Public PhD-defence 10.12.2020

Tom Svilans defends the dissertation
Integrated material practice in free-form timber structures
The defence takes place Thursday 10th of December 2020, at 16:30 in Zoom https://kadk.zoom.us/j/61793933367

Royal Danish Academy

Architecture
Design
Conservation

Agenda

16:30	Welcome and presentation of chairperson, Assessment Committee, supervisors and author
16:35	Tom Svilans presents his dissertation Integrated material practice in free-form timber structures
17:20	Short break According to the 'Ministerial Order on the PhD Course of Study and the PhD Degree' the chairperson may invite the audience to contribute with short statements. Such intentions should be addressed to the chairperson during the break.
17:30	Billie Faircloth, Partner Kieran Timberlake, US. Adjunct Professor, Weitzman School of Design, University of Pennsylvania, USA
18:00	Niels Martin Larsen, Cand. Arch., PhD Associate Professor, Aarhus School of Architecture
18:30	Olga Popovic Larsen, Professor, Institute of Architecture and Technology, The Royal Danish Academy – Architecture, Design, Conservation, Copenhagen, Denmark (Chair of the Assessment Committee)
19:00	Comments from the auditorium The Assessment Committee evaluates and makes the concluding remarks Closure of session

Assessment committee

Billie Faircloth	Partner Kieran Timberlake, US. Adjunct Professor, Weitzman School of Design, University of Pennsylvania, USA
Niels Martin Larsen	Cand. Arch., PhD Associate Professor, Aarhus School of Architecture
Olga Popovic Larsen	Professor, Institute of Architecture and Technology, The Royal Danish Academy – Architecture, Design, Conservation, Copenhagen, Denmark (Chair of the Assessment Committee)

Principal Supervisor

Mette Ramsgaard Thomsen	Professor, Institute of Architecture and Technology, The Royal Danish Academy – Architecture, Design, Conservation, Copenhagen, Denmark (Chairperson of the defence)

The thesis is available to look through for interested persons at the Library of Architecture, Design and Performing Arts, Danneskiold-Samsøes Allé 50, 1434 Copenhagen K.
The electronic thesis is available to look through for interested via this link:

Secondary supervisor

Martin Tamke	Associate Professor, The Royal Danish Academy – Architecture, Design, Conservation, Copenhagen, Denmark

Company supervisors

Martin Antemann	Project Development / Sales, Design-to-Production GmbH, Switzerland
Kai Strehlke	Head of Digital Processes, Blumer Lehmann AG, Switzerland
Jonas Runberger	Architect PhD, Director of Dsearch, Digital Design Development at White Arkitekter, Sweden

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Abstract

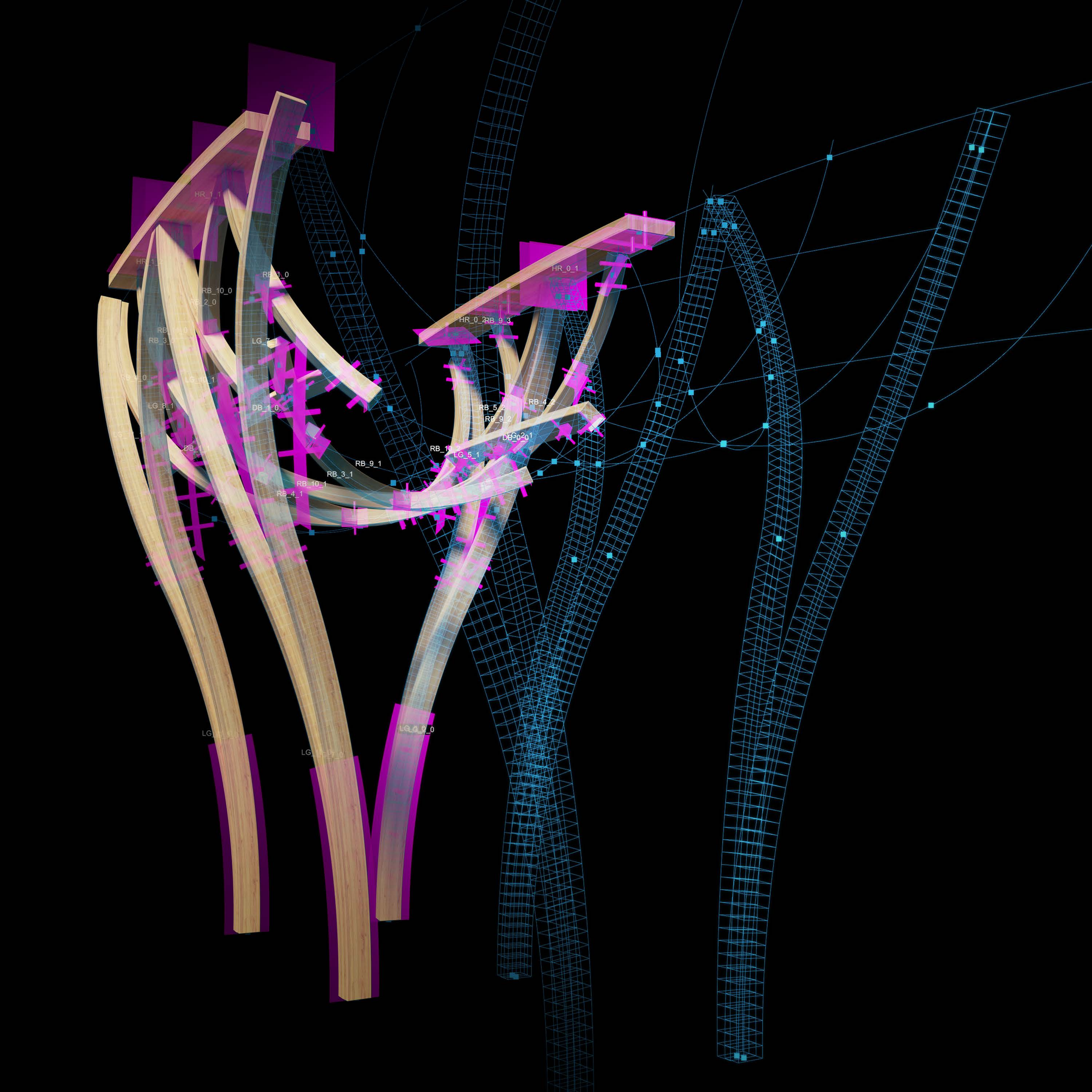
The advent of digital tools and computation has shifted the focus of many material practices from the shaping of material to the shaping of information. The ability to process large amounts of data quickly has made computation commonplace in the design and manufacture of buildings, especially in iterative digital design workflows. The simulation of material performance and the shift from models as representational tools to functional ones has opened up new methods of working between digital model and physical material.

Wood has gained a new relevance in contemporary construction because it is sustainable, renewable, and stores carbon. In light of the climate crisis and concerns about overpopulation, and coupled with developments in adhesives and process technology, it is returning to the forefront of construction. However, as a grown and heterogeneous material, its properties and behaviors nevertheless present barriers to its utilization in architecturally demanding areas. Similarly, the integration of the properties, material behaviors, and production constraints of glue-laminated timber (glulam) assemblies into early-stage architectural design workflows remains a challenging specialist and inter-disciplinary affair.

Drawing on a partnership with Dsearch – the digital research network at White Arkitekter in Sweden – and Blumer Lehmann AG – a leading Swiss timber contractor – this research examines the design and fabrication of glue-laminated timber structures and seeks a means to link industrial timber fabrication with early-stage architectural design through the application of computational modelling, design, and an interrogation of established timber production processes. A particular focus is placed on large-scale free-form glulam structures due to their high performance demands and the challenge of exploiting the bending properties of timber. By proposing a computationally-augmented material practice in which design intent is informed by material and fabrication constraints, the research aims to discover new potentials in timber architecture.

The central figure in the research is the glulam blank - the glue-laminated near-net shape of large-scale timber components. The design space that the blank occupies - between sawn, graded lumber and the finished architectural component - holds the potential to yield new types of timber components and new structural morphologies. Engaging with this space therefore requires new interfaces for design modelling and production that take into account the affordances of timber and timber processing.

The contribution of this research is a framework for a material practice that integrates processes of computational modelling, architectural design, and timber fabrication and acts as a broker between domains of architectural design and industrial timber production. The research identifies four different notions of feedback that allow this material practice to form.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