

Robert K. Otani
Principal | CORE Studio

Robert Otani has 20 years of professional experience, including structural design, project management, advanced computational design and modeling. His portfolio includes a variety of sports, commercial high-rise, infrastructure, aviation and cultural projects, as well as structural art. He also has extensive experience designing and detailing architecturally exposed structural steel and concrete structures.

Daniel Segraves
Senior Computational Designer | CORE Studio

Daniel Segraves works closely on tool development and research projects. He is a specialist in advanced modeling and computational design strategies, with expertise spanning a wide spectrum from architectural systems optimization to urban energy modeling. His work is widely published and he lectures frequently throughout the AEC community. Daniel's background is in the design side of the field- before coming to Thornton Tomasetti he worked as a computational design specialist for OMA, SOM, Adrian Smith + Gordon Gill, Gensler and others. He holds a BArch from the Rhode Island School of Design, and an MArch from the Architectural Association of London.

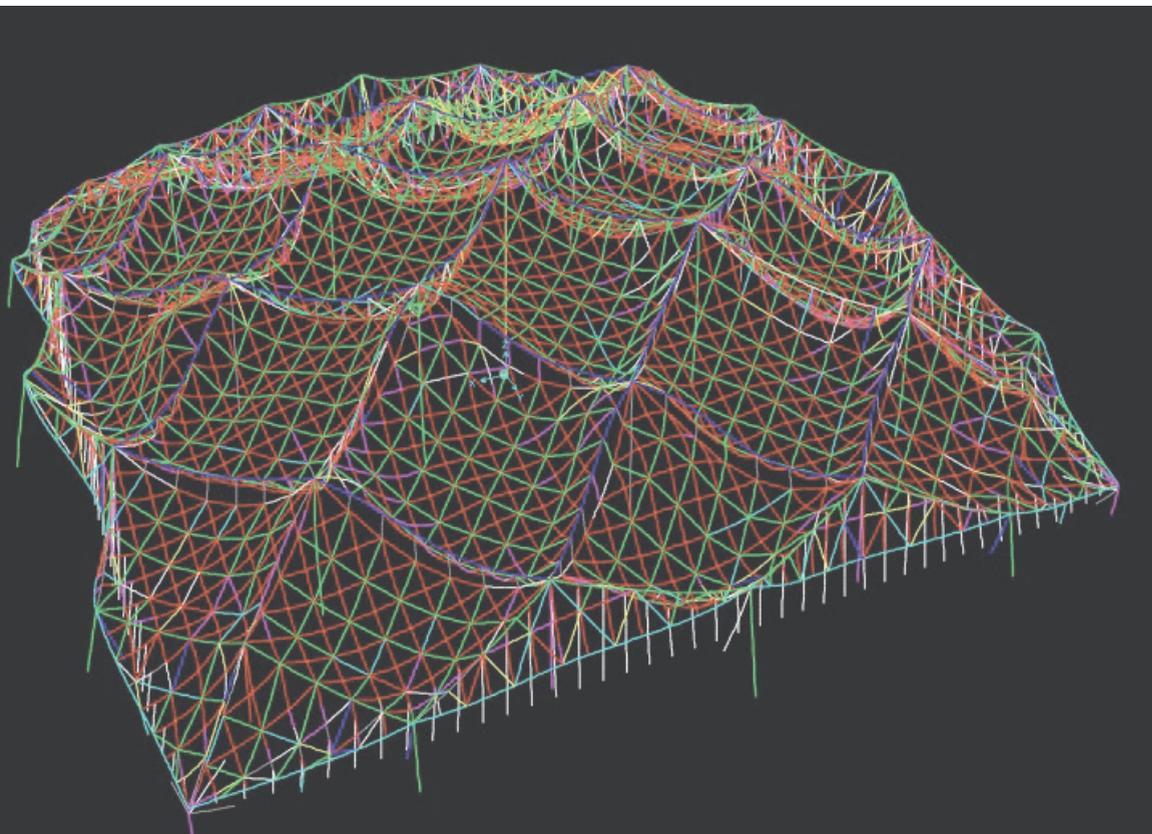


PARAMETRIC MODELING AND OPTIMISATION OF COMPLEX STRUCTURAL SYSTEMS

Robert K. Otani, Daniel Segraves

September 22nd - 24th, 2017

Rhinoceros, Grasshopper, Karamba (alternatively: Dynamo, SAP)



This master class will cover essential strategies for setting up a framework to carry out structural optimisation of complex systems.

The first step in this process involves defining flexible parametric relationships, with variables in mind for later design manipulation. We will cover a number of techniques for intelligent modeling set-up of typically complex tasks such as irregular space-frame, truss, and shell forms. The course would also cover principles of optimisation for many typologies, such as shell, plate, arch, catenary, etc.

The next step requires an analysis workflow - assigning structural properties (loads, fixities, materials) and establishing a two-way exchange between a parametric modeling environment and a structural analysis platform. We would propose GH - Karamba because it is the most common and easily accessible, but could also accommodate a Dynamo - SAP or GH - SAP workflow if IASS thinks any of these will be more popular or participants have specific needs.

The final step, the optimisation, would investigate both 'material' optimisations (section sizes, thicknesses, topology) and 'geometric' optimisation - pattern, angles, locations, etc. We will cover different stochastic engines, easily designed iterative processes, and the potential for machine learning application.

Following these tutorials we would propose a full day devoted to project exploration | the design of a custom process by individuals or teams. This allows for a sort of hackathon where participants can invent a unique process for their own specifically defined problem - potentially a problem they have or expect to encounter.