5th International Symposium
Formal Methods in Architecture
October 15th-16th 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 López
Maria 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

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<td><strong>13:30 - 15:00</strong></td>
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<td><strong>Reinhard Goether</strong> (MIT)</td>
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## Book of Abstracts

Handle: [http://hdl.handle.net/10071/19842](http://hdl.handle.net/10071/19842)

Free Download
October 15th - 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 Luísa 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 15th - 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 Italo Guedes, Max Andrade and Adriana Carvalho
19:00 - 19:30 Discussion
   Moderator: Maria João de Oliveira
October 16th - sessions Map

**session 05**


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

01. CHAMPALIMAUD FOUNDATION - CENTER FOR THE UNKNOWN (CHARLES CORREA, 2010)  
Av. Brasília, Belém

02. BELEM CULTURAL CENTER (VITTORIO GREGOTTI AND MANUEL SALGADO, 1983-93)  
Praca 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 (HESTNES FERREIRA, 1994)  
Av. das Forças Armadas

06. TERRAÇOS DE BRAGANÇA (ADIVARO SIZA VIEIRA, 1998-2004)  
Rua do Alecrim

07. METRO STATION BAIXA/CHIADO (ADIVARO SIZA VIEIRA, 1998)  
Av. da Índia, 136

08. MUDE (BÁRBARA COUTINHO AND LUÍS MIGUEL SARAIVA, 2008-PRESENT)  
Rua Augusto, 24

09. CASA DOS BICOS ([1523]  
Rua dos Bocálhоеiros

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 (ADIVARO SIZA VIEIRA, 1998)  
Alameda dos Oceanos

13. BELEM TOWER (1515-1519)  
Av. Brasília, Belém

14. MONASTERY OF JERÓNIMOS ([1517-1601])  
Praca do Império, Belém

15. MONUMENT OF THE DISCOVERIES (COTTINELLI TELMO AND LEOPOLDO DE ALMEIDA 1960)  
Av. Brasília, Belém

16. ELECTRICITY MUSEUM (1908-1951)  
Av. Brasília, Belém

17. ROSSIO'S TRAIN STATION (JOSÉ LUIS MONTEIRO, 1886-1891)  
Rua 1º de Dezembro

18. ST. JUSTA ELEVATOR (RAOUL MESNIER DU PONSARD, 1898-1902)  
Rua do Ouro

19. TERREIRO DO PAÇO (16TH CENTURY)  
Praca do Comércio

20. LISBON'S CATHEDRAL  
Largo da Sé

21. CASTELO DE S.JORGE  
R. de Santa Cruz do Castelo

22. LX FACTORY (bars, restaurants, library)  
Rua Rodrigues Pinto, 103, Library

23. PARK (roof top bar)  
Calçada do Comblo, 58 (parking building)

24. MIRADOURO DE STA. CATARINA A.K.A. O ADAMASTOR (viewpoint)  
R. de Santa de Catarina

25. MERCADO DA RIBEIRA (market, restaurants, bars)  
Av. 24 de Julho

26. LOST IN (bar)  
Rua D Pedro V, 56

27. BAIRRO ALTO (neighbourhood - bars, restaurants)  

28. MIRADOURO S. PEDRO DE ALCÂNTARA (viewpoint)  
R. São Pedro de Alcântara

29. CAIS DO SODRÉ (neighbourhood - bars, restaurants, club)  

30. MIRADOURO DO TOUREL (viewpoint and garden)  
R. de Júlio de Andrade

31. RIBEIRA DAS NAUS (viewpoint, river path)  
Av. Ribeira das Naus

32. TOPO (roof top bar)  
Commercial Centers Martin Moniz (6th floor), Praca Martin Moniz

33. MIRADOURO DA GRAÇA (viewpoint)  
R. de São Mamede

WHERE TO GO AND WHAT TO VISIT?
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