Judyta Cichocka
Wroclaw University of Technology, founder of Parametric Support

Judyta is a researcher in the field of architectural design optimization. She is the founder of Code of Space, a PhD candidate at Wroclaw University of Technology, the main partner of Absolute Joint System in Poland and was a parametric design tutor at Victoria University of Wellington and at Advances of Architectural Geometry in London (2014) and Zürich (2016). Judyta also co-authored Silvereye, an optimization tool based on Swarm Intelligence. She published several papers on optimization and parametric design.

Thomas Wortmann
### Advanced Architecture Laboratory, Singapore University of Technology and Design

Thomas is a PhD candidate and studio instructor in SUTD's Architecture and Sustainable Design pillar. In 2013, he graduated from MIT with a Master of Science in Design and Computation, after having worked for several years as a project architect for the Dutch architectural practice of NOX, known for its pioneering use of digital design tools. His research interest is the integration of computers into the architectural design process, with a focus on model-based optimization tools. He is the developer of Opossum, a model-based optimization tool for Grasshopper. In 2015, Thomas was responsible for designing and automatically generating cut sheets and assembly instructions for over 10.000 individual panels for the "Future of Us" grid shell in Singapore. Since 2014, he has taught design studios and parametric design courses at various universities and other institutions in Singapore. In 2016, he led an architectural optimization workshop during the Advances in Architectural Geometry Conference at ETH Zurich, entitled "Optimize this!".

Adrian Krężlik
School of Form, founder of Parametric Support

Adrian is a practicing architect with six years of postgraduate experience. The founder and the owner of Architektura Parametryczna – the biggest Polish consultancy company in parametric design. He worked on large scale projects in China, USA and Saudi Arabia for the most innovative companies: Zaha Hadid Architects in London, FR-EE Fernando Romero and Rojkind Arquitectos in Mexico. In his work, he focuses on applying digital strategies in design and construction processes. He is an active player across the parametric scene.
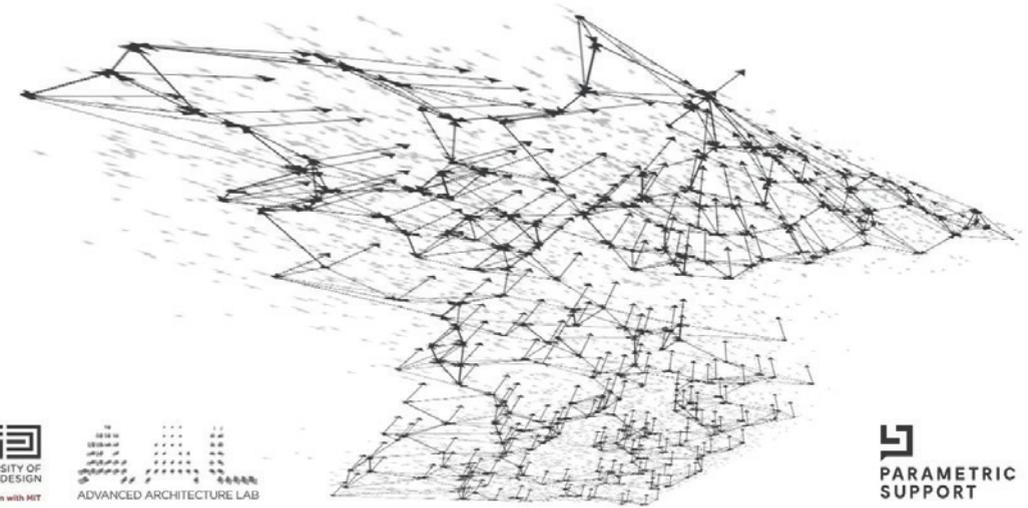
INTERFACING ARCHITECTURE, ENGINEERING AND MATHEMATICAL OPTIMIZATION
Judyta Cichocka , Thomas Wortmann, Adrian Krężlik

September 22nd - 24th, 2017
Rhinoceros, Grasshopper, Karamba

The masterclass explores applications of mathematical optimization to architectural design. Participants will learn about major classes of black-box optimization algorithms – Metaheuristics (including Swarm Intelligence), Direct Search and Surrogate Model-based Optimization – and experiment with algorithms from each category: Genetic Algorithms, Particle Swarm Optimization, DIRECT, and optimization with Radial Basis Functions.

Participants will use state-of-the-art optimization tools in Grasshopper and test them on benchmark problems. In a second step, they will develop customized optimization objectives, such as structural or environmental performance, and apply them to a predefined parametric geometry. Participants also are encouraged to bring optimization problems from their own practices and research to the workshop.

The objective of this workshop is to provide participants with both the conceptual background and technical skills required to integrate optimization into their architectural practice and research. The masterclass will yield benchmark results for the test problems and provide examples of how different formulations of optimization objectives can inform conceptual architectural design process.