

Robot Made: Large-Scale Robotic Timber Fabrication in Architecture

Lecture and Workshop

Oliver David Krieg, Director of Technology at LWPAC, David Correa, Assistant Professor at the University of Waterloo, and AnnaLisa Meyboom, Associate Professor at UBC will hold a workshop on robotic fabrication at the *Centre for Advanced Wood Processing of the University of British Columbia, Vancouver.*

Using a state of the art seven 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 one full-day intensive in class session on Saturday with robot orientation, followed by a parametric design and fabrication session on Sunday and then hands-on fabrication session the following three days. Participants can opt for the full program or the shortened program:

Part I: Robotic Fabrication Seminar and Robot Training (13.10) (one-day program)

The one day training session will cover an overview of state-of-the-art robotic fabrication in timber, introduction to the computational design tools used during the workshop, and introduction to robot operation.

Part II: Fabrication / Prototyping (14.10 – 17.10.) (five-day program)

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.



2016 - Robot Made Workshop prototype: Double-Layered Elastic Bending for Large Scale Folded Plate Structures



2017 - Robot Made Workshop prototype: Double-Layered Diagrid Facade Structure



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

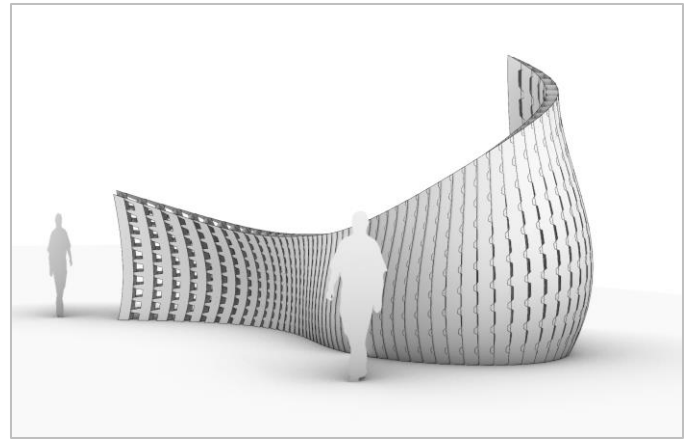
The Prototype:

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 an expert in computational design and digital fabrication in architecture. His work is characterized by a focus on integrative processes and close collaborations between engineering, material science, sustainability analysis, building physics, and fabrication. As Director of Technology at LWPAC in Vancouver, and doctoral candidate at the Institute for Computational Design and Construction at the University of Stuttgart, his work aims to employ the reciprocities between technology and material characteristics in order to rethink how architecture will be designed, fabricated, and constructed in the future.

David Correa is Assistant Professor at the University of Waterloo and co-founder of the IILab interdisciplinary design practice based in Shanghai. David Correa's research looks at biological structures and processes as a source of insight for the development of new fabrication processes and advanced materials. The research aims at implementing state of the art digital fabrication tools (robotic manipulators, 3D printers and CNC milling) to develop innovative and high-performance design solutions for industrial and architectural applications.

AnnaLisa Meyboom is an Associate Professor at the School of Architecture and Landscape Architecture at the University of British Columbia. Her area of expertise is the integrated design of engineering and architecture. She holds a degree in engineering from the University of Waterloo and a degree in architecture from the University of British Columbia. Her research looks at the influence of disruptive technologies on our built form at the building and the urban scale. She makes informed speculations on future outcomes which clarify decisions that society needs to make about technology and how it is used.



Workshop Proposal: Robotically fabricated self-stabilizing timber frame structure.

The workshop is supported by:

Forestry Innovation Investment

*School of Architecture and Landscape Architecture
Centre for Advanced Wood Processing (CAWP)
University of British Columbia*

Information and Registration

Registration Fees:

Part I - Regular: \$195

Part I & Part II - Regular: \$595

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