CURRICULUM VITAE

Shaun, Dai Syuan Wu

Project Leader in Digital Construction
Specialist in Computational Design and 3D Concrete Printing Structure
Project Portfolio: https://shaunwu25.github.io/

Profile

Shaun Wu graduated from ETH Zürich, Switzerland, with a specialisation in Digital Fabrication and Computational Design. Since 2018, he has been with Witteveen+Bos Singapore, working on projects involving 3D concrete printing (3DCP) structures, robotic controls, parametric design automation, and slicer software development.

As a project leader, Shaun oversees the full technical spectrum of 3D concrete printing projects, spanning design, engineering, robotic print execution, QA/QC, software development, and overall project management.

He has played a key role in Singapore's national 3D Concrete Printing research initiatives aimed at enhancing construction productivity and sustainability, including the HDB "Cities of Tomorrow" 3DCP Research Project and the LTA's first load-bearing 3D-printed bridge.

At Witteveen+Bos Singapore, Shaun leads digital construction projects and business development, and is a recognised speaker in advancing 3DCP applications for bridges, housing, and sustainable construction.

Personal

Year of birth	1990
Nationality	Taiwanese, Singapore PR
Gender	Male

Career

2023 - present	Witteveen+Bos, Singapore, Project Leader in Digital Construction
2018 - 2023	Witteveen+Bos, Singapore, Computational Design Specialist
2021 - present	Building and Construction Authority (BCA), Singapore, Adjunct Lecturer in Specialist Diploma Construction Productivity
2017 - 2018	Swiss Federal Institute of Technology Zürich (ETH-Z), Switzerland, Part-time Programmer
2015 - 2016	TMA Architects Associates, Taiwan, Architectural Design Engineer
2014 - 2015	JC Architecture, Taiwan, Architectural Design Engineer
2013 - 2013	Computational Design Lab, Tamkang University, Taiwan, Full-time Researcher

Experience

2023 - present	Project Leader LTA 3D-printed Concrete Pedestrian Bridge Deck, Singapore Lead the investigation into the benefits, feasibility, and limitations of 3D Concrete Printing (3DCP) by developing Singapore's first load-bearing 3D-printed pedestrian bridge deck. Develop a parametric design process and optimisation model to determine the most efficient geometry and printing strategy for large-scale 3DCP applications.
2024 - present	Lead Design Automation Engineer European Space Agency Accelerated Investment Plan, Netherlands Develop a parametric model for design automation of a floating oval steel bridge

structure that allows large spans with prefabricated concrete hollow core slabs.

2023 - 2024 Project Leader
Development of 3DCP gantry printer with dual-bridge controls, Singapore
NTU Singapore Centre of 3D Printing acquires a large scale 3DCP gantry printer with two bridges that is able to conduct 6-axis printing and gripping system. A slicer software is developed that combines the process of printing and rebar integration in a central program. The slicer software is developed as a Grasshopper plug-in in C#.

2023 - 2025 Project Leader
Development of 3DCP 7-axis Kuka robot on track, Thailand
Supported Siam Cement Group in advancing its 3D Concrete Printing (3DCP) capabilities through the integration of an industrial 7-axis KUKA robot mounted on a linear track with automated start/stop control. Developed a customised slicer software that incorporates computational slicing strategies with KUKA robotic motion control, enabling reliable, continuous, and optimised large-format 3D printing.

2022 - 2022 Lead Robotic Software Developer
Slicer Software Engineering of 4-axis Cylindrical 3D Concrete Printer, Thailand
CNC-Design is developing two 3D-concrete printers for Siam Cement Group (SCG) in Thailand. The setup consists of a 3x3x3 m^3 and a cylindrical printer with an outer radius of 6 meters. Developed a customised Grasshopper plug-in to convert standard 3D design geometries into robot-readable formats, enabling automated toolpath generation and seamless integration with the respective robotic printing systems."

2022 - 2022 Project Design Engineer
3D Concrete Printed Pedestrian Bridges, The Netherlands
Developed and translated architectural design models into structural analysis models for finite element modelling (FEM), using parametric modelling workflows to streamline geometry processing, load case definition, and structural optimisation for 3D concrete printed bridge applications.

2021 - 2021 Project Design Engineer
NPark 3D Concrete Printing of coral reef attachment units, Singapore
Designed and 3D-printed ecological coral reef attachment units for deployment at Jurong Island. The design incorporated biomimetic features inspired by natural coral growth patterns while accounting for 3D concrete printing constraints, ensuring both structural robustness and ecological functionality

2021 - 2021 Lead Full-Stack Web Developer
Web-based product configurators for 3D Concrete Printing Designs, Singapore
Led the development of full-stack web applications that convert Grasshopper-based parametric design scripts into interactive browser-based configurators. Implemented real-time geometry computation, UI/UX design, and backend integration to allow users to customise 3D concrete printing designs directly through a common web interface.

2020 - 2020 Lead Robotic Software Developer
Software Engineering of a Mobile 4 Axis Gantry Robot for 3D Concrete Printing Operation, Thailand
Developed a Rhino-based slicer and control interface for a mobile 4-axis gantry robot enabling large-scale 3D concrete printing for Siam Cement Group.

2019 - 2020 Lead FEM Software Developer
Buckling Simulation for 3D Printing in Fresh Concrete, Singapore
Developed a numerical simulation framework to evaluate the printability of fresh concrete during layer-by-layer extrusion. The model predicts the onset of elastic buckling and plastic collapse in early-age printed elements, enabling optimisation of geometry, material parameters, and printing strategies to ensure structural stability during fabrication.

2018 - 2019 Lead Software Developer
Software Development of Topological Optimisation Algorithm for 3D Concrete Printing technology with Autodesk, Singapore
Developed a suite of computational design tools implementing density-based

topological optimisation to achieve weight-efficient, materially optimised geometries for 3D concrete printing. The software enables designers to distribute material intelligently within a defined design domain, generating structurally efficient and fabrication-aware forms suitable for large-scale additive manufacturing.

2018 - 2021 Front End Web Developer

Cloud BIM management platform as part of a Smart Integrated Construction System for Housing Development Board, Singapore

Developed the front-end components of the Integrated Building Information System (IBIS), a core module of HDB's Smart Integrated Construction System (SICS).

Implemented a WebGL-based 3D viewer to visualise IFC models directly in the browser, enabling real-time, interactive BIM exploration and digital project coordination.

2018 - 2018 Robotic Software Developer

Development of 3D Concrete Printing Facility, BESIX3D, Dubai U.A.E

Supported the establishment of a full 3D concrete printing facility for BESIX3D, including the setup of printing workflows, slicer software configuration, and on-site training.

Provided comprehensive training on slicer software usage, robotic printing operations, and end-to-end process execution for commercial 3DCP production

2018 - 2022 Project Design Engineer, Lead Robotic Software Developer

Development of 3D Concrete Printing Technology for Construction for Housing Development Board (HDB), Singapore

Led the establishment of a large-scale 3D concrete printing gantry system at the HDB Centre of Building Research, including printer setup, calibration, and workflow integration. Developed a customised slicer software tailored to HDB's construction needs and integrated existing HDB building details and design requirements into the 3DCP workflow, enabling the automation of print-ready geometry and fabrication processes.

2018 - 2018 Computational Designer

Development of Urban Furniture for 3D Concrete Printing, Singapore

Designed and produced urban furniture using a large-scale 3D concrete printing system. Utilised parametric modelling to develop complex, non-standard geometries while addressing manufacturing, material, and printability constraints from 3D concrete printing process.

2017 - 2017 Master Thesis

Computational Strategies for Design and Assembly of Thin Folded Concrete Structures, ETH-Zurich, Switzerland

Investigated computational workflows for designing and fabricating thin folded concrete structures using Smart Dynamic Casting (SDC), a digitally controlled slip-casting process. Developed algorithms for geometry optimisation, process control, and automated fabrication of non-standard concrete elements.

2017 - 2017 Master Student Project

Robotic fabrication on curved brick walls, ETH-Zurich, Switzerland

Developed and fabricated a full-scale architectural brick labyrinth using a multi-robotic gantry system. Created computational design tools to assess structural stability for dry-stacked brick geometries and to generate robotic assembly instructions for complex curved wall constructions

2017 - 2017 Master Student Project

3D metal printed pavilion

Investigated additive manufacturing workflows for metal casting by designing 200 unique structural joints produced through 3D-printed sand moulds. Created algorithmic tools for generating space-frame assemblies, integrating structural analysis and fabrication-aware constraints into the geometric design process.

2015 - 2016 Architectural Design Engineer

Design competition in catholic church, Taiwan

Developed a stained-glass façade system designed to convey religious narratives for a new Catholic church in central Taiwan. Utilised parametric modelling to convert 2D imagery into pixelised, modular stained-glass components, optimised for geometric

	constraints, constructability, and budget considerations.
2013 - 2013	Architectural Design Engineer Design and Engineering on the non-standard large doubly-curved roof, Taiwan Designed and engineered the complex doubly-curved roof structure for the Cloud Dance Theatre in Taiwan. Reconstructed and tessellated large-scale freeform surfaces into planar-quad panels suitable for fabrication. Applied parametric modelling throughout schematic and detailed design phases to ensure geometric accuracy, constructability, and efficient panelisation.

Education

2016	Swiss Federal Institute of Technology Zürich (ETH-Z), Master of Advanced Studies in Architecture and Digital Fabrication, Switzerland Master Thesis: Computational Strategies for Design and Assembly of Thin Folded Concrete Structure using Robotic Smart Dynamic Casting System
2012	Tamkang University, Bachelor of Architecture, Taiwan

Courses

2025	Witteveen+Bos, Project Management Training in Finance
2025	Witteveen+Bos, Project Management Training in Legal and Quality
2025	Witteveen+Bos, Version Control in Git
2024	McNeel Europe, Rhino.Inside.Revit
2024	Witteveen+Bos, Project Management
2023	McNeel Europe, Grasshopper Level 3
2021	McNeel Europe, Robotic Fabrication with COMPAS Framework workshop
2021	Witteveen+Bos, Project-Based Working
2021	Witteveen+Bos, Proposal Writing
2020	McNeel Europe, C# Scripting Level 3 Rhino/Grasshopper in Computational Geometry
2019	Udacity, Full-Stack Developer Course
2019	Witteveen+Bos, Technical Writing
2018	Witteveen+Bos, Revit & Dynamo Training
2018	LinkedIn, Grasshopper and Rhino: Python Scripting
2018	Udacity, Front-End Developer Course

Languages

Mandarin	Excellent
English	Excellent

Publications

2024	Advancing load-bearing applications for 3D concrete printing in practice: Insights from Witteveen+Bos. The 5th International Conference on 3D Construction Printing, City of University, Hong Kong. Shaun Wu, Shan He, Jolien Van Der Putten, Marijn Bruurs, Hans Laagland
2024	Design of 3D Concrete Printing Bridges, 3D Printing Tech Exchange, Building and Construction Authority (BCA) Academy Braddel Campus
2023	Standardization, research and testing for statutory submission for approval of 3d concrete printed structures: a comparison between Singapore and Netherlands based on the Eurocode the international Conference on 4th International Conference for Construction 3D Printing at NTU Singapore Centre of 3D Printing, pages 6, Hans Laagland, Maartje Hoogeveen, Marije Schilder, Shaun Wu, Marijn Bruurs, Jolien van der Putten
2022	Realisation of Computational Concrete Column With 3D Concrete Printing Process, International Conference On Design For 3D Printing Conference, hosted by Nanyang Technological University, Singapore Centre of 3D Printing, Presented by Marije Schilder Witteveen+Bos with the best presentation award

2021	Architecture's multi-functions, Taiwan Architecture Magazine, August 2022, vol.323, pages 80-85, Shaun Wu, Jun Su
2021	3D Concrete Printing's Applications and Challenges, Concrete Technology, January 2022, Vol.16, No.1, pages 67-73, Shaun Wu
2019	Buckling Simulation for 3D Printing in Fresh Concrete, Construction Printing Technology, CPT 4.20, pages 34 - 37, Shaun Wu

Memberships

- Working Group Member, head of the topic Printer and Fabrication, Construction Additive Manufacturing Working Group (CAMWG) organised by National Additive Manufacturing Innovation Cluster (NAMIC) and Standard Development Organisation (SDO)

Additional functions

2025

- Built Environment Sector Representative, RIE 2030 Senior Leader Roundtable – Shaping the Future of Additive Manufacturing in Singapore, hosted by National Additive Manufacturing Innovation Cluster (NAMIC)
- Lecturer, Design Automation with Parametric Modelling for European Space Agency (ESA), hosted by Witteveen+Bos Building Division
- Invited Guest Sharing, Potential 3D Concrete Printing Ideas for Infrastructure, hosted by Land and Transport Authority (LTA), Infrastructure Design & Engineering Group
- Guest Speaker, Digital Construction in 3D Concrete Printing, School of Civil Engineering, Huazhong University of Science & Tech, National University of Singapore, hosted by X-INTERVAL international academic programs

2024

- Invited Speaker, Design of 3D Concrete Printing Bridges, 3D Printing Tech Exchange, Built Environment Innovation Hub, Building and Construction Authority Academy (BCAA) Braddel Campus
- Selected Hackathon Paticipant, Parametric Steel Structure Engineering, Steel Construction Day, hosted by Bouwenmetstaal, Netherlands
- Invited Guest Sharing, Digital Construction in 3D Concrete Printing, hosted by Dutch Consulate, Construction Industry Council (CIC), Industry Development, Hong Kong
- Invited Guest Sharing, Digital Construction in 3D Concrete Printing, hosted by Dutch Consulate, Housing Authority, Hong Kong
- Invited Guest Sharing, Digital Construction in 3D Concrete Printing, hosted by Dutch Consulate, Building Department, Hong Kong

2023

- Keynote Speaker, Design for 3D Concrete Printing Technology, hosted by BuildTech Asia 2023, National Additive Manufacturing Innovation Cluster (NAMIC)
- Guest Lecturer, Design for 3D Concrete Printing Technology, hosted by National University Singapore, Master Program in Building Performance and Sustainability, Course in Advanced Building Materials and Structures

2022

- Keynote Speaker, Design for 3D Concrete Printing in DfMA Workshop, hosted by Nanyang Technological University, Singapore Centre of 3D Printing (SC3DP)
- Main Character, Singapore 3D Nation Documentary - S1E8: Building Our Tomorrow filmed by Channel News Asia (CNA)
- Keynote Speaker, 3D Concrete Printing Technology, Digital Concrete Innovation Centre Seminar, co-host by Witteveen+Bos and Housing Development Board (HDB)

2021

- Adjunct Lecturer, Advanced Construction Technology in 3D Printing. Specialist Diploma in Construction Productivity Program hosted by Building and Construction Authority (BCA) Singapore.
- Speaker, Computational Design and Digital Fabrication. Webinar, hosted by Witteveen+Bos Netherlands.
- Speaker, Webinar hosted by Karamba3D Digital Construction and Buckling Simulation for 3D Printing in Fresh Concrete