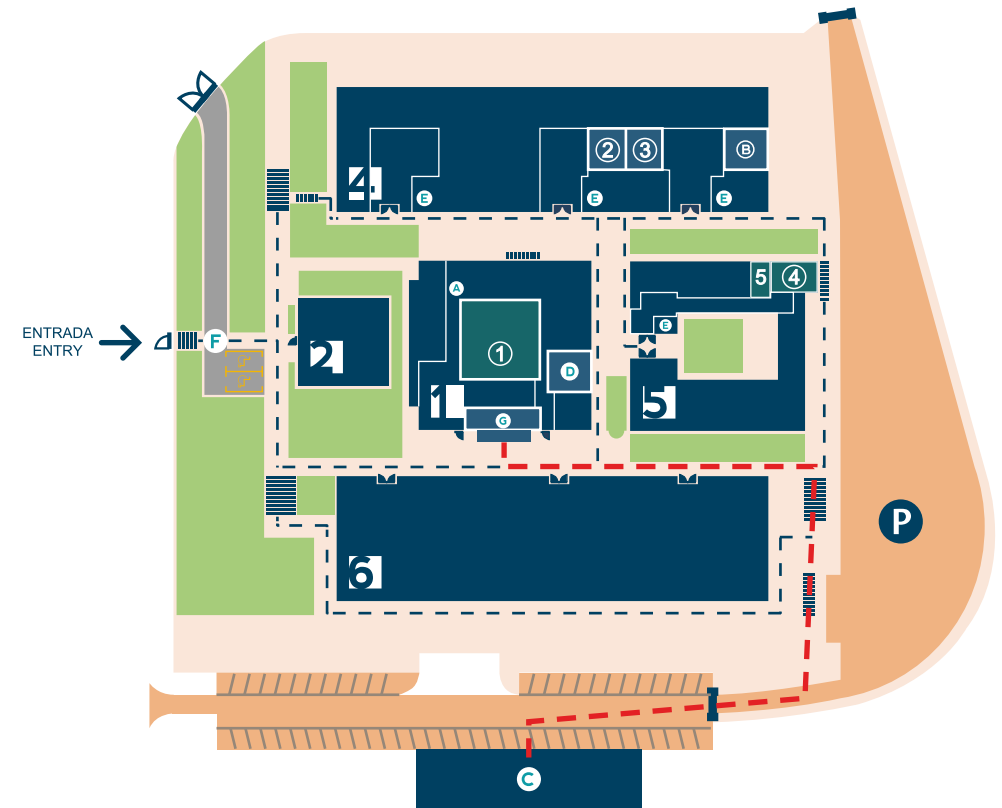
Main Building



Auditorium Building Blocks



## Conference Areas



- ① Auditorium 1 | 2nd floor
- ② Auditorium 2
- ③ Auditorium 3
- ④ Auditorium 4 | 2nd floor
- ⑤ Auditorium 5 | 2nd floor

- Ⓐ Reception / Secretariado | 2nd floor
- Ⓑ Study Area / Zona de Estudo
- Ⓒ Refectory / Cantina
- Ⓓ Computer Room / Sala de Computadores
- Ⓔ WC
- Ⓕ Meeting Point / Ponto de Encontro
- Ⓖ Coffee Break

--- Way to Refectory / Percurso para a Cantina

## General Information

## Internet Access:

Choose the network "eduroam-guest" | does not require any configuration.

SIM 2013 Secratariaat:

The SIM secretariat will be located on the 2nd floor, near the Auditorium 1.

e-mail: [organization.sim@ipleiria.pt](mailto:organization.sim@ipleiria.pt)

Faculdade de Arquitectura

Universidade Técnica de Lisboa

Rua Sá Nogueira, Pólo Universitário - Alto da Ajuda

1349-055 Lisboa

Tel. +351 213 615 000

<http://www.fa.utl.pt/>

## CDRSP

Centre for Rapid and Sustainable Product Development

Polytechnic Institute of Leiria

Centro Empresarial da Marinha Grande - Zona Industrial

2430-028 Marinha Grande - Portugal

Tel. +351 244 569 441

[www.cdrsp.ipleiria.pt](http://www.cdrsp.ipleiria.pt)

Hospital

Centro Hospitalar de Lisboa Ocidental, EPE - Hospital de São Francisco Xavier

Estrada Forte do Alto do Duque - São Francisco Xavier

+00351 210 431 000

## Pharmacy

Farmácia Boa Hora – Rua dos Quartéis 25 Ajuda

+351 213 617 130

## Emergencies

SOS – Emergencies: 112

Intoxications: +351 808 250 143

Lisbon Fire Brigade: +351 218 171 422

Local Police - Belém: +351 213 619 626

## Conference BUS

A free shuttle service will be made available to participants, taking them to the conference venue in the morning and back to central Lisbon at the end of the day. The pick-up point will be the Hotel Fenix Lisboa.

Hotel Fénix Lisboa | Praça Marquês Pombal 8 | 1269-133 Lisboa

## Timetable

June 26 at 8.00am

June 27 at 8.15am

June 28 at 8.15am

June 29 at 8.15am



Taxis:

Taxiking Phone - Central de Táxis de Lisboa: +351 218 598 693

Radio-Táxis Lisboa: +351 218 119 000

Autocoope-Cooperativa de Táxis de Lisboa: +351 217 932 756

Teletáxis-Cooperativa de Serviços: +351 218 111 100