

PHD SCHOLARSHIP

The University of Queensland (Brisbane, Australia) is offering a PhD scholarship for a motivated student to contribute to research being undertaken in the *Centre for Future Timber Structures* (CFTS). The scholarship will be for up to 3.5 years and valued at \$26,682 AUD per year, indexed annually. Top-up scholarships and international student fee-waivers are also available to exceptional candidates.

PROJECT INFORMATION

Prefabrication and Digital Fabrication Strategies for Large-Scale Timber Construction

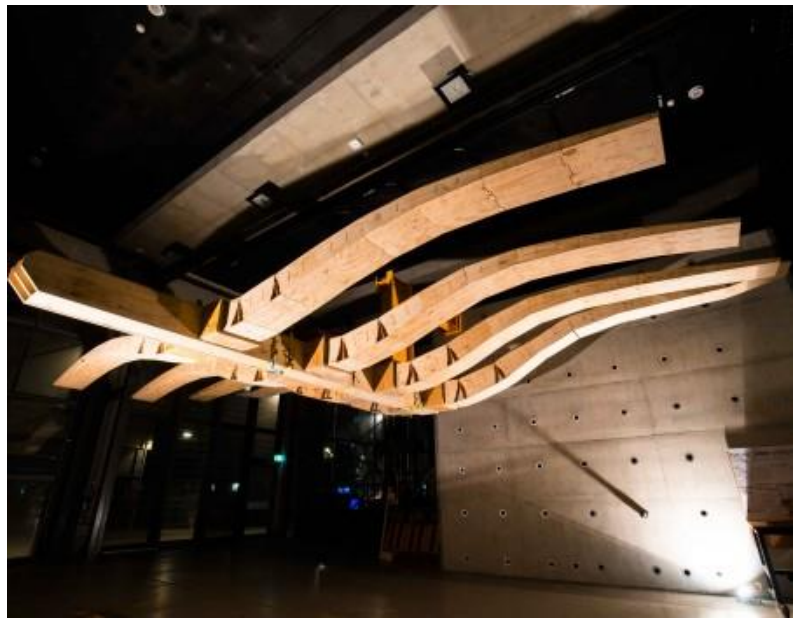
Digital fabrication gives designers a greater role in building component production and allows them to realise intricate, customized, and beneficial structural systems with performance and constructability benefits. The intersection of prefabrication and digital fabrication technologies have allowed for the delivery of several recent and highly innovative mass timber structures such as the Tamedia Office Building, Nine Bridges Country Club, etc. Key benefits include the greater use of timber in the overall building system and beneficial building assembly behaviors that arise from the higher degree of coordination that exists between designer, fabricator, and builder. Prefabrication and manufacturing automation technologies also give builders and manufacturers extreme building and component precision with reduced cost and time. As a result, these technologies are increasingly relevant in the design and construction industries and offer many opportunities for skilled designers

This project proposes to investigate the combination of manufacturing automation and digital fabrication skillsets to create timber joints and systems which have more intelligence and construction efficiencies as compared with current proprietary timber construction systems. Of particular focus is development of assembly methods that extend current post-and-beam and panellised tall timber construction systems. Project development is to include three stages: design and prototyping of new digitally-fabricated systems; assessment of systems for market, manufacturing, performance, and construction feasibility; and testing and analysis of feasible technologies towards full-scale utilisation.

Resources and Facilities at the Centre for Future Timber Structures

The PhD candidate will be supervised by Kim Baber from the School of Architecture and Joe Gattas from the School of Civil Engineering, to give an interdisciplinary perspective across architecture, structural engineering, and computational design. Kim Baber is a registered practicing architect, Principal of Baber Studio, and in 2015 was awarded the Queensland Emerging Architect Prize awarded by the Australian Institute of Architects. He is a Fellow at the University of Queensland and for the past 10 years has led a number of research investigations in timber design and digital fabrication. Dr Joe Gattas leads the Folded Structures Lab, a research group working on parametric geometry, sheet material fabrication methods, and applications to engineering and architecture. The PhD candidate will also have access to a range of academic and industry professionals through the CFTS, including experts in timber product development and prefabricated construction.

To realise the project goals, the PhD candidate will have access to state-of-the-art facilities at the University of Queensland. These include: the Structural Engineering Laboratory for full-scale structural testing (includes a strong floor, reaction wall, and \$1.5m of actuation and data logging systems); the Digital Fabrication Laboratory for full-scale manufacture (includes a 1.5m x 3m 5-axis waterjet cutter and two Kuka Robot Arms), and the Architecture Co-Lab for timber and rapid prototyping (includes a full timber workshop and design space). Candidates will also have optional access to facilities of partners of the Centre for Future Timber Structures, including CNC facilities for mass timber construction at Hyne Timber and wood product manufacturing facilities at the Queensland Government Salisbury Research Facility.



Past projects Top row: Fish Lane Follies exhibition (left) and a bending-stabilised structure built for CFTS Official Opening (right). **Facilities** Bottom row: in-progress construction of projects in the School of Architecture Co-Lab (left) and the Structures/Digital Fabrication Lab (right).

QUALIFICATIONS

Candidates must hold a relevant undergraduate degree in architecture, engineering, or mathematics. Candidates with skills or interest in parametric design, digital fabrication, structural geometry, or timber construction are strongly encouraged to apply.

HOW TO APPLY

Interested candidates should submit their scholarship application on the Application For school-based PhD or MPhil scholarship [form](#), together with your supporting documents on the [HDR online application system](#).

Details on the application for admission and scholarship process can be found at <http://www.uq.edu.au/grad-school/how-to-apply>. For further details on the scholarship project, please contact Kim Baber at k.baber@uq.edu.au or Joe Gattas at j.gattas@uq.edu.au.

Submission for RQ4 (October 2017) commencement due by **31st July 2017**.
Submission for RQ1 (January 2018) commencement due by **31st October 2017**.