

portefølje

N I M A Z A H I R I



NIMA ZAHIRI.

Sivilingeniør, ph.d. i trekonstruksjon

Jeg er konstruktør og prosjektingeniør med spesialisering i trekonstruksjon. Min ekspertise ligger særlig i computational design, integrerte teknologier og digital fabrikasjon, drevet av stor lidenskap for bærekraftige og innovative løsninger.

Profil [LinkedIn](#) | [GoogleScholar](#)

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AKADEMISK UTDANNING PÅ HØYT NIVÅ

Ph.D. Trekonstruksjon

2023 Computational Design and Production
of Wood Constructions
NTNU i Gjøvik, NO

M.Sc. ITECH

2019 Integrative Technologies and
2017 Architectural Design Research
University of Stuttgart, DE

B.Sc. Sivilingeniør

2011 Bygningsstruktur og -teknikk
2006 Razi University, IR

BRED RELEVANT PROGRAMVAREKUNNSKAP

(CAD) Computer-aided / Computational Design
Rhino3D, Grasshopper, Python

(BIM) Building Information Modelling
Revit

(TRE) Trekonstruksjon
Cadwork, SEMA

(CAM) Computer-aided Manufacturing
Hundegger-Cambium og CNC-Maskinen

FLERE ÅRS INTERNASJONAL ARBEIDSERFARING

senior. KONSTRUKTØR (TRE)

d.d. Modulære Trekonstruksjoner
2023 timpla GmbH, Eberswalde-Berlin, DE

junior. KONSTRUKTØR

2020 Computational / CAD Design
Werner Sobek AG, Stuttgart, DE

vit.ass VITENSKAPELIG ASSISTENT

2019 Masteroppgave @ Fraunhofer Institute
2018 HiWi @ ICD og ITKE/ BioMat Institute
2017 Universitet Stuttgart, DE

junior. PROSJEKTINGENIØR

2016 BIM / CAD Modellering
2014 T.AHA Architecture, Teheran, IR

SPRÅKFERDIGHETER – FIRE SPRÅK

Persisk morsmål

Engelsk flytende på akademisk nivå (C2)

Tysk avansert i arbeidssammenheng (C1)

Norsk selvstendig i kommunikasjon (B2)

Denne porteføljen handler om computational design,
integrerte teknologier og digital fabrikasjon.

Den består av to kapitler:

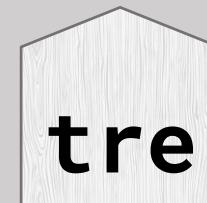


KAPITTEL I



teknologiske
prosjekter

KAPITTEL II



trebaserte
prosjekter



Vennligst se i fullskjerm

KAPITTEL I



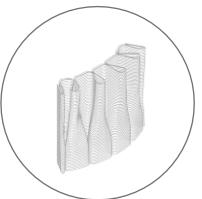
teknologiske
prosjekter

Det første kapittelet fokuserer på **integrativ teknologi i arkitektur**,
i sammenheng med **computational design** og **digital fabrikasjon**.

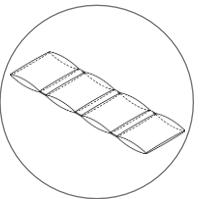
KAPITTEL I



teknologiske prosjekter



1 FUTURE TRADITION
Robotic Clay Printing



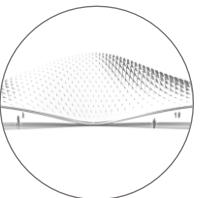
2 JOINT FREE MOVEMENT
Fiber Composite Production



3 T-BEAM
Bending Active Plates



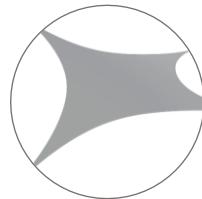
4 FLECTOFOLD
Frame Steel CNC Fabrication



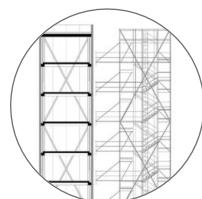
5 TRAIN STATION
Flectofold Competition Proposal



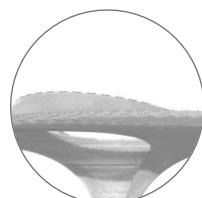
6 ITECH RESEARCH DEMONSTRATOR 2019
Biomimetic Adaptive Architecture



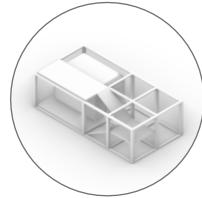
7 ELECTROACTIVE SKIN
Electroactive - Textile Production



8 ADAPTIVE TOWER
SFB1244 Demonstrator



9 MAIN STATION STUTTGART 21
Complex Concrete Reinforcement



10 MODUS HIGH-RISES
Modular Procedural Assembly

work

FUTURE TRADITION

Rethink of Vernacular Clay Cooling System

tech

KUKA Robotic Clay Printing, Environmental Analysis

role

Competition: Future Tradition

2016

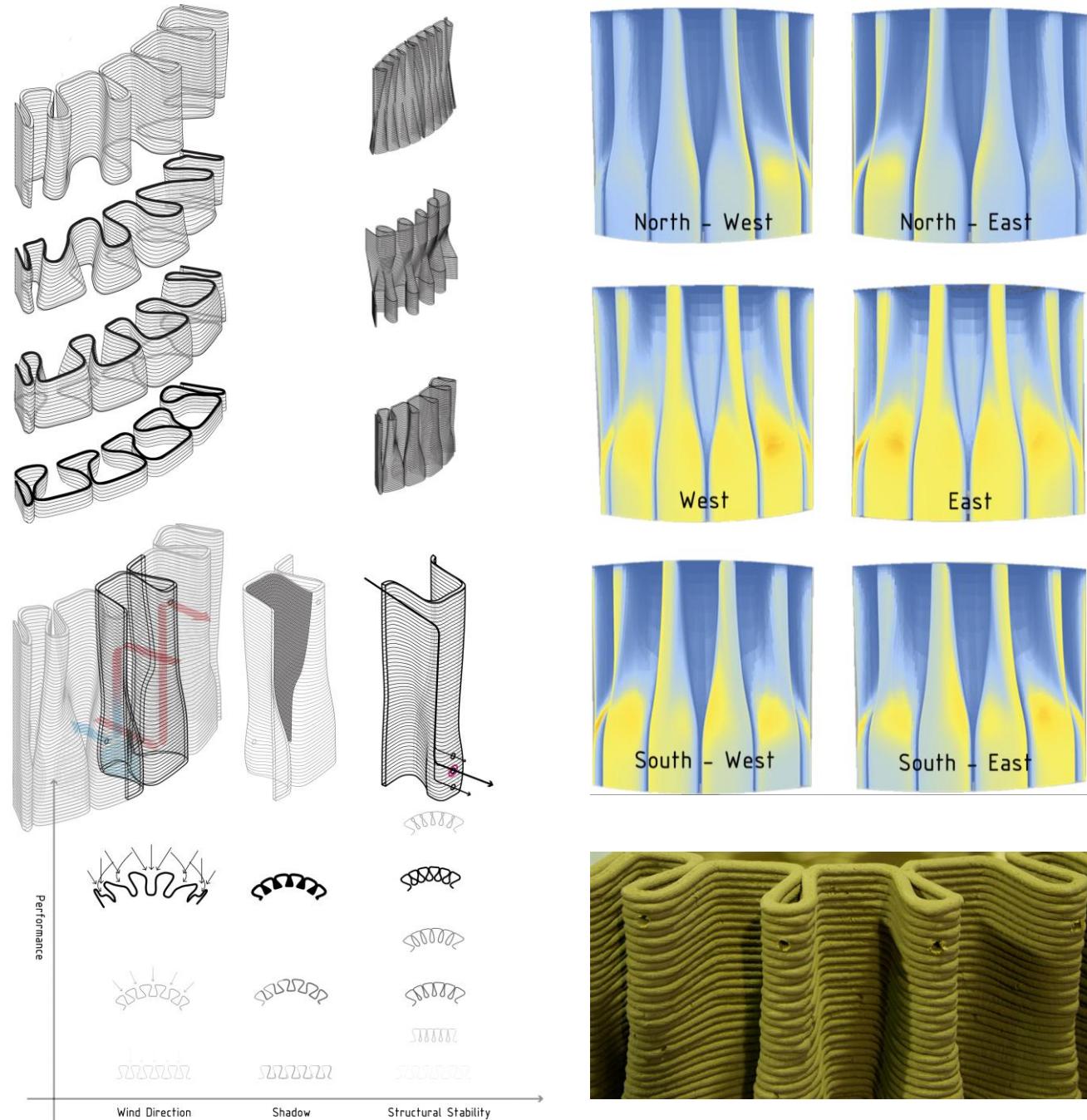
Contemporary Architect Association (CAA), IR

task

Entire Process



The main aim of the project is to reinterpret the environmental mechanism of traditional clay vase in the context of architecture, using robotic fabrication.



work

JOINT FREE MOVEMENT

Shape-changing Fiber Composite Plates

tech

Pneumatic Cushions, Glass Fiber

role

ITECH Course: Architectural Biomimetic

2017

ICD Institute, University of Stuttgart, DE

task

Entire Process

The aim of this research project is to control the elastic stiffness and bending behavior of a fiber composite plate with pneumatic actuation.

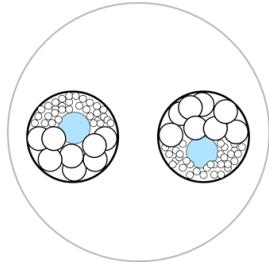
Biological Role Model: Mimosa Pudica



One branch

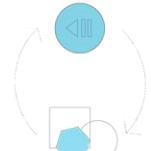


Petiole with leaves



Cells in Pulvilli

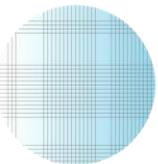
RELEVANT PRINCIPLES FOR ABSTRACTION



Fusion of
actuators



Pressure
change



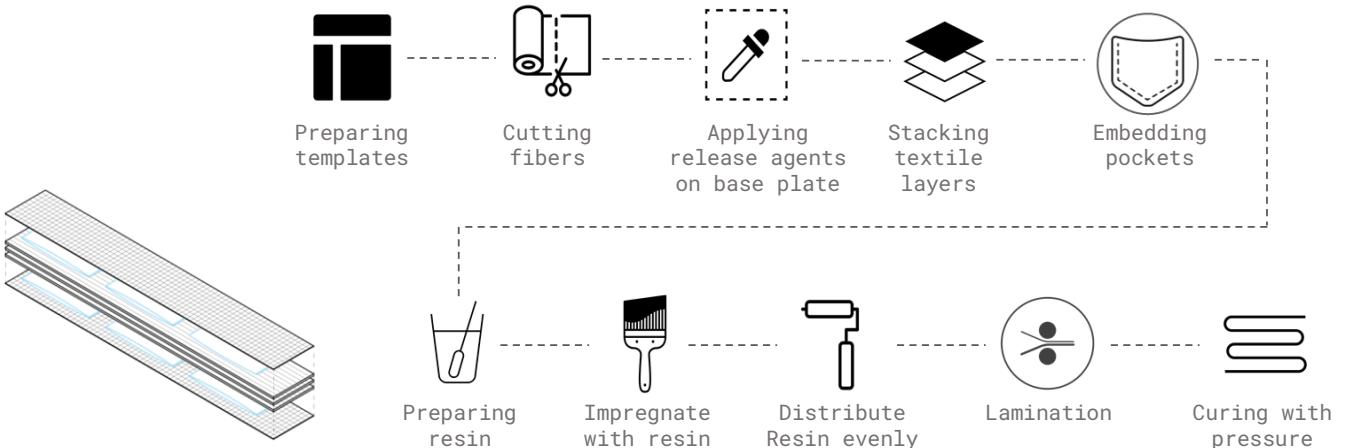
Material
gradient



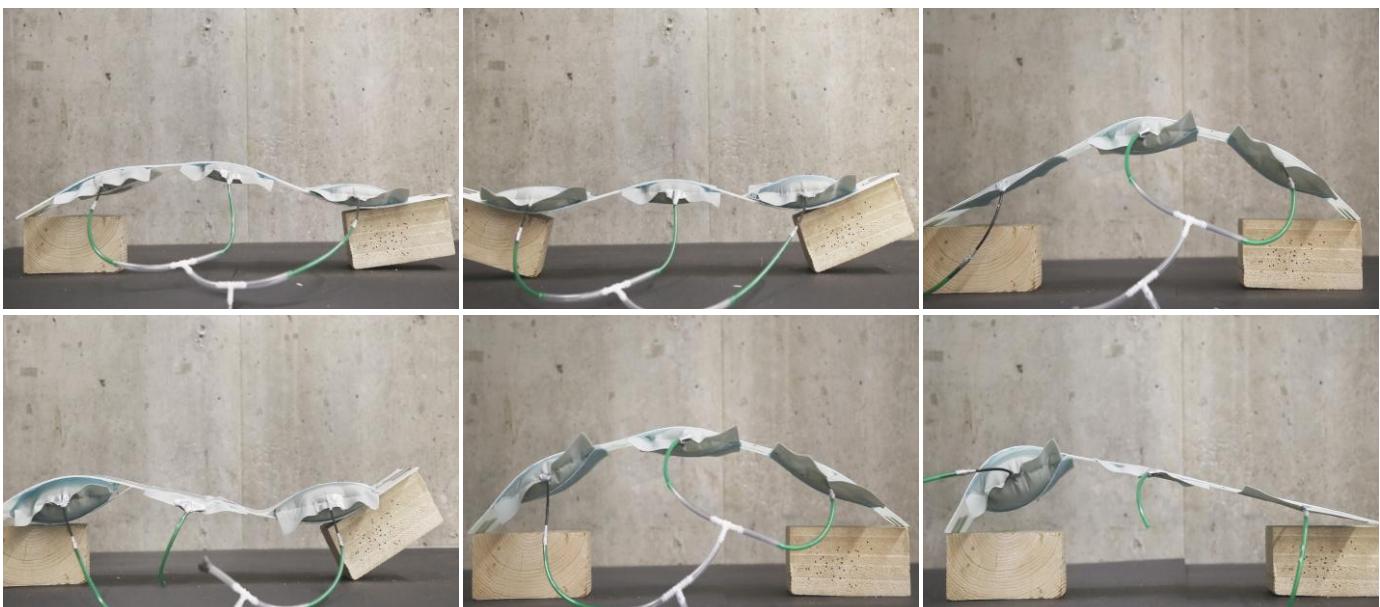
Compliance



Reversibility
and freedom



1x Glass fiber woven fabric 0/60
2x Plastic (pocket)
3x Glass fiber fabric, unidirectional
2x Plastic (pocket)
1x Glass fiber woven fabric 0/60



work

T-BEAM

Curved Bending T Cross-sections

tech

Typology Optimization and Manual Prototyping

role

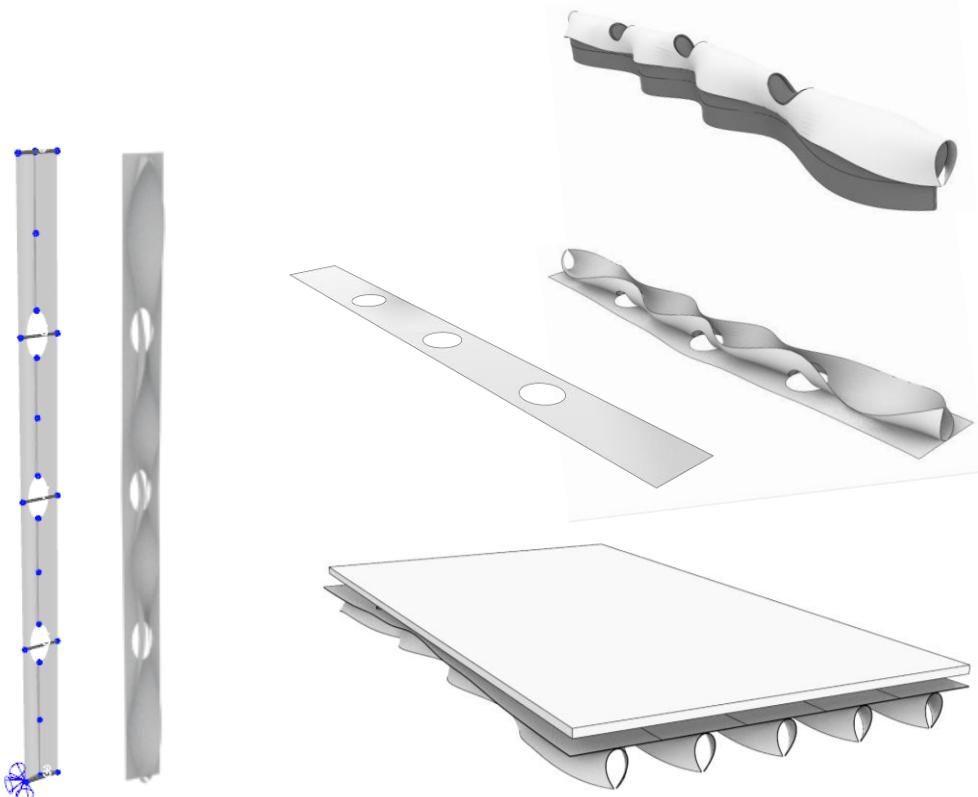
ITECH Course: Material and Structure

2018

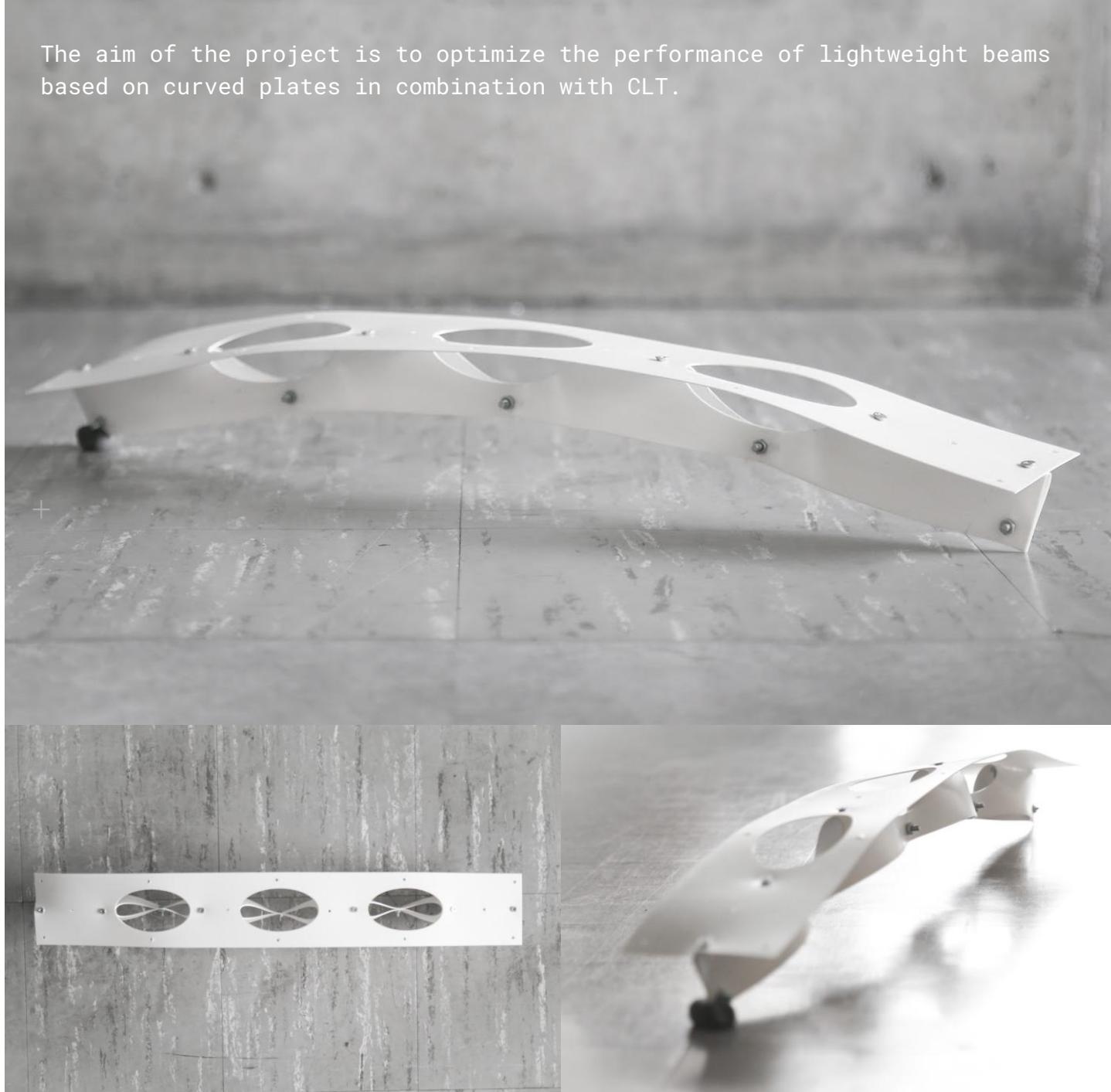
ITKE Institute, University of Stuttgart, DE

task

Entire Process



The aim of the project is to optimize the performance of lightweight beams based on curved plates in combination with CLT.



work

FLECTOFOLD

Demonstrator & Performance Monitoring Device

tech

Compliant Mechanism

role

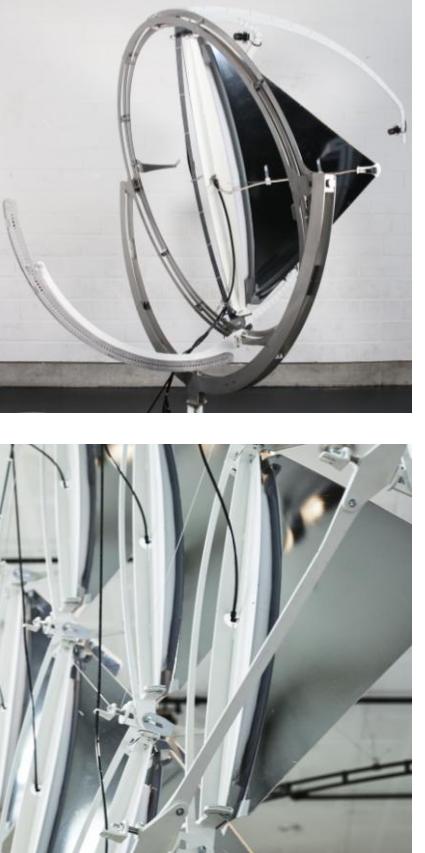
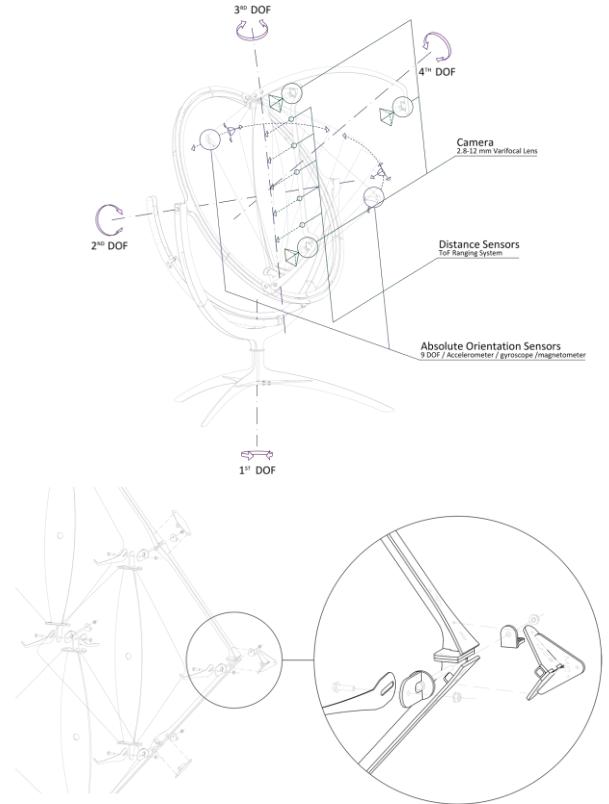
Student Assistant (HiWi)

2018

ITKE Institute, University of Stuttgart, DE

task

Design Development, Fabrication, Assembly



Pictures © ITKE University of Stuttgart

The aim of this project was to monitor, evaluate and showcase the potential of materially graduated FRP as a material solution for climate adaptive building envelopes. To read more, click [here](#).



work

TRAIN STATION

FlectoFold Design Development

tech

Compliant Mechanism

role

Competition

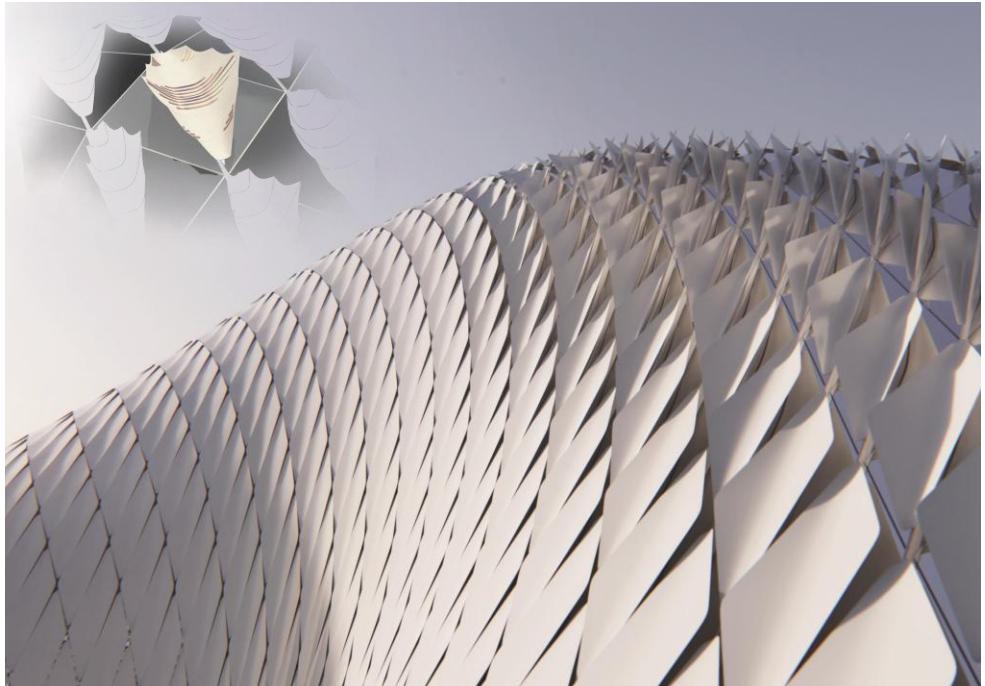
2018

Saman Saffarian Architecture Office, CZ

task

Circulation Design and Functioning Diagrams

The aim of this project was to propose an airport using segmented Flectofold shell for environmental adaptation.



Pictures © Saman Saffarian



work

ITECH RESEARCH DEMONSTRATOR 2018-19

Biomimetic Adaptive Architecture

tech

Robotic Carbon Fiber Placement, Haptic Adaptive

role

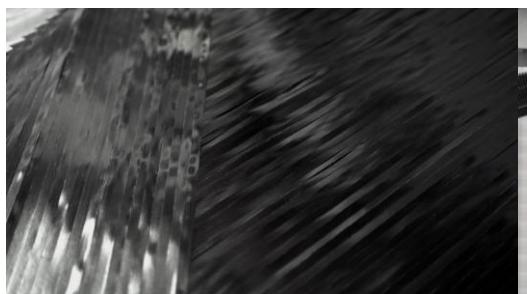
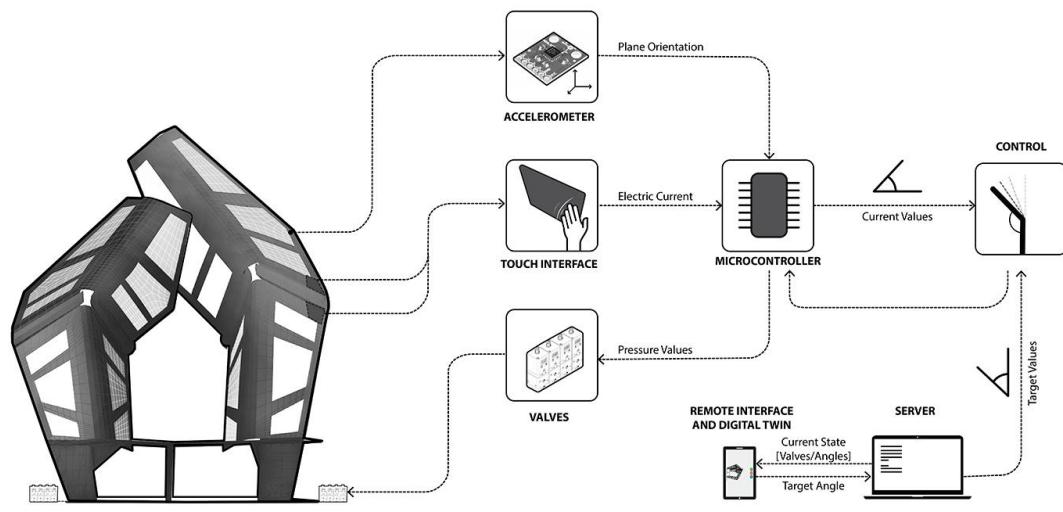
ITECH Studio Project (2019)

2019

ICD / ITKE Institutes, University of Stuttgart, DE

task

Simulation, Fabrication



Pictures © ITKE / ICD University of Stuttgart

The ITCHECH research demonstrator 2018/19 investigates large-scale compliant architecture inspired by the folding mechanisms of the Coleoptera Coccinellidae (Ladybug) wings. To read more click [here](#).



work

ELECTROACTIVE SKIN

Towards Bio-inspired Responsive Envelopes

tech

Integration of EAP with Textile

role

Master's Thesis (2019)

2019

University of Stuttgart (*BioMat/ITKE, ICD*), DE
Fraunhofer Institute (*IPA*), DE
Institute of Aircraft Design (*IFB*), DE

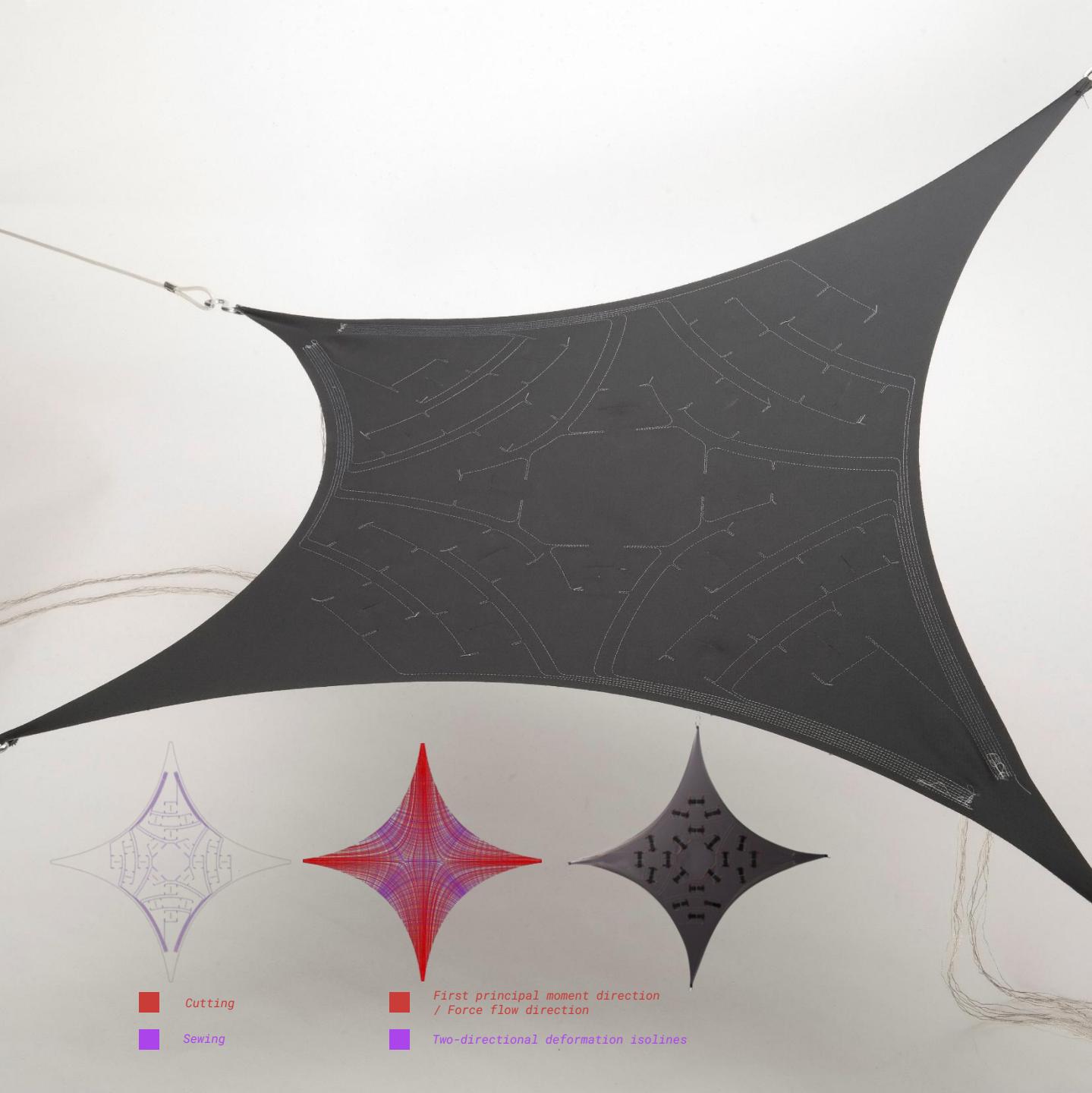
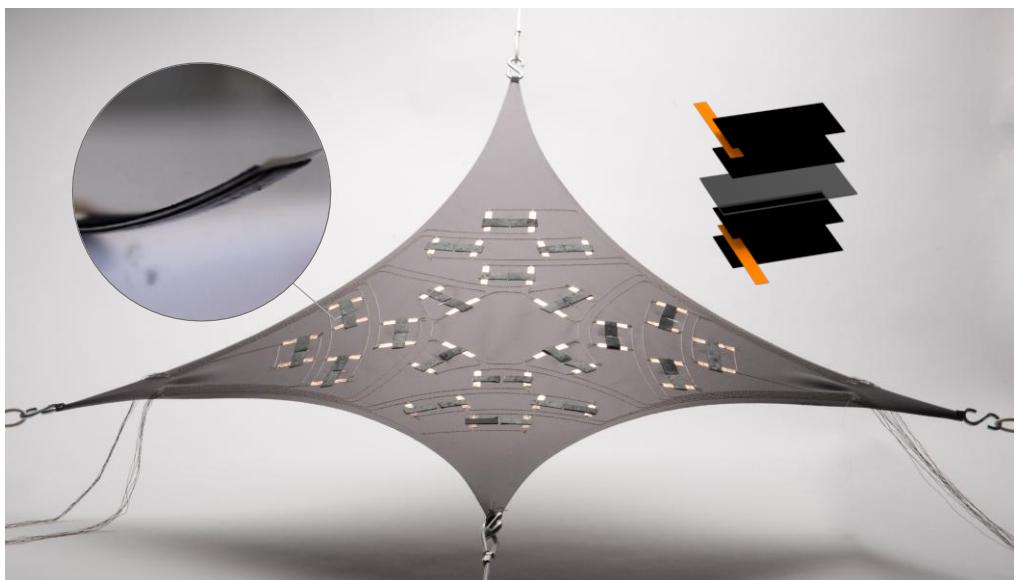
task

Entire Process

The aim of this research is to investigate actuatable apertures in architectural skin through incorporation of ionic electroactive polymer.

To see the video, click [here](#).

To read the published paper, click [here](#).



work

ADAPTIVE TOWER

SFB1244 Adaptive Building Skin Demonstrator

tech

Integration of EAP with Textile

role

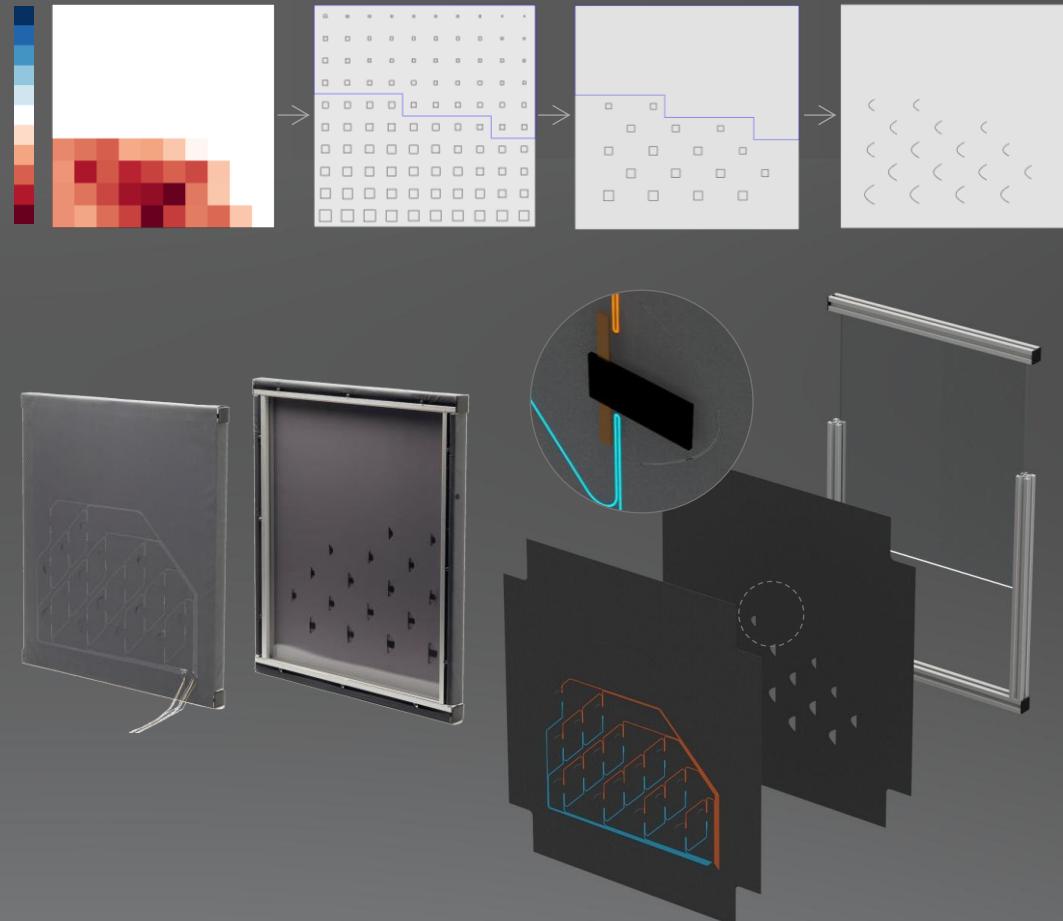
Master's Thesis (2019)

2019

University of Stuttgart (*BioMat/ITKE, ICD*), DE
Fraunhofer Institute (*IPA*), DE
Institute of Aircraft Design (*IFB*), DE

task

Entire Process



This research contributes to the ongoing SFB1244 "Adaptive Building Skins and Structures for the Built Environment of Tomorrow", funded by the German Research Foundation (DFG) under the following schema:

C03 – Electroactive polymer actuators and arrays for switchable breathability in building skins

To read more, click [here](#).



work

MAIN STATION STUTTGART 21

Reinforced Concrete Shell

tech

Computational

role

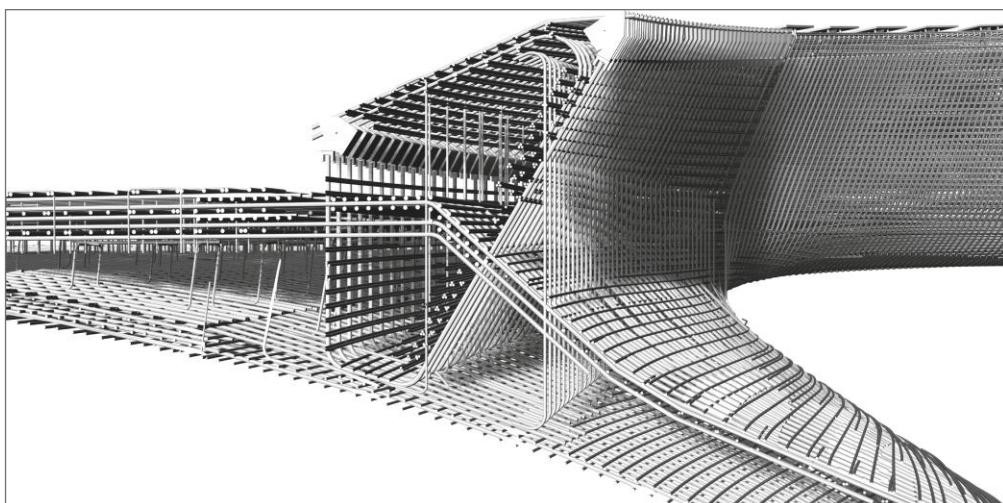
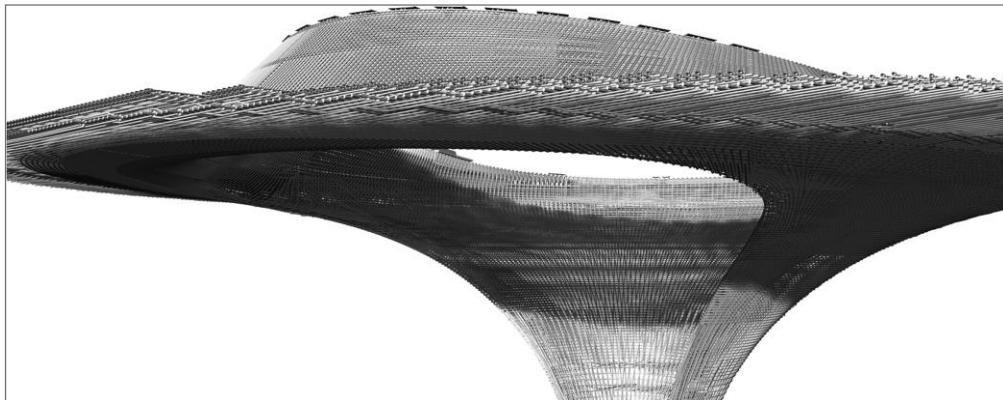
Full-time Employment

2020

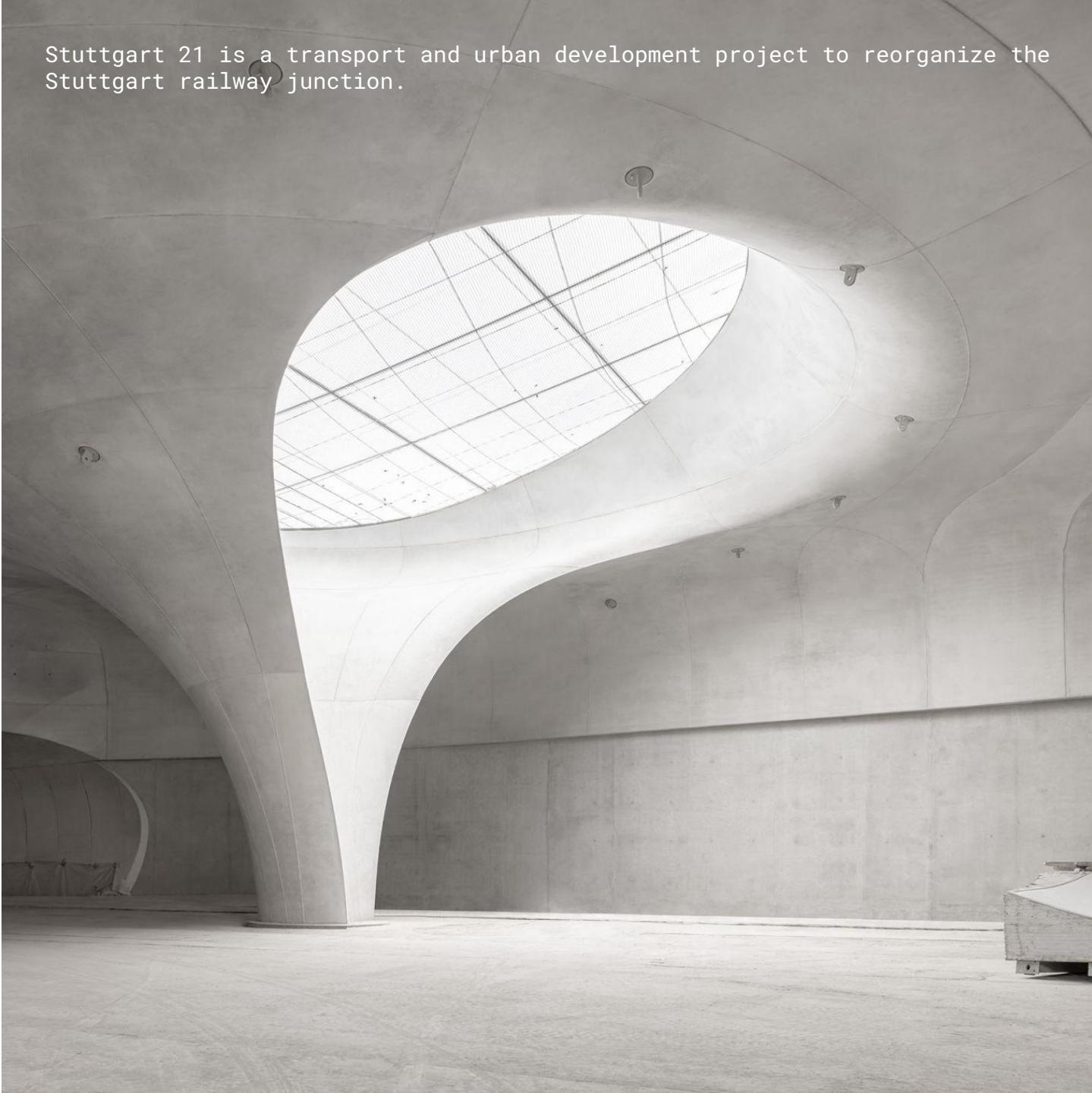
Werner Sobek AG Stuttgart, DE

task

Computational Design



Stuttgart 21 is a transport and urban development project to reorganize the Stuttgart railway junction.



work

MODUS HIGH-RISES

Modular Procedural Assembly

tech

Computational Design

role

Individual Project

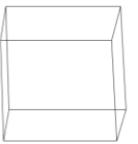
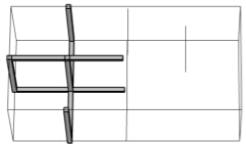
2020

DesignMorphine Workshop

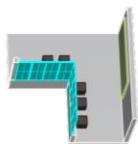
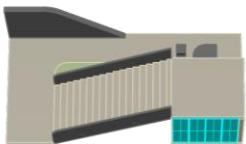
task

Computation

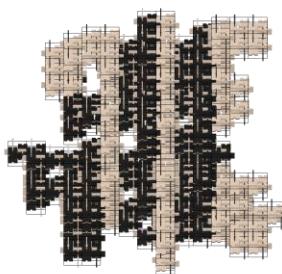
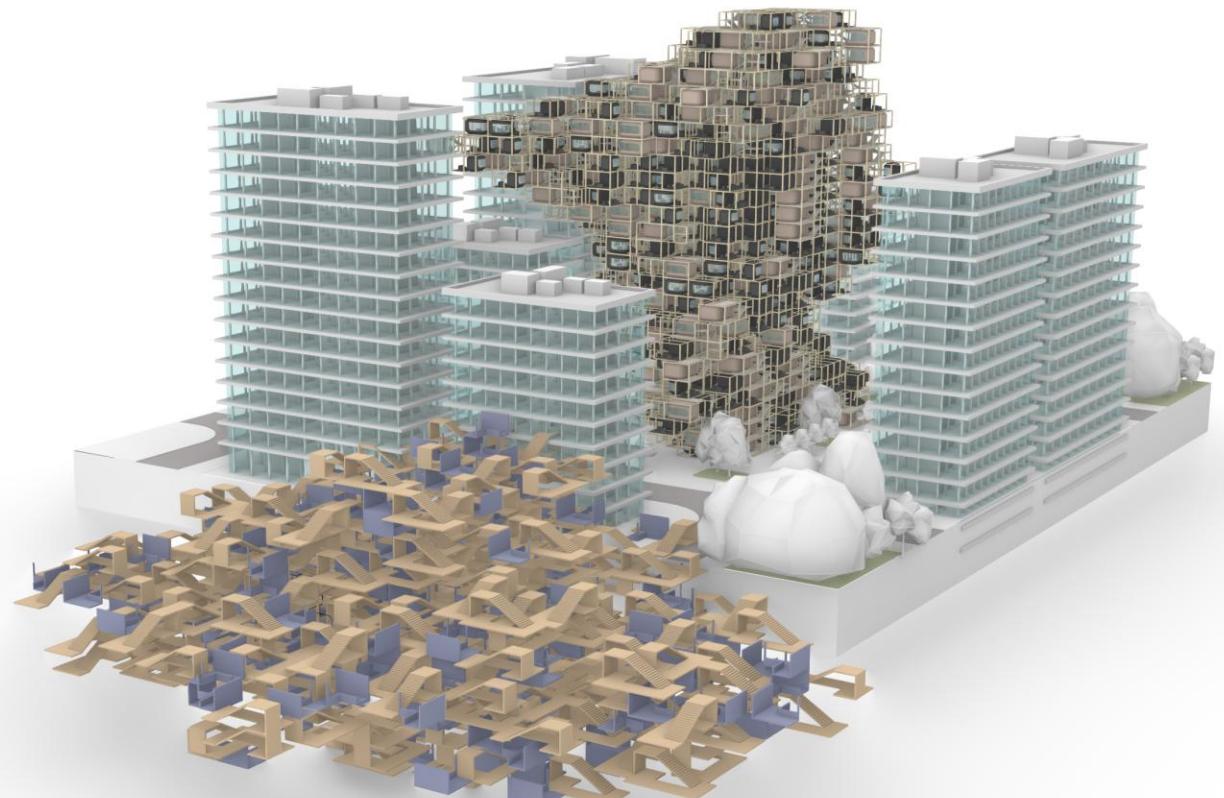
The aim is to create modular procedural modules via WASP within growing transformative spaces, that can react to the changing streams of the information society.



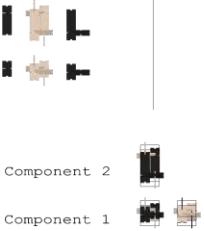
Modules Option 2



Modules Option 1

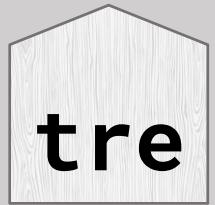


Two Components Aggregation



One Component Aggregation

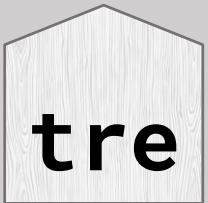
KAPITTEL II



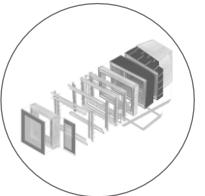
trebaserte
prosjekter

Det andre kapittelet inkluderer **utvalgte innovative treprosjekter** som viser et aspekt ved tre og dets tilhørende **fabrikasjonsteknikker**.

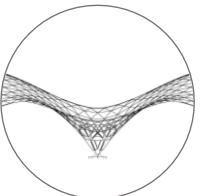
KAPITTEL II



trebaserte
prosjekter



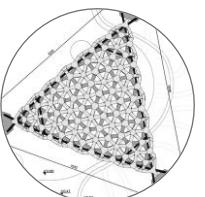
1 IBA TIMBER PROTOTYPE HOUSE
Advance CNC Fabrication



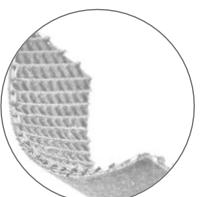
2 FUNICULAR TIMBER GRIDSHELL
Form-finding



3 SHINGLE WALL
KUKA Robotic Fabrication



4 BIOMAT PAVILION
Vacuum Molding Bio-material



5 SMART BIO-STRUCTURE
Wood Filament 4D-Printing



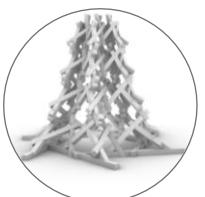
6 ODIN CHAIR
Bending Active CNC Plywood



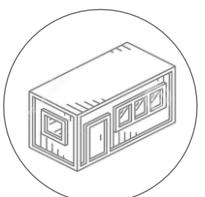
7 HEXA TOWER
Triple Scarf Timber Joinery



8 INTER-HYGRO-JOINERY
Hygroscopic Analysis via CT Scanning



9 INTERLOCKING TOWER
Hundegger Production and AR Assembly



10 MODULAR HOUSING
Timber Construction and Manufacturing

work

IBA TIMBER PROTOTYPE HOUSE

Digital Log Cabin

tech

Computational Design and CNC production

role

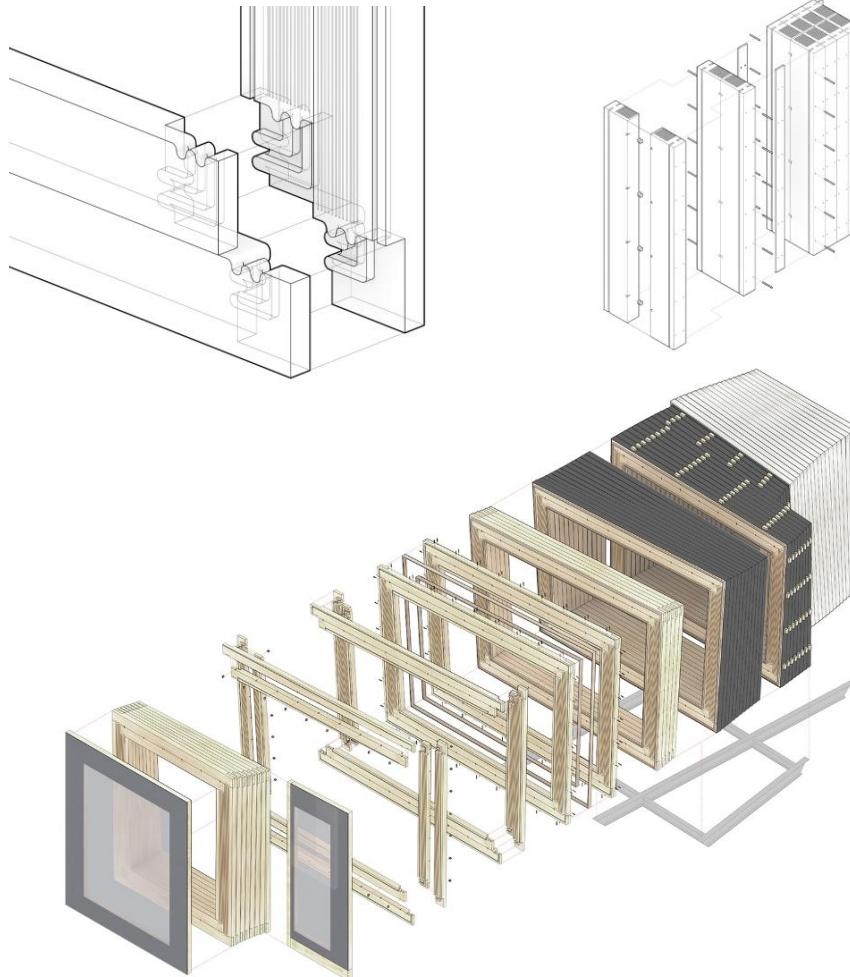
Student Assistant (HiWi)

2017

ICD Institute, University of Stuttgart, DE

task

Construction



Pictures © ICD/ITKE University of Stuttgart

The IBA Timber Prototype House combines the benefits of traditional low-cost timber construction with advances in computational design and fabrication technologies. To read more click [here](#)



work

FUNICULAR TIMBER GRIDSHELL

Timber Grid-shell with Steel Connectors

tech

Form-finding and Optimization for 3D-printing

role

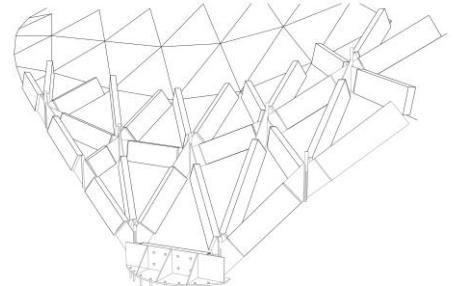
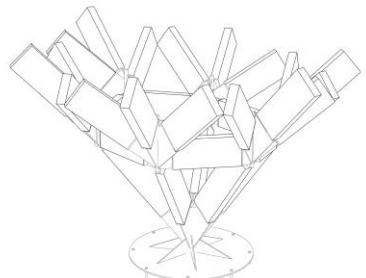
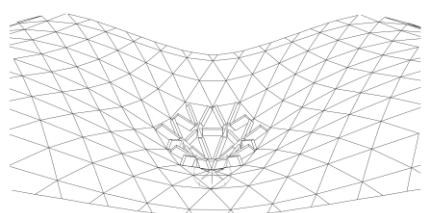
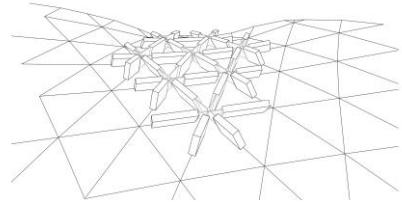
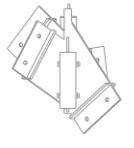
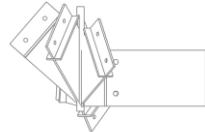
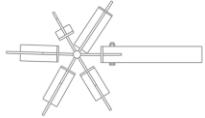
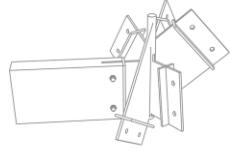
ITECH Course: Form-finding

2017

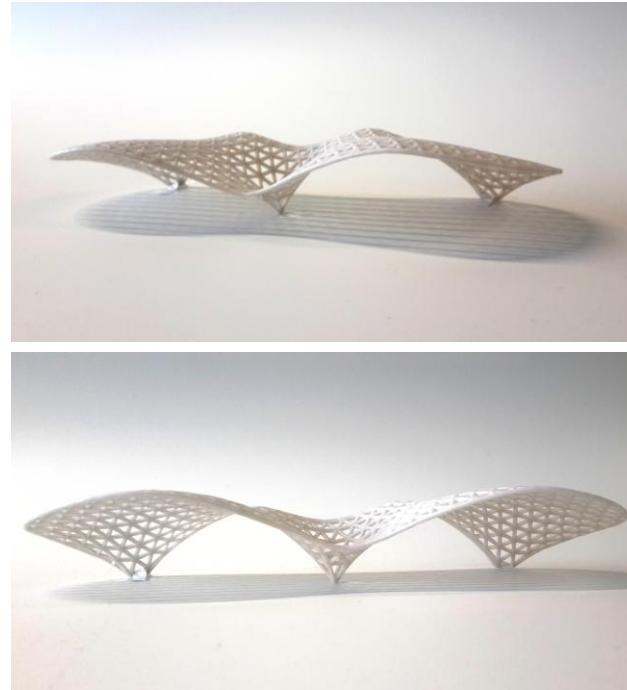
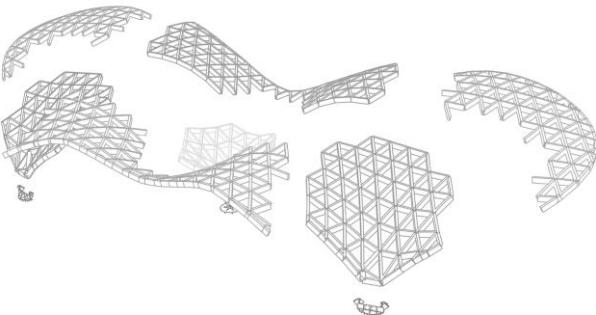
ITKE Institute, University of Stuttgart, DE

task

Entire Process



The aim of this project is to create series of bus stations as a part of VVS in Stuttgart based on funicular timber grid shell.



work

SHINGLE WALL

Shingle Component

tech

Computational Design and Robotic Fabrication

role

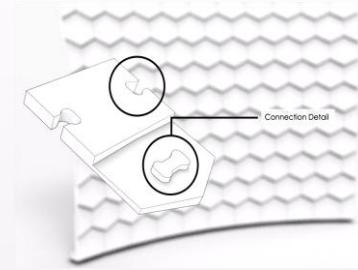
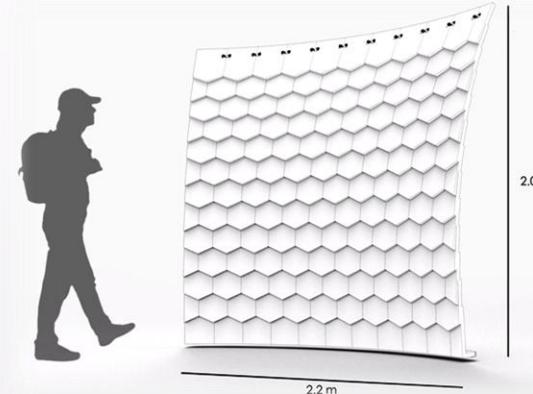
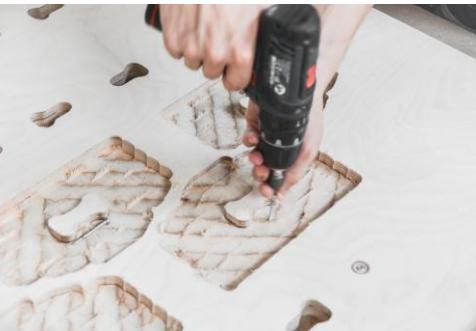
ITECH Group Project

2018

ICD Institute, University of Stuttgart, DE

task

Entire Process



The Shingle Wall is a robotically fabricated segmented synclastic shell, which is the outcome of the robotic milling assignment of ITECH's Computational Design and Fabrication Seminar 2018.



work

BIOMAT PAVILION

Bio-composite Flexible Wood Segmental Shell

tech

Vacuum Molding Bio-material

role

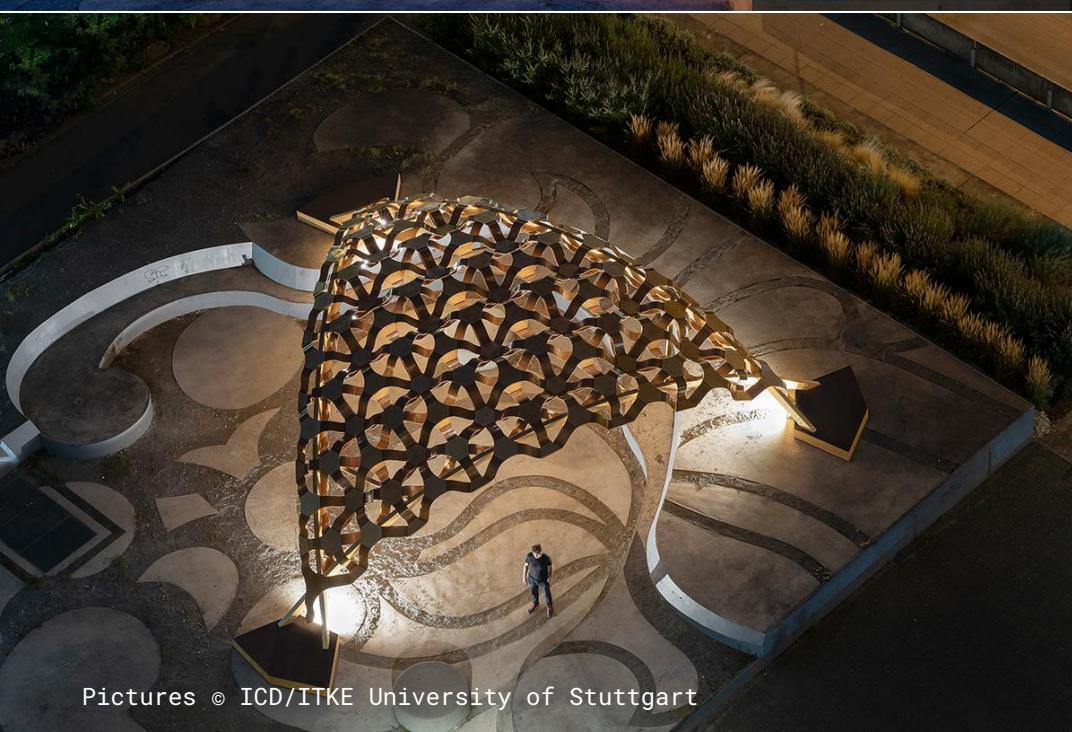
Student Assistant (HiWi)

2018

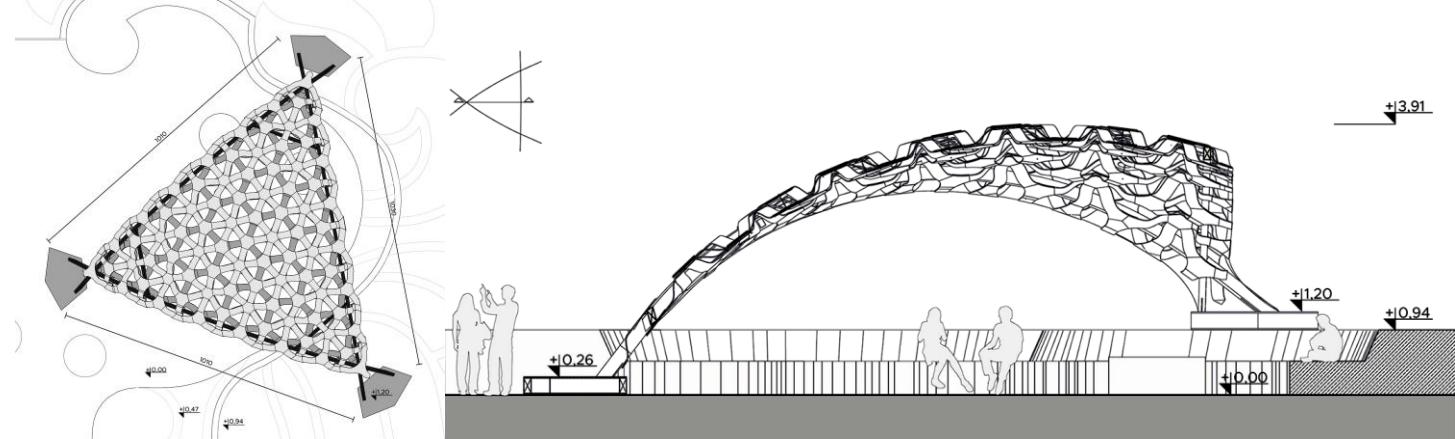
BioMat Institute, University of Stuttgart, DE

task

Manufacturing and Assembly



Pictures © ICD/ITKE University of Stuttgart



The pavilion is a double-curved, parametrically designed segmental shell of light, single-curved wood and bio-composite elements supported by three curved crossed wooden beams.



work

SMART BIO STRUCTURE

Passive Adaptive Façade System

tech

4D Printed Programmable Hygroscopic Wood

role

Student Assistant (HiWi)

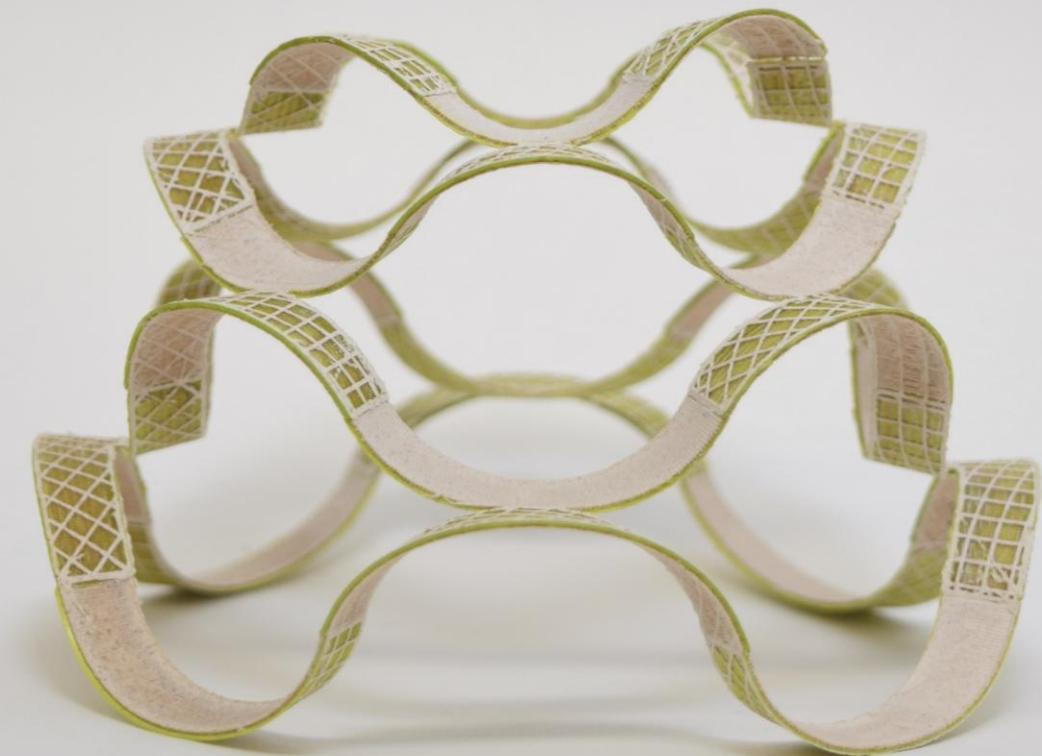
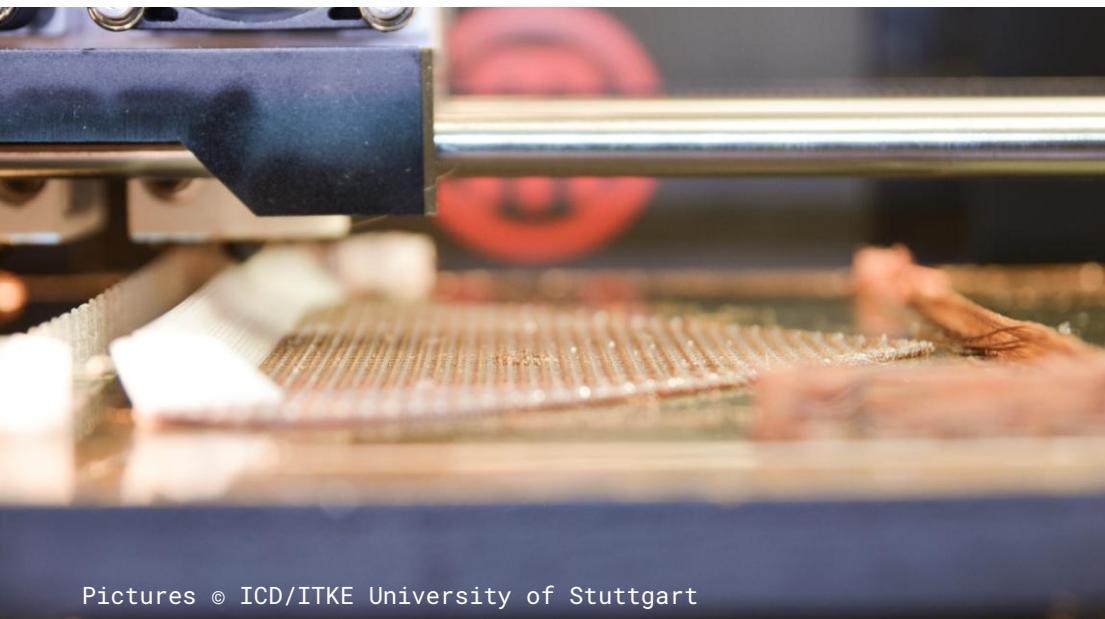
2019

ICD Institute, University of Stuttgart, DE

task

Simulation and Production

The potentials of programmable 4D-printing of wood filament to create environmentally passive responsive facade systems.



work

ODIN CHAIR

Bending-active Structure

tech

Experimental Prototyping of CNC Plywood

role

ITECH Course: Chair Design

2019

BioMat Institute, University of Stuttgart, DE

task

Entire Process



The prepared CNC plywood layers were bended and connected in specific points leading to a 3D deformation from 2D sheets which, as a result, provided structural stiffness. To see the video, click [here](#).



work

HEXA TOWER

Triple Scarf Timber Joinery

tech

FEA and Fabrication Method

role

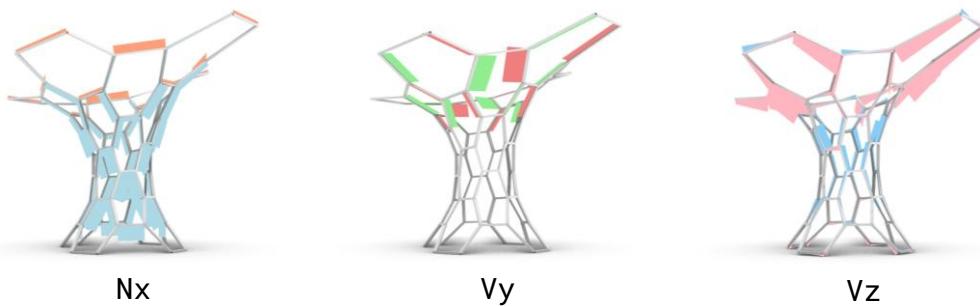
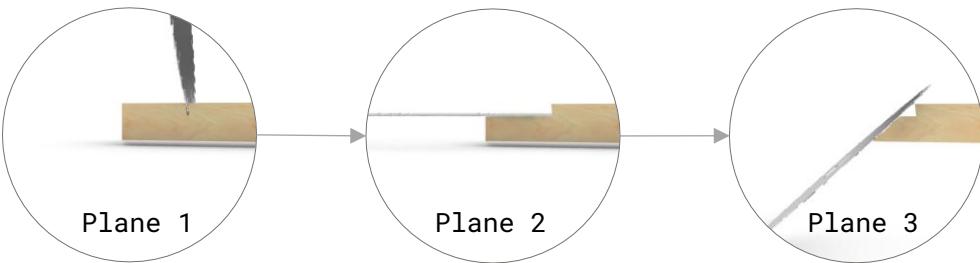
Research Project

2020

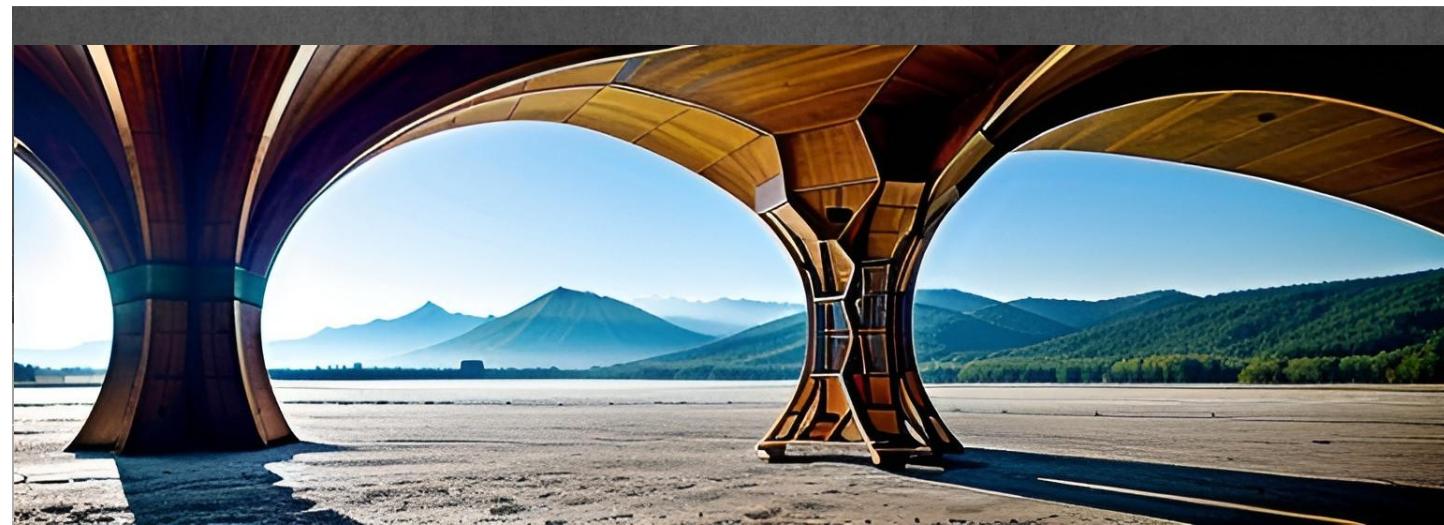
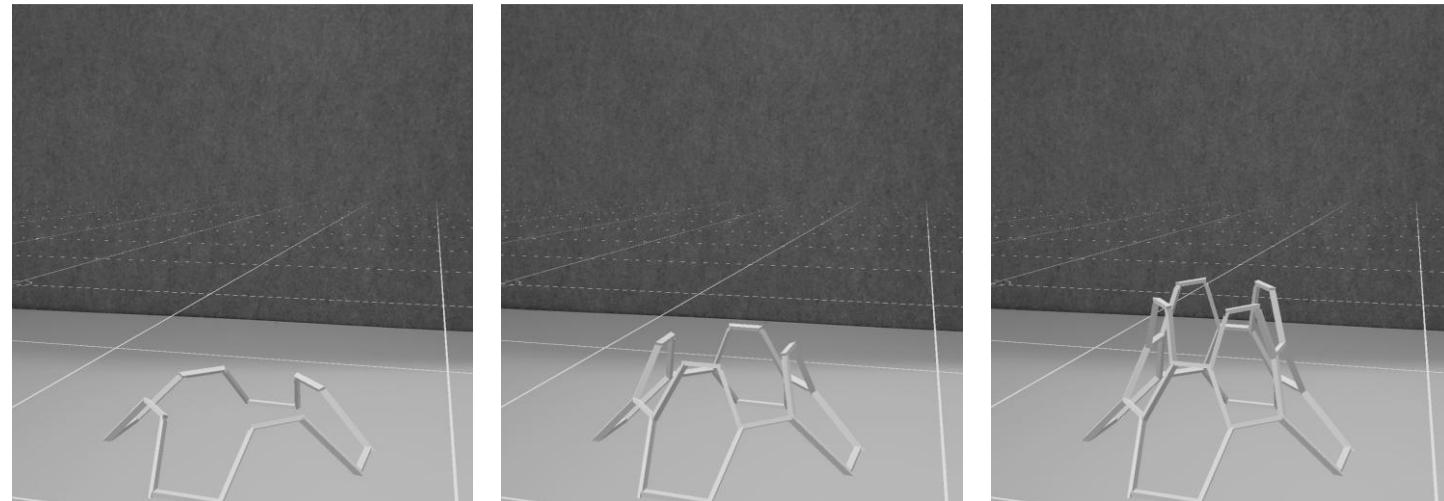
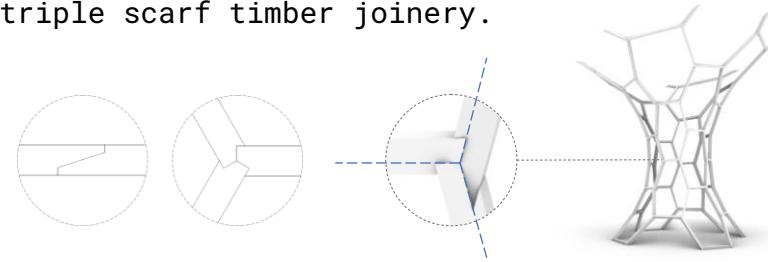
IVB Institute, NTNU i Gjøvik

task

Entire Process



The aim of this project is to rethink of vernacular scarf joinery and extend it for triple scarf timber joinery.



work

INTER-HYDRO-JOINERY

Encapsulating Interlocking Timber Joinery

tech

Hygroscopic Study of Wooden Joinery via CT Scanning

role

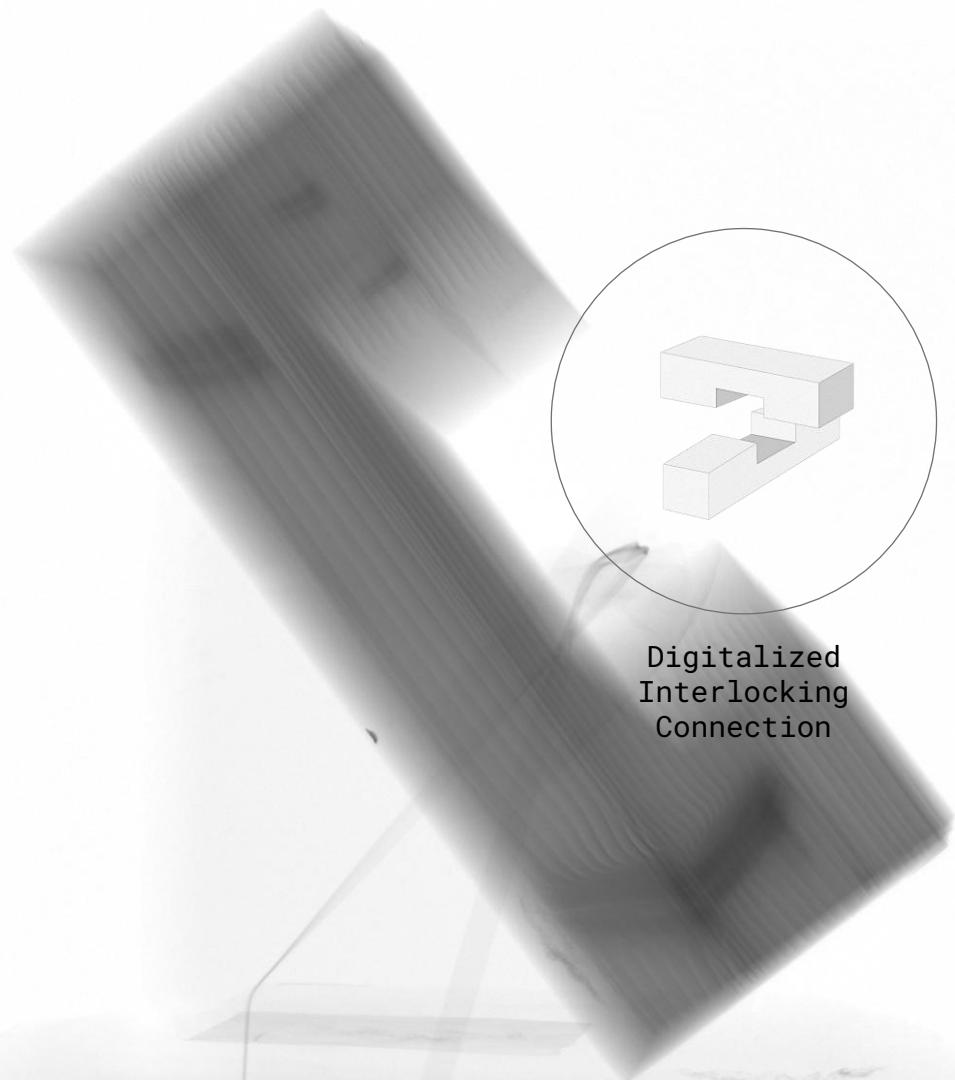
Research Project

2021

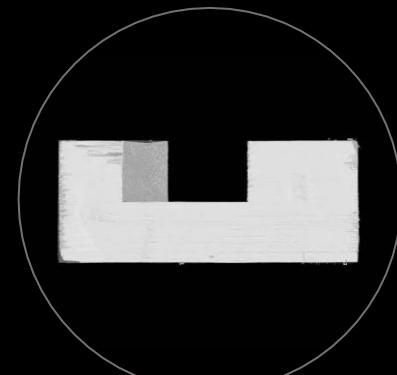
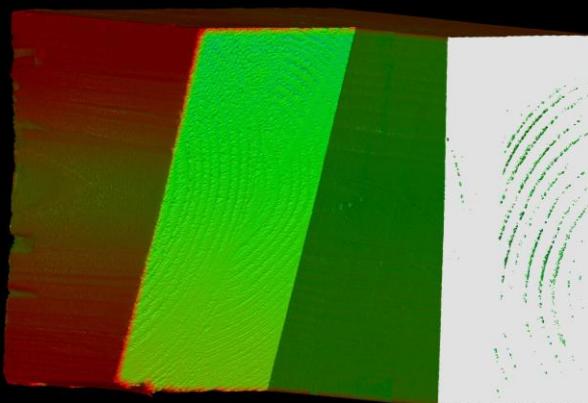
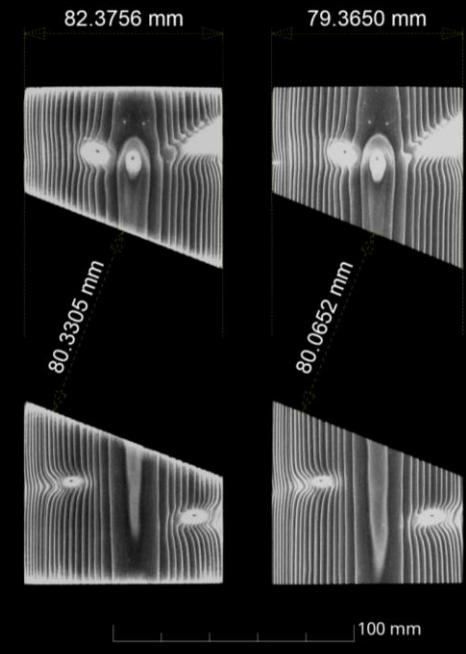
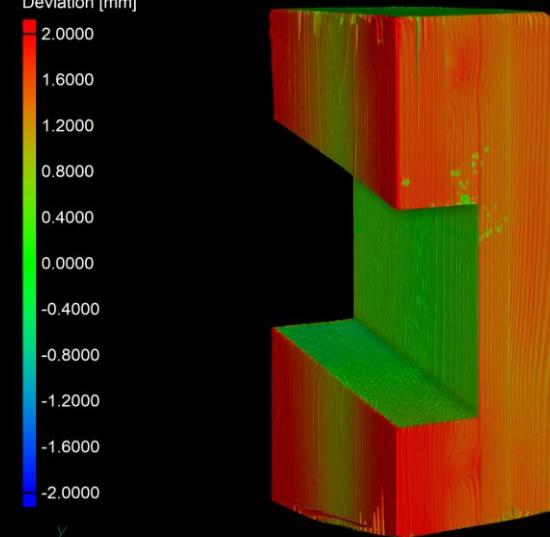
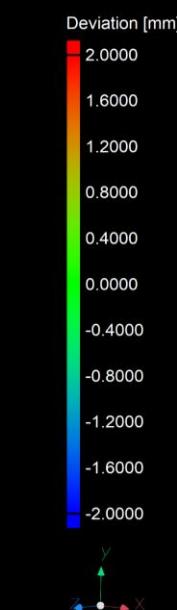
IVB Institute, NTNU i Gjøvik, NO

task

Entire Process



Investigation of wood's hygroscopicity via CT scanner to reinforce the structural capacity of interlocking connections.



work

INTERLOCKING TOWER

Sequential Circular Augmented Construction

tech

Hundegger Production and Sequential AR Assembly

role

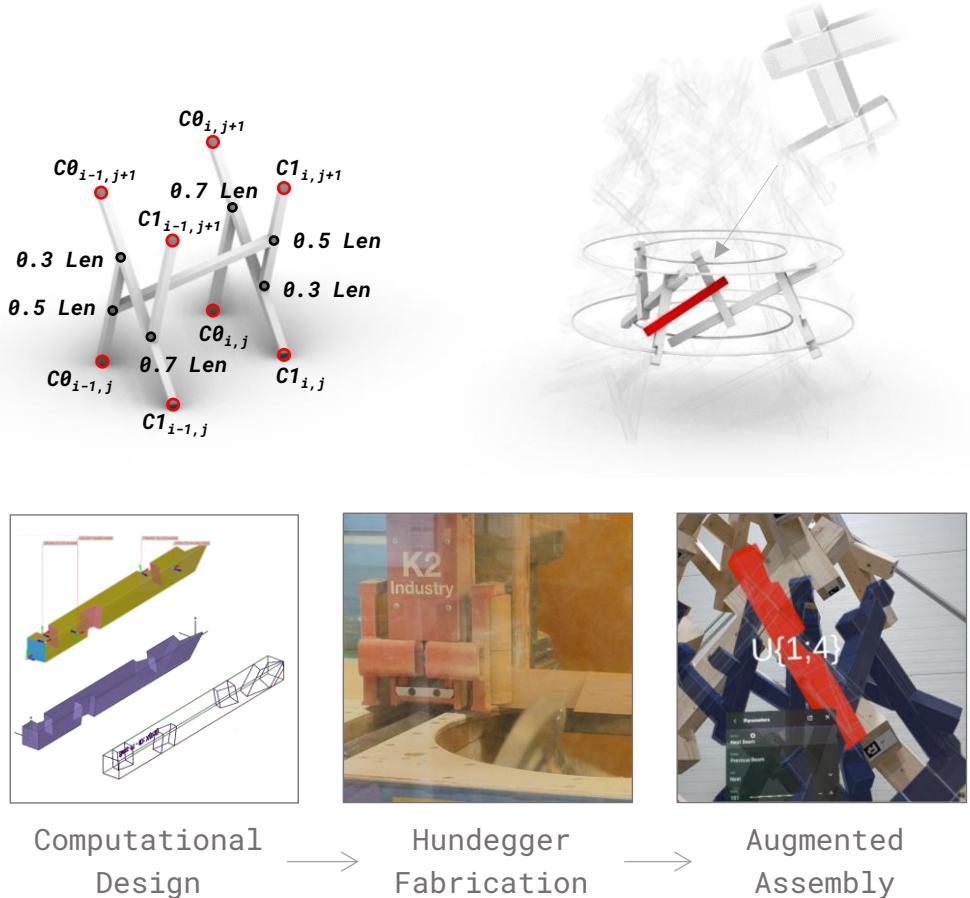
Research Project

2022

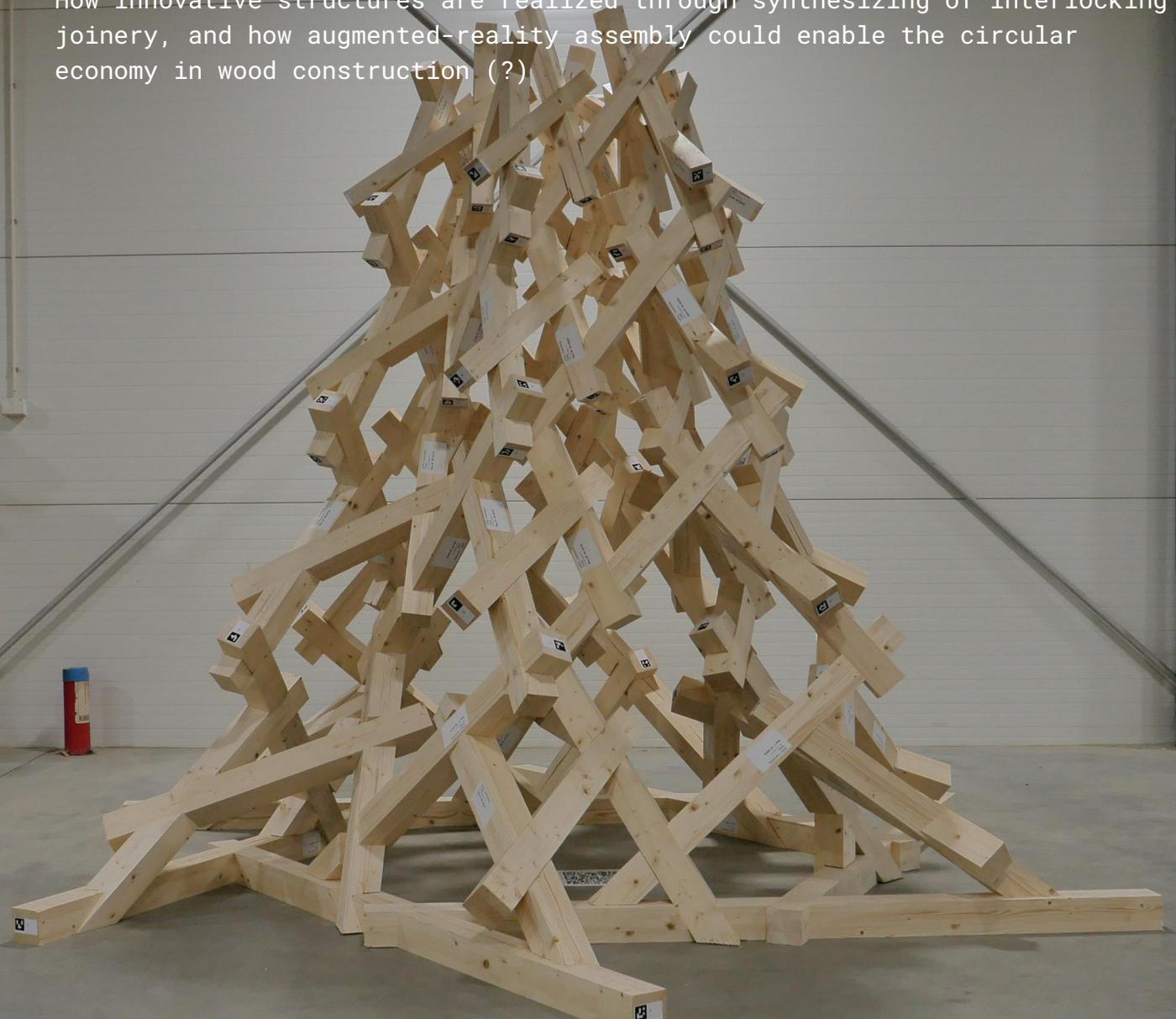
IVB Institute, NTNU i Gjøvik & Østlaft AG, NO

task

Entire Process



How innovative structures are realized through synthesizing of interlocking joinery, and how augmented-reality assembly could enable the circular economy in wood construction (?)



work

MODULAR HOUSING

Serial Timber Housing

tech

Modular Timber Construction and Production

role

Full-time Employment

2023

timpla GmbH, Eberswalde-Berlin, DE (timpla.eu)

task

Timber Construction Design

Germany's largest wooden module factory ...

We are industrializing wooden modular construction to establish it as the strongest and most sustainable alternative for residential and commercial construction.



Foto: Gataric Fotografie



Foto: Ruedi Walti



Foto: Stefan Hofmann, Biel