Parametric Design of Street Profiles

Rui de Klerk¹, José Nuno Beirão²
¹,²Faculty of Architecture, University of Lisbon
¹,²{ruideklerk|jnb}@fa.ulisboa.pt

OBJECTIVES
The main objective of this workshop will be to present the CIM-St tool (Klerk and Beirão 2017) to the academic CAAD community, frame it within the CityMaker toolset and parametric urban design methodologies and gather user feedback to support further development of the tool. Another objective is to promote parametric design methodologies among the participants, providing them with the necessary tools to achieve that.

SCOPE
The workshop will be directed to both architects and urban designers but is open to any willing participant.

CONTRIBUTION TO THE CONFERENCE
In this workshop, we will present and experiment with CIM-St tool for parametric street profile design. The workshop will provide a practical and pragmatic complement to the corresponding paper presentation during eCAADe 2017. Participants will ‘dig deeper’ into the inner workings of this parametric design tool, which associates semantics with a generative design system, and experience with an alternative and expedite method to design street profiles.

EXPECTED OUTCOMES OR SKILLS ACQUIRED BY THE PARTICIPANTS
Participants will learn parametric methodologies applied to urban design, more specifically, to the design of street cross sections. They will also learn how to quickly create these designs with the aid of CIM-St, supported by real time analysis of the proposals. After this workshop, participants are expected to be able to use CIM-St without difficulties and generate qualified designs in an expeditious fashion.

WORKSHOP SIZE
Half day (4 hours).

SCHEDULE
The workshop will start with an overview of the CIM-St parametric design system and its interface, framing it within the CityMaker toolset (Beirão 2012) and parametric urban design methodologies; Users will be given an urban design problem, requiring them to propose street profile design solutions for a given area based on a set of constraints. This will require them to become familiar with CIM-St’s interface and experiment with it extensively; After the design stage, participants will be asked to complete a questionnaire regarding the usability of the design system; The workshop will close with a debate among participants, where they are expected to share their design proposals for the area and argument in their favour, with the support of CIM-St’s real time visual analytics. Besides a comparison between designs, the debate will also focus on the methodologies and tools used to accomplish them, straining their advantages and disadvantages.

PREREQUISITE SKILLS OF PARTICIPANTS
There are no prerequisite skills of the participants to participate in this workshop. Participants are required to bring their laptops and should have already installed a working version of Rhino 5 (1) with Grasshopper 3D (2).
LOGISTIC AND TECHNICAL REQUIREMENTS
In terms of space, the workshop requires enough room to comfortably accommodate all participants while using their laptops (with access to energy supply). We will also require internet connectivity for everyone and one projector + canvas.

MAXIMUM NUMBER OF PARTICIPANTS
25

BIOGRAPHIES
José Nuno Beirão
José Nuno Beirão is Assistant Professor at the Faculdade de Arquitectura, Universidade de Lisboa - FAUL-Architecture Department. He graduated in architecture from the Faculty of Architecture of the Technical University of Lisbon in 1989. Practiced architecture and urban design since then starting the architectural firm B Quadrado Arquitectos with Miguel S. Braz in 1998. José Nuno Beirão concluded his Master's degree in Urban Design in 2005 at ISCTE and his Ph.D. dissertation entitled ‘CityMaker: Designing Grammars for Urban Design’ at the TU Delft Faculty of Architecture in 2012. He developed a method and a set of tools to generate alternative solutions for different urban contexts by combining design patterns encoding typical design moves by means of shape grammars. The integrated set of tools, involving analytical, generative and assessment tools have been argued to constitute the basis of the concept of city information modelling whose acronym CIM can be read in the title, CityMaker.

His research interests are involved in the development of customizable and flexible design systems, focused on housing since 1998 and more intensively on urban design since 2001. His current interests are focused on the development of shape grammars for urban design and on the use of the generative capabilities of shape grammars to support the urban design process and foster design exploration. He is presently Co-Coordinator of the research project ‘Measuring Urbanity’, hosted by CIAUD. He is responsible for the Parametric Urban Design chair integrated in the Advanced Studies on Computation for Architecture, Urbanism, and Design at the Faculdade de Arquitectura, Universidade de Lisboa.

Rui de Klerk
Rui de Klerk holds a MSc degree in Architecture from the Faculty of Architecture, University of Lisbon (FAUL) since 2012 and is currently a PhD Candidate in Design and Computation applied to Architecture at the same Faculty, with a research on Semantic Design Systems with a FCT Doctoral Grant (SFRH/BD/131386/2017). From June 2016 until September 2017, he was a Research Fellow at the Research Centre for Architecture, Urbanism and Design (CIAUD) at FAUL, integrating the research project “Measuring Urbanity: densities and urban performance of extensive urban fabrics. The Portuguese case” (CIAUD_BI_09/ EAT/04008), with an FCT/MEC grant. From April 2015 to May 2016 he integrated the research project “TECTON 3D - Digital Mockup: Touching the 3rd dimension” (PTDC/EEI-SII/3154/2012) with an FCT grant, working on the development of an application for procedural modelling in immersive virtual reality environments. During 2013, he worked as a research intern in the project “O Lugar da Villa Renascentista na Arquitectura Portuguesa” coordinated by Professor Amílcar de Gil e Pires (FAUL).

REFERENCES
[1] https://www.rhino3d.com/edu