

# 5<sup>th</sup> International Symposium Formal Methods in Architecture

October 15<sup>th</sup>-16<sup>th</sup> 2020, ISCTE-IUL, Lisbon, Portugal

Participant Guide Book



## Symposium Purpose

The main purpose of this symposium is a contribution to the debate in the fields of Architecture and Urbanism on the application of new formal methods to emerging societal and technical problems. Formal methods will be focused on methodological advances based on new developments coming from collaborative work with Mathematics and Computer Sciences which enables several different grades of abstraction and formalization. From the millennial geometry to current shape grammars, several formal approaches to Architecture and Urbanism are welcome to be presented. The aim of the symposium is to discuss, disseminate and promote the use of formal methods in the creation of new explicit languages for problem-solving in Architecture and Urbanism. We will discuss current problems in the field and the potentials and drawbacks of the use of formal methods to address them. These problems range from production, sustainability, representation, communication, heritage among others, never ceasing to see Architecture and Urbanism as technological activities and well as artistic ones.

## Symposium Topics

Collection of information;  
Semantic organization of information;  
Syntactically and semantically formal languages;  
Representation, visualization and interaction;  
Architectural design automation;  
Building performance analysis;  
SCAVA-Space Configuration, Accessibility and Visibility Analysis;  
Active management of the built environment.

## Committees

### Chairs

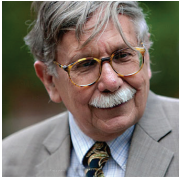
**Sara Eloy** (ISCTE-IUL, ISTAR-IUL)  
**David Leite Viana** (ISTAR-IUL)  
**Franklim Morais** (ESAP)  
**Jorge Vieira Vaz** (ESAP)

### Organizing committee

**Sara Eloy** (ISCTE-IUL, ISTAR-IUL)  
**David Viana** (ISTAR-IUL)  
**Joana Alves** (ISCTE-IUL, ISTAR-IUL)  
**Maria João Oliveira** (ISCTE-IUL, DINÂMIA-CET)  
**Franklim Morais** (ESAP)  
**Catarina Ruivo** (CIAUD-FAUL)  
**Canan Colaço** (ISTAR-IUL)



## KeyNote Speakers



### Reinhard Goethert

Reinhard Goethert is internationally recognized in physical planning and upgrading of low-income settlements, in physical design and in participatory technique in urban development. He is Principal Research Associate in the School of Architecture and Planning at the MIT.



### Maria Lopez

María López Calleja studied architecture at the Technical University of Valencia and has worked for MVRDV since 2008. López is also responsible for the development and implementation of BIM as a design tool.



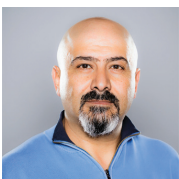
### José Duarte

José Pinto Duarte is the Stuckeman Chair in Design Innovation and director of the Stuckeman Center for Design Computing (SCDC). He has served as president of eCAADe, helped establish the M.I.T.–Portugal program, and created the Design and Computation research group in Lisbon.



### Tasos Varoudis

Tasos Varoudis is a Senior Fellow at UCL and since 2011 he drives the spatial and architectural computation research for the Space Syntax Laboratory at the Bartlett School of Architecture (UCL) where he is developing new methodological and computational innovations combining spatial data-driven models with machine learning and agent-based models.



### Ramzi Hassan

Ramzi Hassan is the founder and leader of the Virtual Reality Lab at NMUB. His research, teaching and publications focus on digital applications for landscape and urban design.



## Schedule

Paquete de Oliveira Auditorium		
	October 15 <sup>th</sup>	October 16 <sup>th</sup>
8:30 - 9:00	Check-in	
9:00 - 9:15	opening session	9:00 - 11:00 KeyNote <b>Maria Lopez (MVRDV)</b>
9:15 - 10:45	session <b>01</b>	KeyNote <b>Tasos Varoudis (UCL)</b>
10:45 : 11:15	break	11:00 - 11:30 break
11:15 - 12:45	session <b>02</b>	11:30 : 13:00 session <b>05</b>
12:45 - 13:30	lunch	13:00- 13:45 lunch
13:30 - 15:00	KeyNote <b>Reinhard Goether (MIT)</b>	13:45 - 14:45 KeyNote <b>Ramzi Hassan (NMBU)</b>
	KeyNote <b>José P. Duarte (Penn State)</b>	14:45 - 15:00 break
15:00 - 15:30	break	15:00 - 16:45 session <b>06</b>
15:30 - 17:30	session <b>03</b>	16:45 - 17:15 break
17:30 : 18:00	break	17:15 - 18:45 session <b>07</b>
18:00 - 19:30	session <b>04</b>	18:45 : 19:15 closing session

## Book of Abstracts

Handle: <http://hdl.handle.net/10071/19842>

Free Download



## October 15<sup>th</sup> - sessions Map

### session 01

- 9:15 - 9:30 Mathematically developing building facades: an algorithmic framework,  
by Inês Caetano and António Leitão
- 9:30 - 9:45 DESIGN TO EXPERIMENT, EXPERIMENT TO DESIGN Tool-user, Tool-breaker, Tool-designer,  
by Ekin Ünlü and Sema Alaçam
- 9:45 - 10:00 Tectonics of differential growth. Folds in additive fabrication and moulding for architectural design,  
by Shota Tsikoliya, Imrich Vaško, Daniel Svitak and Petra Sochurkova
- 10:00 - 10:15 Agent-based Semiology: Optimizing Office Occupation Patterns With Agent-based Simulations,  
by Robert Neumayr
- 10:15 - 10:45 Discussion  
Moderator: Jorge Vaz

### session 02

- 11:15 - 11:30 Reconstructing photogrammetric 3D model by using deep learning,  
by June-Hao Hou and Chi-Li Cheng
- 11:30 - 11:45 Spectral Clustering and Integration - The inner dynamics of computational geometry and spatial morphology, by Tasos Varoudis and Alan Penn
- 11:45 - 12:00 LBD server: Visualising Building Ontologies in web-based environments using glTF-models,  
by Andrew Malcolm, Pieter Pauwels and Jeroen Werbrouck
- 12:00 - 12:15 ScavaTools: Strategies and Tools for the Mass Dissemination of SCAVA Techniques,  
by Catarina Ruivo, David Viana, Franklim Morais, Isabel Carvalho, Jorge Vaz
- 12:15 - 12:45 Discussion  
Moderator: Ricardo Resende

### session 03

- 13:30 - 13:45 Building Circulation from a Syntactic Context in Relation to Indoor Thermal Environment,  
by Leen Hiasat and Pedro Januário
- 13:45 - 14:00 What about if buildings respond to my mood?  
by Luisa Almeida and Sara Eloy
- 14:00 - 14:15 Nature Pleated Surfaces,  
by Maria João de Oliveira and Filipa Crespo Osório
- 14:15 - 14:30 Borealis Sound an Interactive Wall for Situational Awareness: the Impact of Responsive Architecture on Users, by Beatriz Couto and Sara Eloy
- 14:30 - 15:00 Discussion  
Moderator: Rosália Guerreiro



## October 15<sup>th</sup> - sessions Map

### session 04

- 18:00 - 18:15 Tools for the Co-designing of Housing Transformations: a Study on Interaction and Visualization Modes,  
by Sara Eloy, Micaela Raposo, Fábio Costa, Pieter Vermaas
- 18:15 - 18:30 Topologic: Exploring spatial reasoning through geometry, topology, and semantics,  
by Wassim Jabi and Aikaterini Chatzivasileiadi
- 18:30 - 18:45 A framework for interactive spatial agents,  
by Pedro Cvb-Veloso and Ramesh Krishnamurti
- 18:45 - 19:00 BIM based Airport Project Standardization (IFC) for use of Code Checking,  
by Ítalo Guedes, Max Andrade and Adriana Carvalho
- 19:00 - 19:30 Discussion  
Moderator: Maria João de Oliveira



## **October 16<sup>th</sup> - sessions Map**

### **session 05**

- 11:30 - 11:45 Non-intrusive Semi-automated Modelling of Ordinary Buildings' Intermediate Floors: Collective Housing in Porto, Portugal, by David Pereira-Martinez, Gisela Lameira, Plácido Lizancos, Isabel Raposo, Virgílio Borges Pereira
- 11:45 - 12:00 The Use of Public Space: The Vitality of Urmia Bazaar, by Momen Foadmarashi and Francisco Serdoura
- 12:00 - 12:15 Data Driven Spatial Analysis of Urban Renewal. Network Kernel Density Estimation of Building Renovation, by Ricardo Mendes Correia, Rosália Guerreiro and Filipe Brandão
- 12:15 - 12:30 Space, Adaptability and Use: Triangulating research criteria for adaptability retrieval, by Carolina Coelho
- 12:30 - 13:00 Discussion  
Moderator: Canan Colaço

### **session 06**

- 15:00 - 15:15 L'Objet Invalide, by Aniruddha Mukherjee
- 15:15 - 15:30 Methodological Relationships between Design Participation and Computation in Architecture, by Canan Colaco and Zeynep Mennan
- 15:30 - 15:45 Urban forms of informality: decoloniality as a perspective for morphological studies, by Silvia Spolaor and Vitor Oliveira
- 15:45 - 16:00 Differences in Sensory Intelligence between Human and Machinic Actors in Design Processes, by Egemen Berker Kizilcan
- 16:00 - 16:15 Digital Doxiadis: Parametric Thinking for Human Settlements, by Alexandros Peteinarelis and Nikolaos Patsavos
- 16:15 - 16:45 Discussion  
Moderator: Franklim Morais

### **session 07**

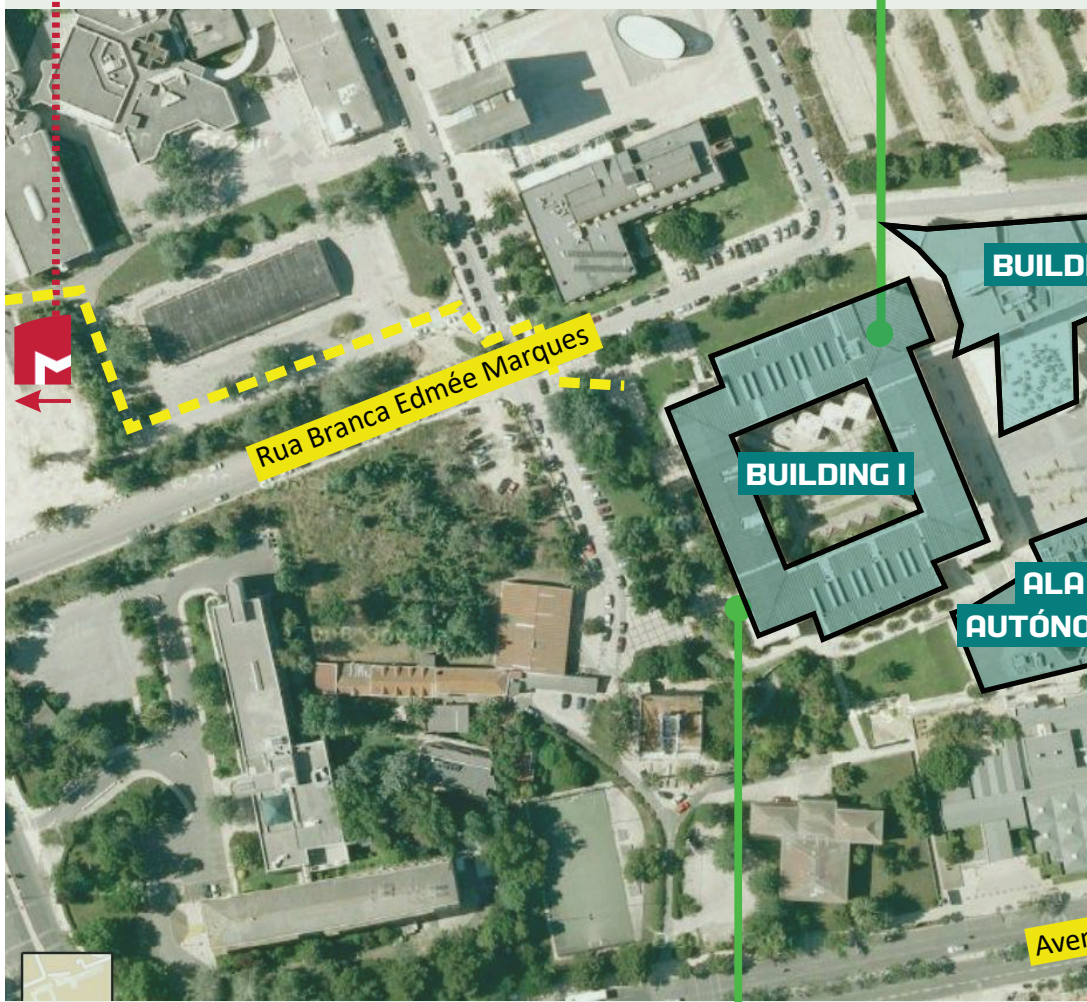
- 17:15 - 17:30 Adapting Analysis Workflows to Humanitarian Needs: Different Road Network Models and Tools, by Camilla Pezzica, Valerio Cutini, Clarice Bleil de Souza, Alessandro Santucci
- 17:30 - 17:45 Understanding a bastion castle in Pidhirtsi using the Space Patterns system for spatial analysis, by Olha Tikhonova
- 17:45 - 18:00 Multi-scale configurational approach to the design of public open spaces after urban disasters, by Chiara Chioni, Camilla Pezzica, Valerio Cutini and Clarice Bleil de Souza
- 18:00 - 18:15 Development impact: Applying network analysis to urban migration data, by Susannah Cramer-Greenbaum
- 18:15 - 19:15 Discussion  
Moderator: Catarina Ruivo





NORTH ENTRANCE  
Sedas Nunes Building  
0 Floor  
Paquete de Olivais

Cidade Universitária  
Subway Station



BUILDING I

BUILDING

ALA  
AUTÓNOMA

Avenida

MAIN ENTRANCE  
Building Sedas Nunes  
1st Floor





ANCE  
Building  
eira Auditorium

Entrecampos  
Subway Station



SOUTH ENTRANCE  
Building II  
2nd Floor

**ISCTE-IUL ACCESSSES**



## And if you still got some time, we suggest you:

- 01** CHAMPALIMAUD FOUNDATION  
- CENTER FOR THE UNKNOWN  
(CHARLES CORREA, 2010)  
Av. Brasília, Belém
- 02** BELÉM CULTURAL CENTER  
(VITTORIO GREGOTTI AND MANUEL SALGADO, 1983-93)  
Praça do Império, Belém
- 03** NATIONAL COACH MUSEUM  
(PAULO MENDES DA ROCHA AND BAK GORDON  
ARCHITECTS, 2008-2012)  
Av. da Índia, 136
- 04** THE GULBENKIAN FOUNDATION  
(ALBERTO PESSOA, PEDRO CID AND RUY D'ATHOUGUIA,  
60'S)  
Av. de Berna, 45A
- 05** ISCTE, BUILDING 2 AND ICS  
(HESTINES FERREIRA, 1994)  
Av. das Forças Armadas
- 06** TERRAÇOS DE BRAGANÇA  
(ÁLVARO SIZA VIEIRA, 1998-2004)  
Rua do Alecrim
- 07** METRO STATION BAIXA/CHIADO  
(ÁLVARO SIZA VIEIRA, 1998)
- 08** MUDE  
(BÁRBARA COUTINHO AND LUÍS MIGUEL SARAIVA,  
2008-PRESENT)  
Rua Augusta, 24
- 09** CASA DOS BICOS  
(1523)  
Rua dos Bacalhoeiros
- 10** ORIENTE STATION  
(SANTIAGO CALATRAVA, 1994)  
Av. Dom João II
- 11** PAVILION OF KNOWLEDGE  
(CARRILHO DA GRAÇA, 1998)  
Alameda dos Oceanos
- 12** PORTUGAL'S PAVILION  
(ÁLVARO SIZA VIEIRA, 1998)  
Alameda dos Oceanos
- 01** BELÉM TOWER  
(1515-1519)  
Av. Brasília, Belém
- 02** MONASTERY OF JERÓNIMOS  
(1517-1601)  
Praça do Império, Belém
- 03** MONUMENT OF THE DISCOVERIES  
(COTTINELLI TELMO AND LEOPOLDO DE ALMEIDA 1960)  
Av. Brasília, Belém
- 04** ELECTRICITY MUSEUM  
(1908-1951)  
Av. Brasília, Belém
- 05** ROSSIO'S TRAIN STATION  
(JOSÉ LUÍS MONTEIRO, 1886-1891)  
Rua 1<sup>ª</sup> de Dezembro
- 06** ST. JUSTA ELEVATOR  
(RAOUL MESNIER DU PONSARD, 1898-1902)  
Rua do Ouro
- 07** TERREIRO DO PAÇO  
(16TH CENTURY)  
Praça do Comércio
- 08** LISBON'S CATHEDRAL  
Largo da Sé
- 09** CASTELO DE S.JORGE  
R. de Santa Cruz do Castelo
- 01** LX FACTORY  
(bars, restaurants, library)  
Rua Rodrigues Faria, 103, Library
- 02** PARK  
(rooftop bar)  
Calçada do Combro, 58 (parking building)
- 03** MIRADOURO DE STA. CATARINA  
A.K.A. O ADAMASTOR  
(viewpoint)  
R. de Santa de Catarina
- 04** MERCADO DA RIBEIRA  
(market, restaurants, bars)  
Av. 24 de Julho
- 05** LOST IN  
(bar)  
Rua D Pedro V, 56
- 06** BAIRRO ALTO  
(neighbourhood - bars, restaurants)
- 07** MIRADOURO S. PEDRO DE ALCÂNTARA  
(viewpoint)  
R. São Pedro de Alcântara
- 08** CAIS DO SODRÉ  
(neighbourhood - bars, restaurants, club)
- 09** MIRADOURO DO TOUREL  
(viewpoint and garden)  
R. de Júlio de Andrade
- 10** RIBEIRA DAS NAUS  
(viewpoint, riverpath)  
Av. Ribeira das Naus
- 11** TOPO  
(rooftop bar)  
Commercial Center Martim Moniz (6th floor), Praça  
Martim Moniz
- 12** MIRADOURO DA GRAÇA  
(viewpoint)  
R. de São Mamede

## WHERE TO GO AND WHAT TO

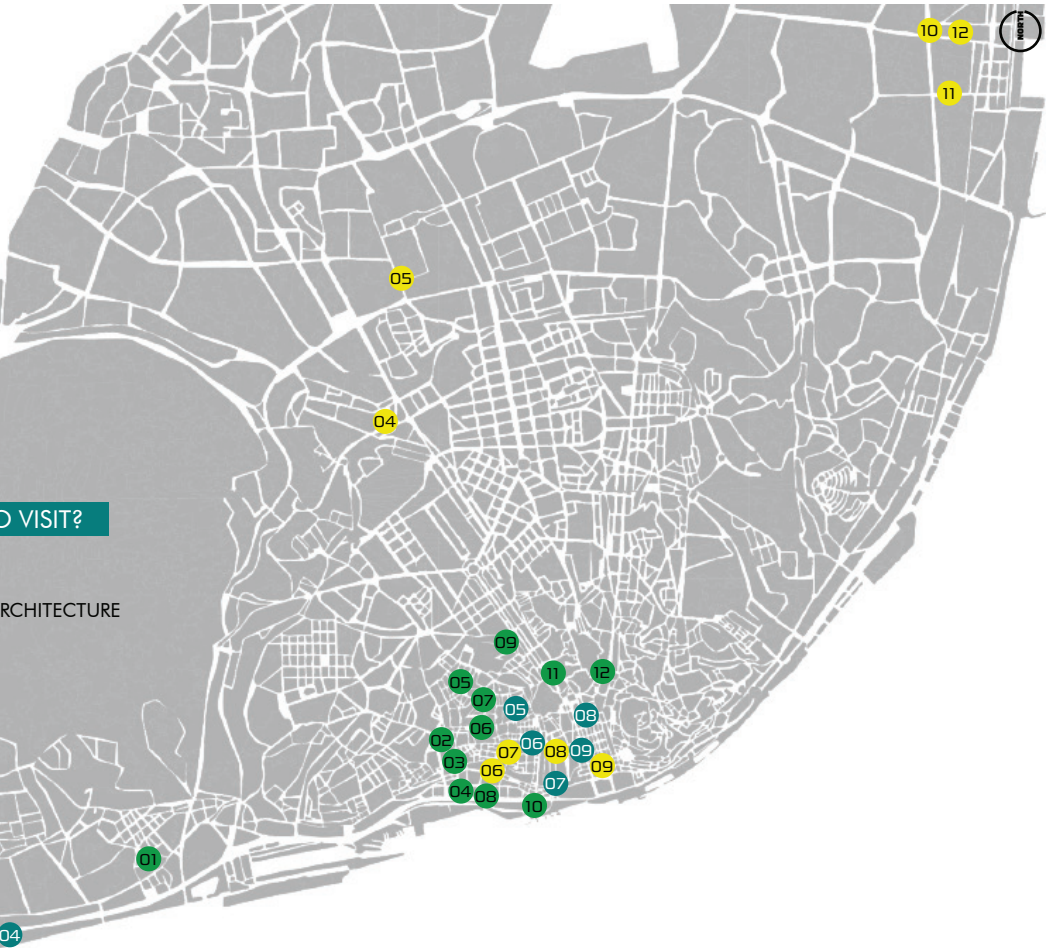
- HISTORICAL BUILDINGS
- MODERN AND CONTEMPORARY A
- VIEWPOINTS, BARS, RESTAURANTS





# 5<sup>th</sup> International Symposium Formal Methods in Architecture

May 12<sup>th</sup>–15<sup>th</sup> 2020, ISCTE-IUL, LISBON, PORTUGAL



**More Info at**

<http://www.archformalmethods.eu/>