

Robot Made: Large-Scale Robotic Timber Fabrication in Architecture

Lecture and Workshop

Research Associate Oliver David Krieg of the *Institute for Computational Design and Construction* (ICD), and Assistant Professor David Correa from University of Waterloo will hold a workshop on robotic fabrication at the *Centre for Advanced Wood Processing of the University of British Columbia, Vancouver*, from September 9th to 13th, divided into two parts.

Using a state of the art eight axis industrial robot configuration, the workshop will guide participants through the unique technical and conceptual foundations that underpin robotic milling in wood through the development of a full-scale fabrication project.

The Workshop

The workshop is structured as a two full-day intensive training with the robot on the weekend, followed by a hands-on fabrication session the following three days:

Part I: Robot Training (9.9 – 10.9.)

The two full-day training sessions will cover an introduction to the computational design tools used during the workshop, robot operation, controls, and safety procedures.

Part II: Fabrication / Prototyping (11.9. – 13.9.)

Participants will directly engage in the design and fabrication process by starting with a base geometry during the design phase, generating a buildable structure using computational design tools in feedback to the machine's constraints. Participants will take control of the robot and assist in the prefabrication of an architectural prototype made from large timber elements. The prototype will then be assembled and set up on campus.



Workshop Proposal: Self-stabilizing timber frame construction through the combination of pre-fabricated elements and off-the-shelf façade planks.



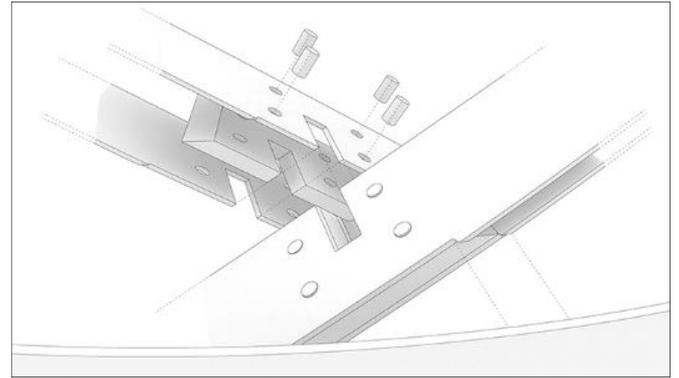
Robotic fabrication setup, Centre for Advanced Wood Processing at the University of British Columbia.

The Prototype:

By using advanced timber fabrication techniques and taking full advantage of the extended fabrication range of the multi-axis set up, large sections of plywood will be custom milled and assembled on-site into a unique one-to-one scale architectural prototype. The prefabricated elements will serve as a sub-structure for off-the-self façade planks. Once assembled, they form a stable, doubly-curved building system. The prototype will showcase distinctive wood fabrication possibilities that integrate computational design, material characteristics, and digital fabrication in a direct design to production paradigm.

Oliver David Krieg is a research associate, doctoral candidate and instructor at the Institute for Computational Design (ICD) at the University of Stuttgart. With a profound interest in computational design processes and digital fabrication in architecture, he participated in several award winning and internationally published projects. In the context of computational design, his research aims to investigate the architectural potentials of robotic fabrication in wood construction. Oliver David Krieg has taught several fabrication workshops, and has given lectures at national and international conferences in architectural design and timber construction. For the duration of his dissertation he is also a scholarship holder of the German National Academic Foundation.

David Correa is Assistant Professor at the University of Waterloo and co-founder of the ILLab interdisciplinary design practice based in Shanghai. At the ICD, David Correa initiated and lead the research field of Bio-inspired 3D Printed Programmable Material Systems where he is currently completing his Doctoral Studies. His research investigates the reciprocal relationship between material design and fabrication from a multi-scalar perspective. With a critical focus on climate responsive materials for the built environment, the research couples computational tools, simulation and digital fabrication with bio-inspired design strategies for material architectures.



Exploded detail of the workshop proposal. The support structure will be robotically milled and combined with standardized façade planks for stability.



Last year's workshop result was built using the same computational design and fabrication processes.

The workshop is supported by:

*School of Architecture and Landscape Architecture
Centre for Advanced Wood Processing (CAWP)
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Information and Registration

Registration Fees: Regular: \$595

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