

SELECTED WORKS 2016-2022



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ARCHITECTURE

Project Name: Joyn Residency 2021
Year: 2021-2022
Location: CLB Berlin, Germany
Status: Built
Team: Studio Milz (Simon Deeg and Andreas Picker)(Mentoring, residency management), Pedro Serrano (Exhibition design and production, AR content and texts).
Type: artistic residency

The exhibition Assembly Strategies showed the results of the work carried out during the JOYN residency 2021, a project hosted by studio milz and funded by the ministry of culture of Chile. This first version of the residency program asks how new building technologies could help to imagine alternative ways of producing our built environment. In this specific case, the technology is the JOYN MACHINE.

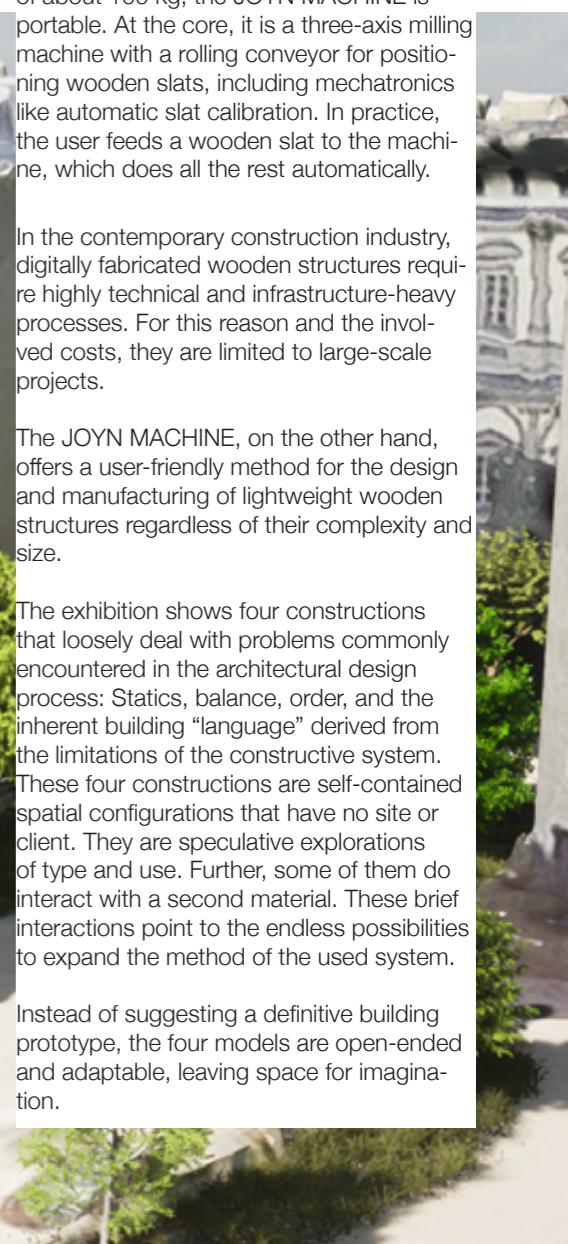
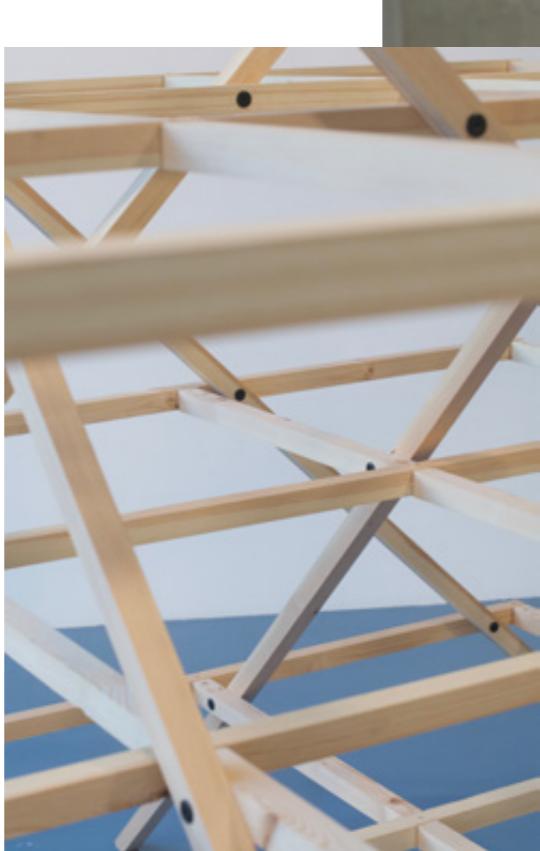
The JOYN MACHINE, developed by studio milz, follows an “all-in-one concept” covering the entire production chain from designing a wooden structure to manufacturing the parts that can get assembled into the designed wood structure afterward. The idea of providing one process that combines all these skills was achieved by closely linking software and hardware components to one fluently working process. With a weight of about 100 kg, the JOYN MACHINE is portable. At the core, it is a three-axis milling machine with a rolling conveyor for positioning wooden slats, including mechatronics like automatic slat calibration. In practice, the user feeds a wooden slat to the machine, which does all the rest automatically.

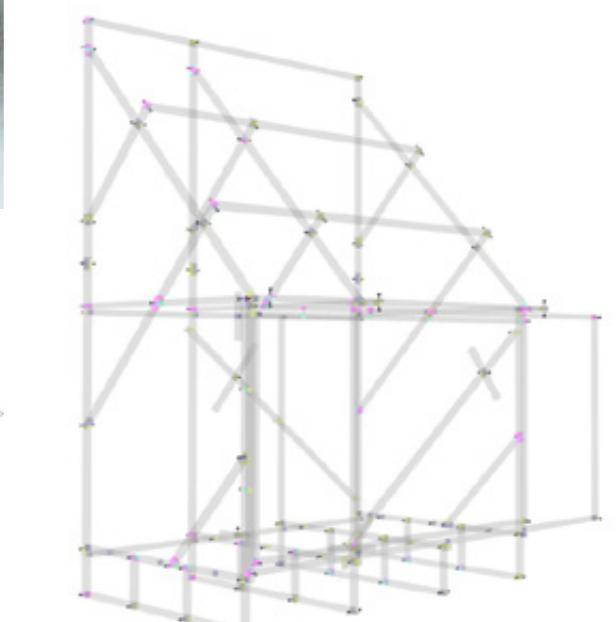
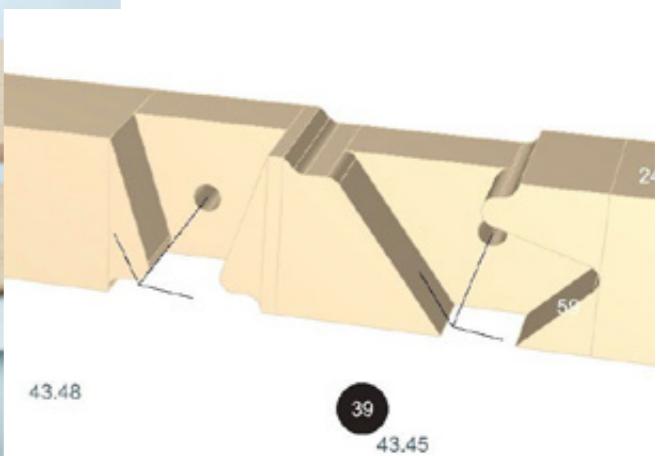
In the contemporary construction industry, digitally fabricated wooden structures require highly technical and infrastructure-heavy processes. For this reason and the involved costs, they are limited to large-scale projects.

The JOYN MACHINE, on the other hand, offers a user-friendly method for the design and manufacturing of lightweight wooden structures regardless of their complexity and size.

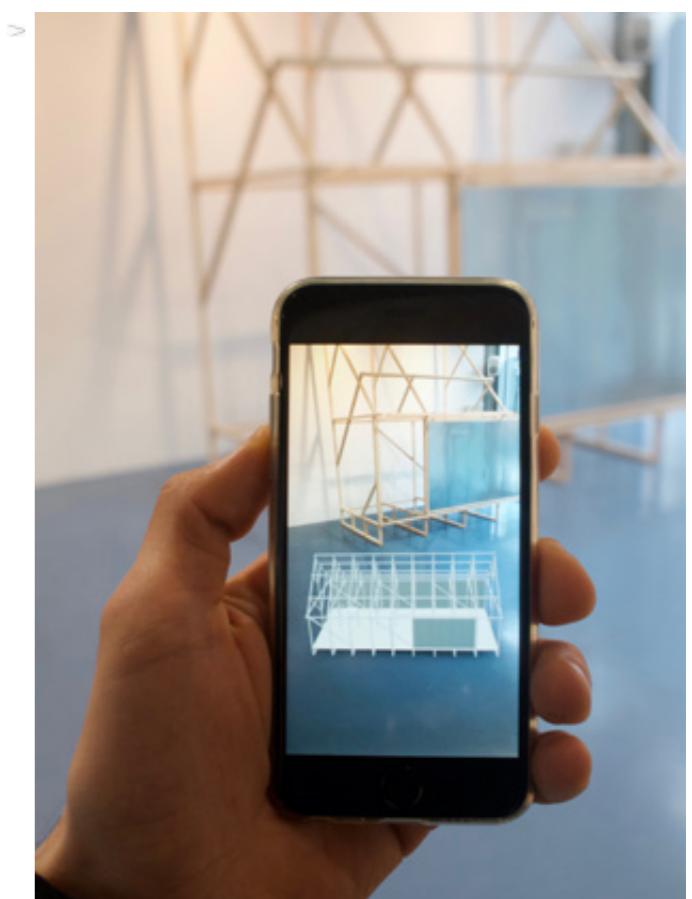
The exhibition shows four constructions that loosely deal with problems commonly encountered in the architectural design process: Statics, balance, order, and the inherent building “language” derived from the limitations of the constructive system. These four constructions are self-contained spatial configurations that have no site or client. They are speculative explorations of type and use. Further, some of them do interact with a second material. These brief interactions point to the endless possibilities to expand the method of the used system.

Instead of suggesting a definitive building prototype, the four models are open-ended and adaptable, leaving space for imagination.

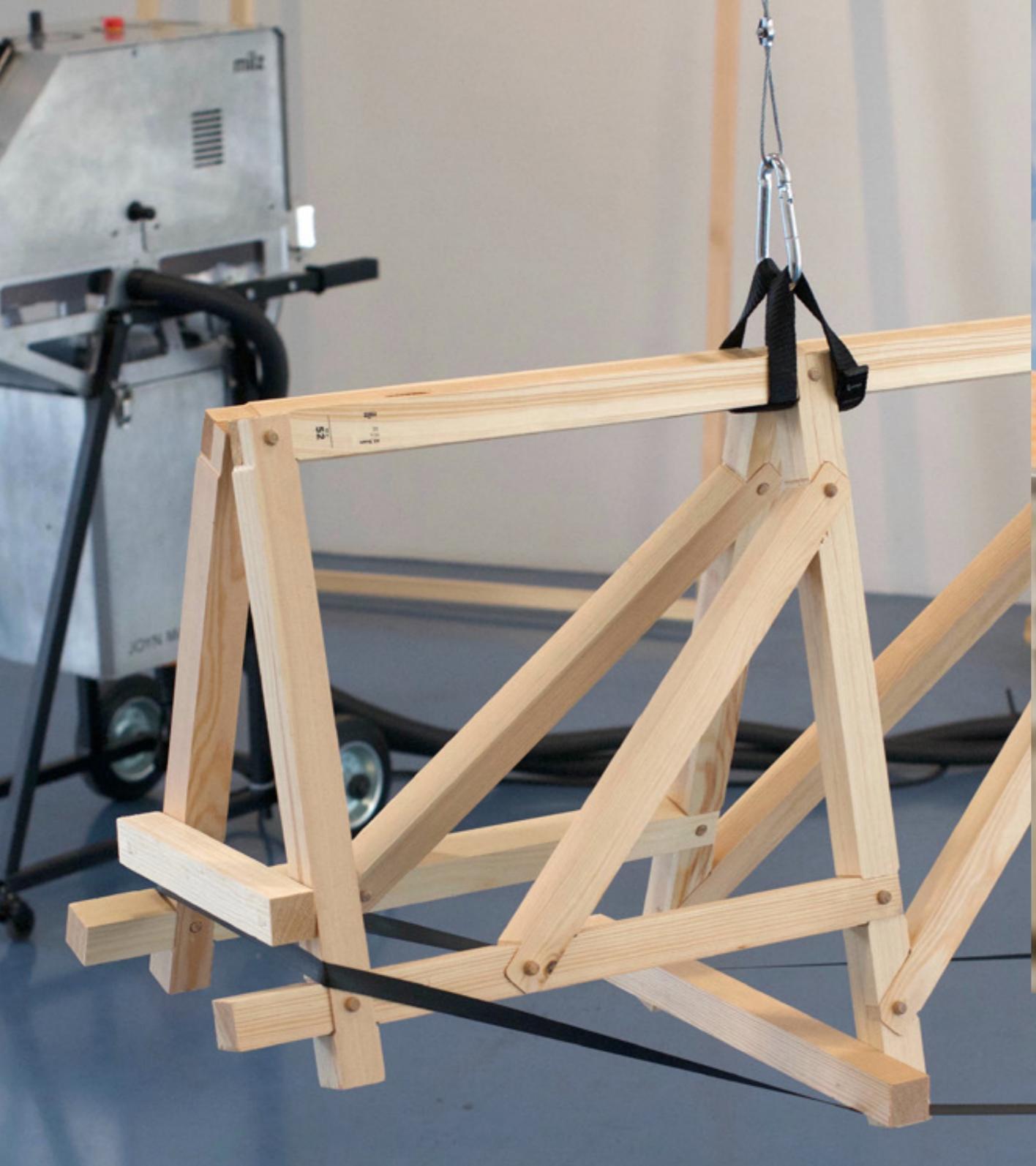




The design process was carried out using grasshopper based software.



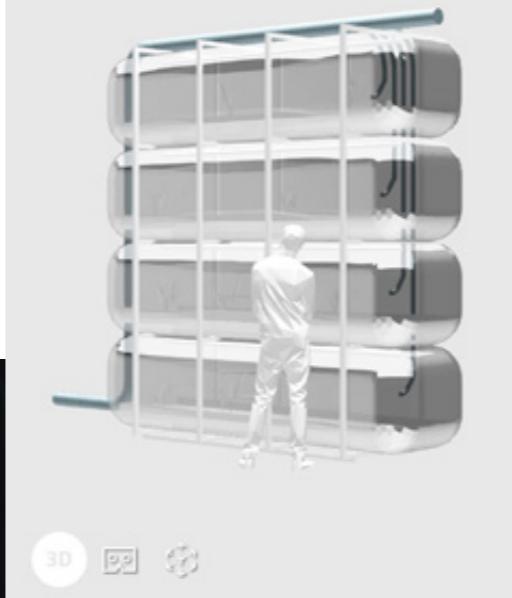
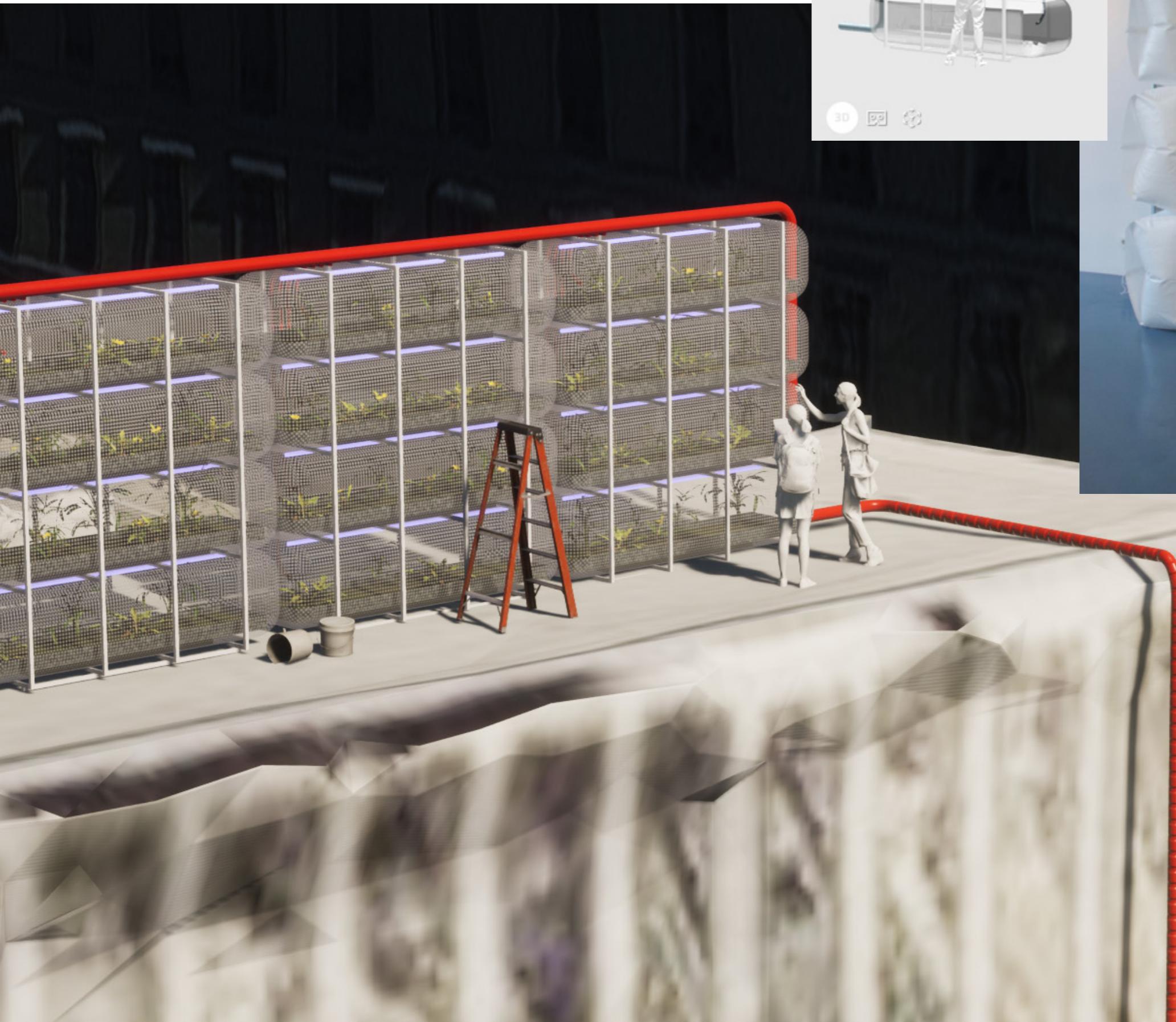
The exhibition included AR models of each construction depicting an expanded version of each construction as a way speculate on future applications.

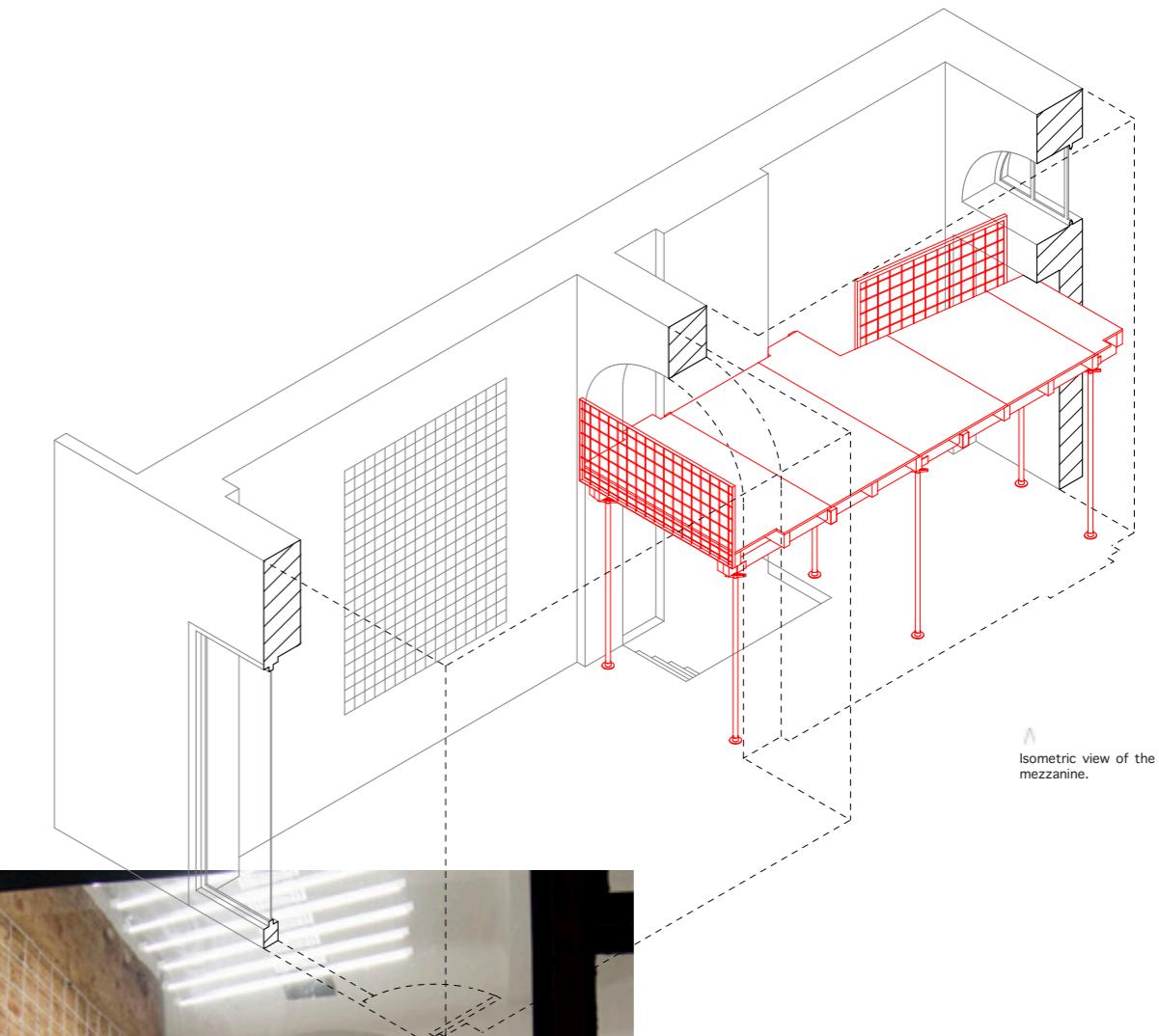


◀ Jurg Conzett's 1999 Traversina bridge: this project served as a reference to test the structural performance of the constructions made using the joynmachine.

Img. Jurg Conzett, 1999







A
Isometric view of the proposed mezzanine.

Project Name: Renovation of a commercial space in Wienerstrasse.

Year: 2021

Location: Berlin, Germany

Status: Under construction

Team: Felipe Monroy (construction), Pablo Silva (renovation works), David Müller (electrical engineering) Pedro Serrano (Architecture, design, management).

Type: Retail

Surface: 65m²

Structure: Scaffolding components, wood, plywood.

For this project I used scaffolding components to create a mezzanine floor that could hold a small office for this store in the heart of Berlin. Six metal columns hold the structure, while six wooden beams are anchored to the walls to provide support against lateral loads. The resulting construction looks extremely light and, combined with an in-built lighting system, it creates a bright and clean space with a contemporary atmosphere.



The mezzanine floor has a 4cm gap that filters light from the ground floor and makes it appear as if it was hovering.

Detail of one of the scaffolding components used in the structure.



The old wooden ladder was restored and repositioned.

Project Name: Casa 10"

Year: 2019-

Location: Villarrica, Chile

Status: Under construction

Team: Pedro Valenzuela (structural design), Claudio Muñoz (Contractor) Pedro Serrano (Architecture, design, management).

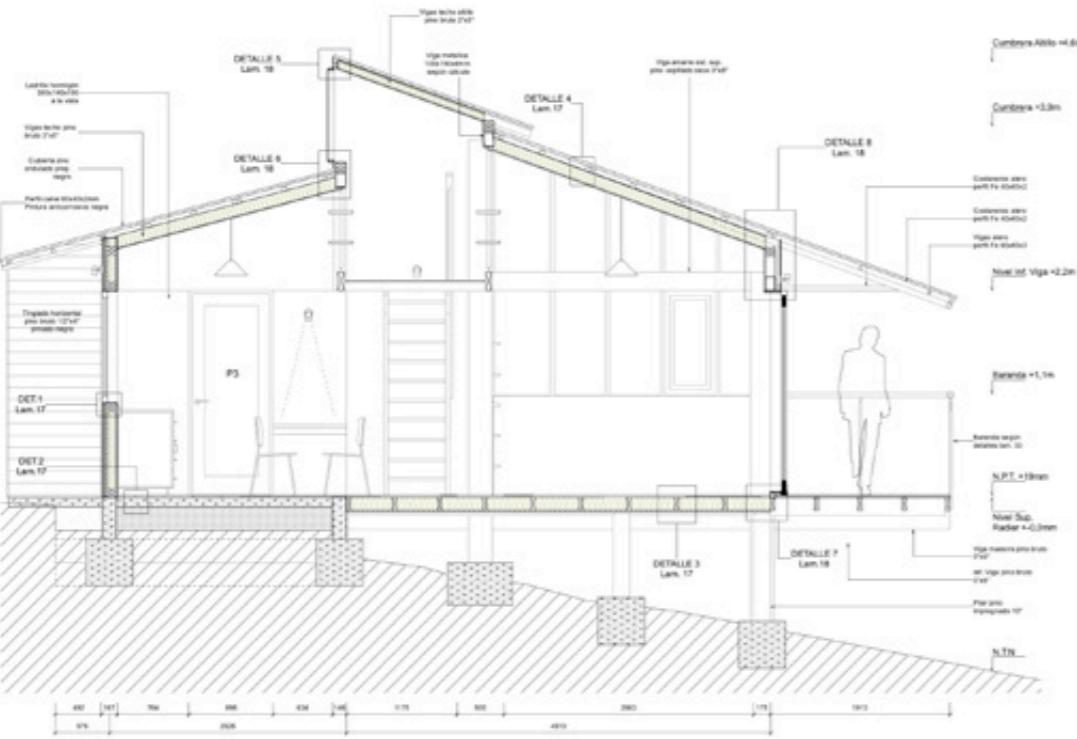
Type: Single family house

Surface: 100m²

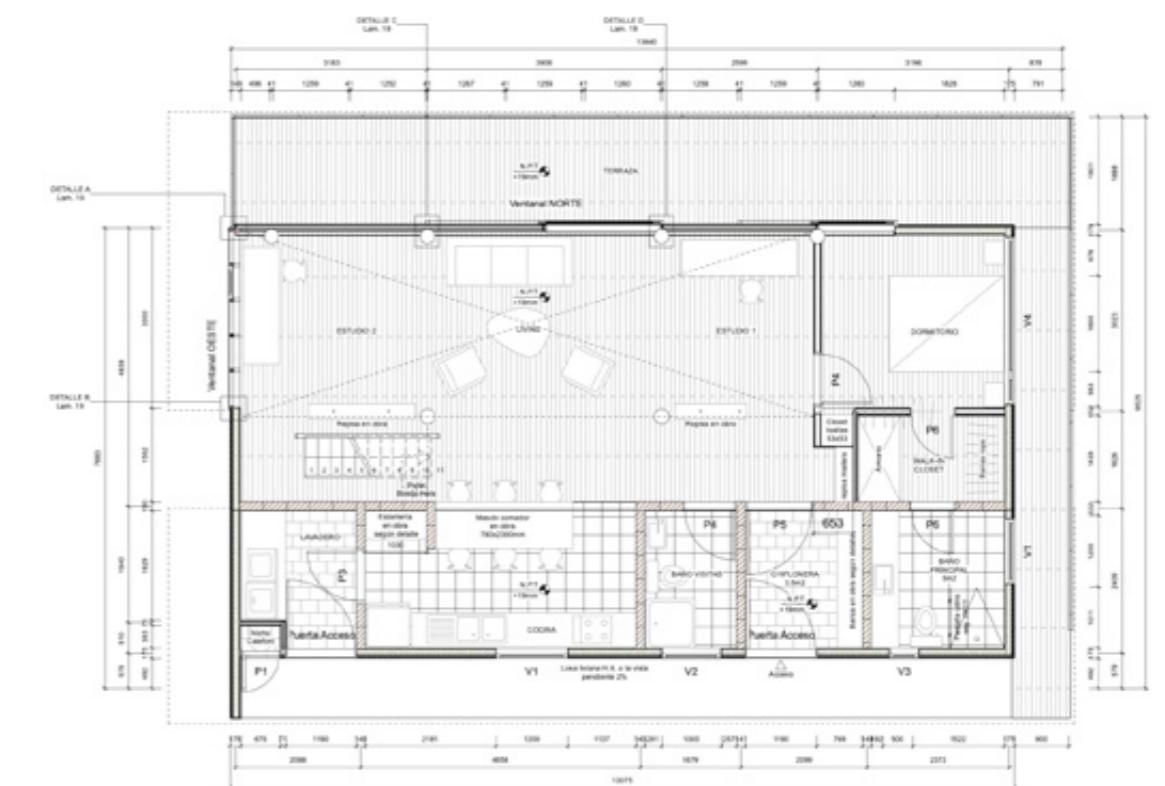
Structure: 10" pine pillars, 8" pine beams.

This small residential project in the south of Chile uses a simple post-and-beam system to create a big open space for the living room, kitchen and work stations. Massive 10" telephone poles were used as columns, to punctuate and organize space without enclosing it. Long eaves protect the house from direct sunlight on the north side, while on the southern side a skylight stretches along the whole length of the house to provide gentle and diffuse lighting throughout the day.





One of the early-stage renderings





Project Name: Prototyping The Future
(exhibition)

Year: 2019

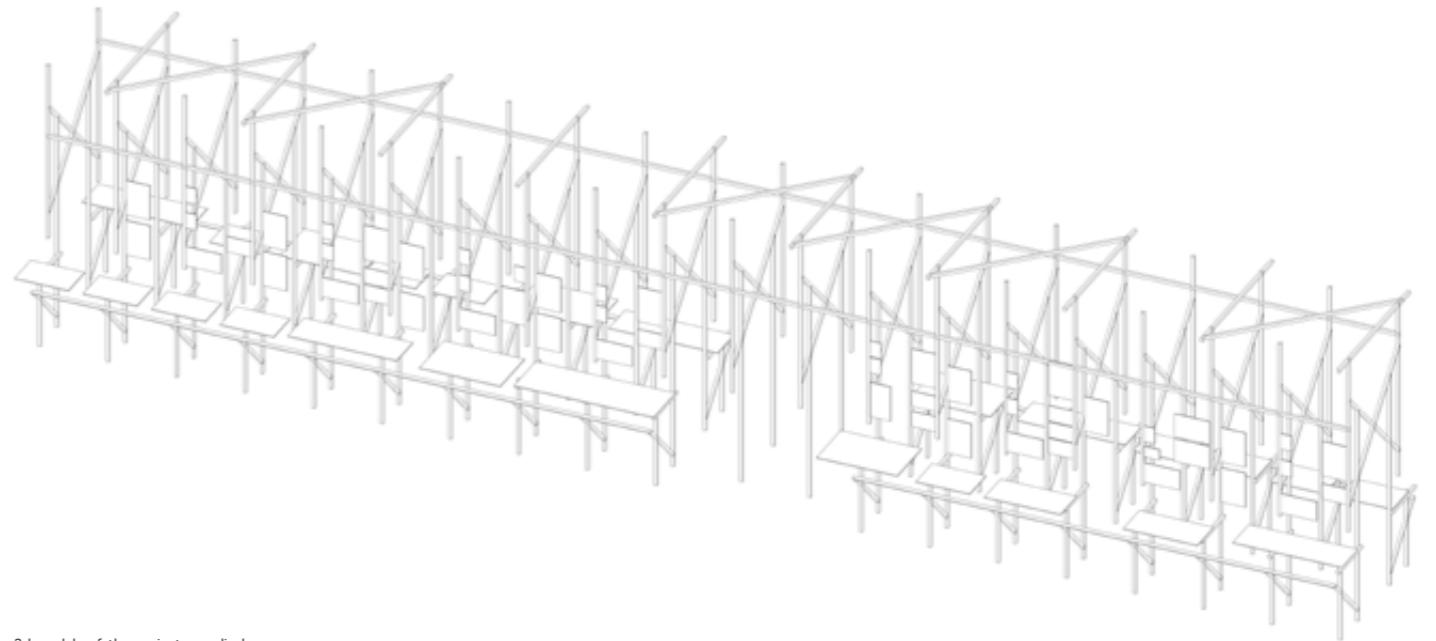
Location: CLB Gallery, Berlin, Germany

Status: built

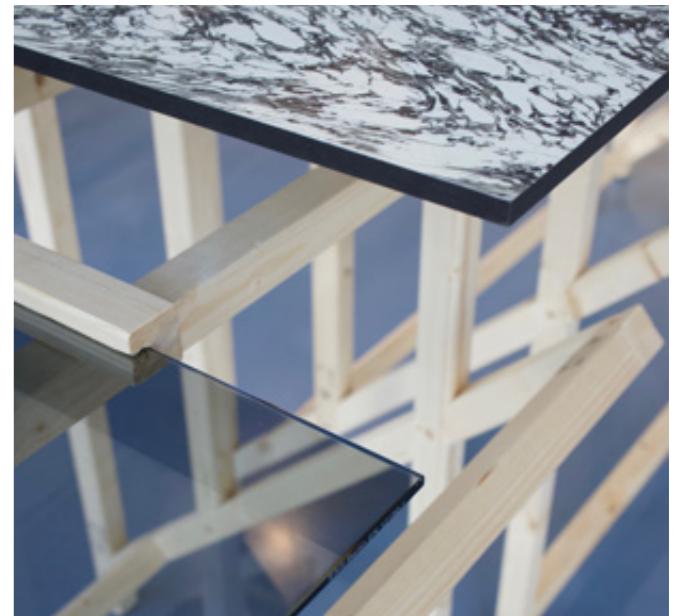
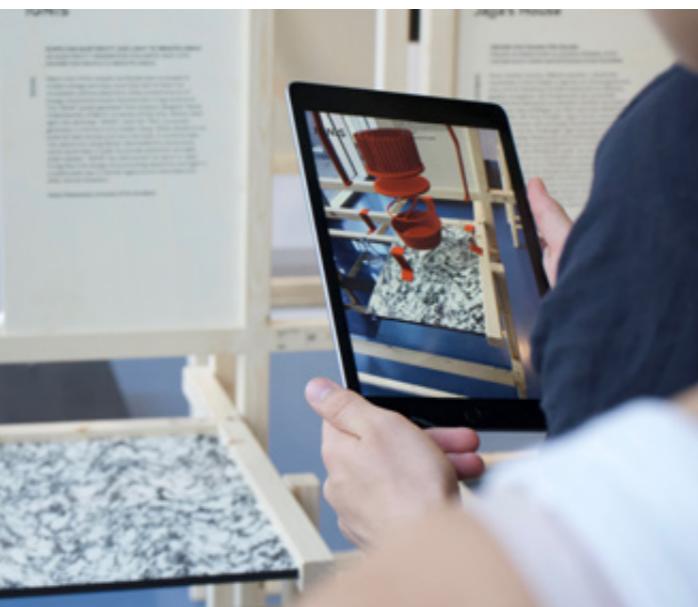
Team: Studio Milz (Simon Deeg and Andreas Picker)(project management, exhibition design, construction), Benjamin Maus (multimedia content, software development), Juan Pablo García (graphic design), Pedro Serrano (support structure design, construction).

A wooden structure was designed to stretch across the room and hold the material of the exhibition. This structure was built with the Join Machine, a milling device developed by Studio Milz that uses information from a 3d model to cut the joints in each individual element. The machine also assigns a code to each part to speed up the assembly process. The exhibition also featured AR content like 3d models or videos visible through the camera of an iPad. Marbled paper was used as a marker to locate the AR content in physical space.

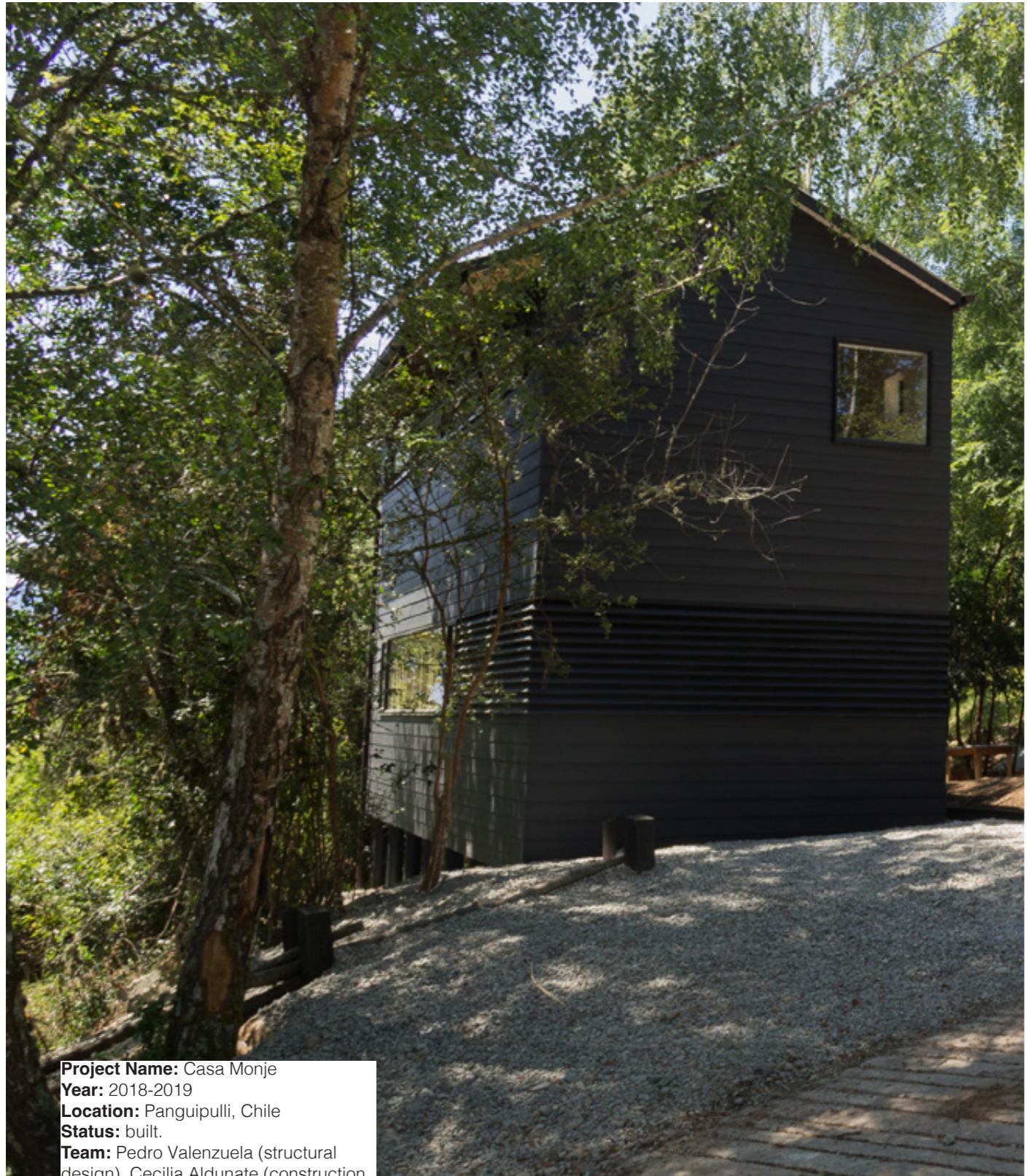




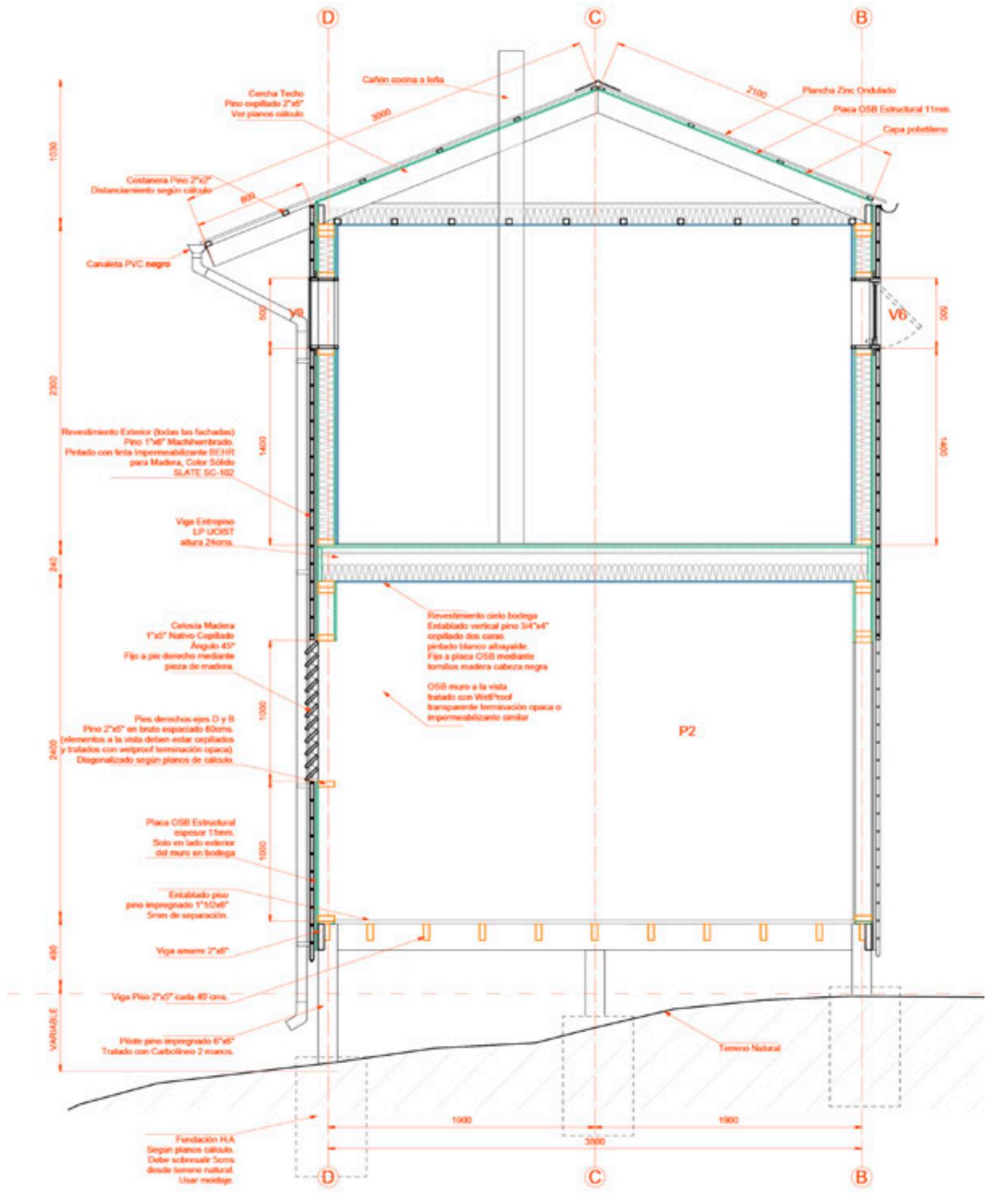
3d models of the projects on display were visible through the camera of an iPad as augmented reality.
19.08.19

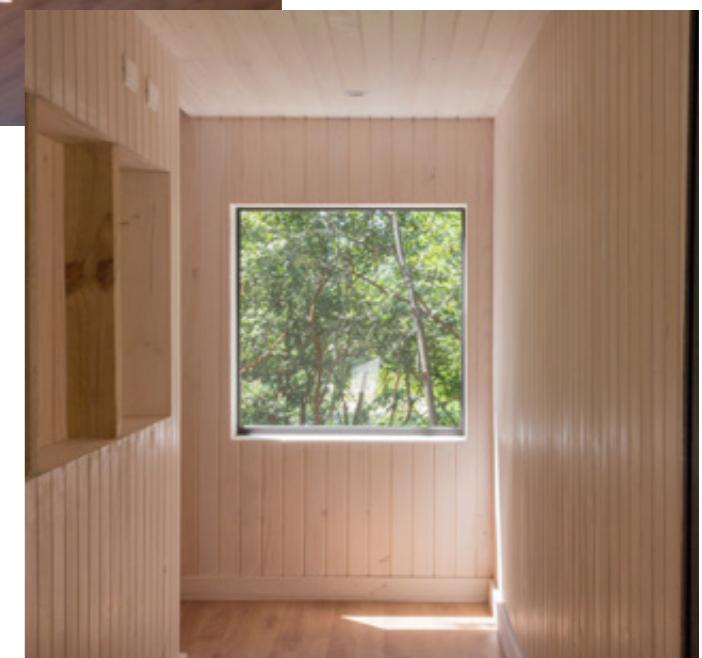
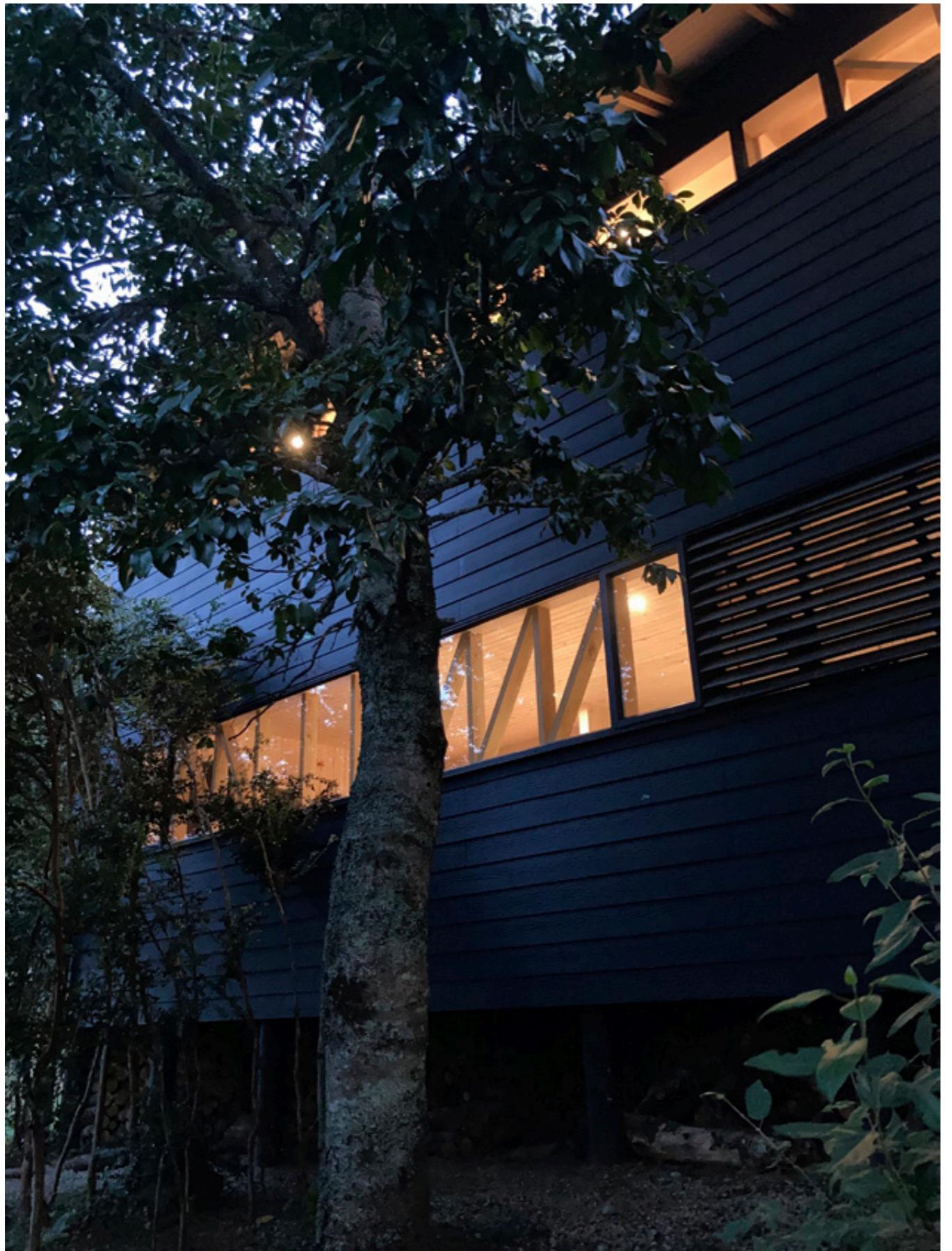


A Bespoke furniture designed for the Vernissage.
19.08.2019

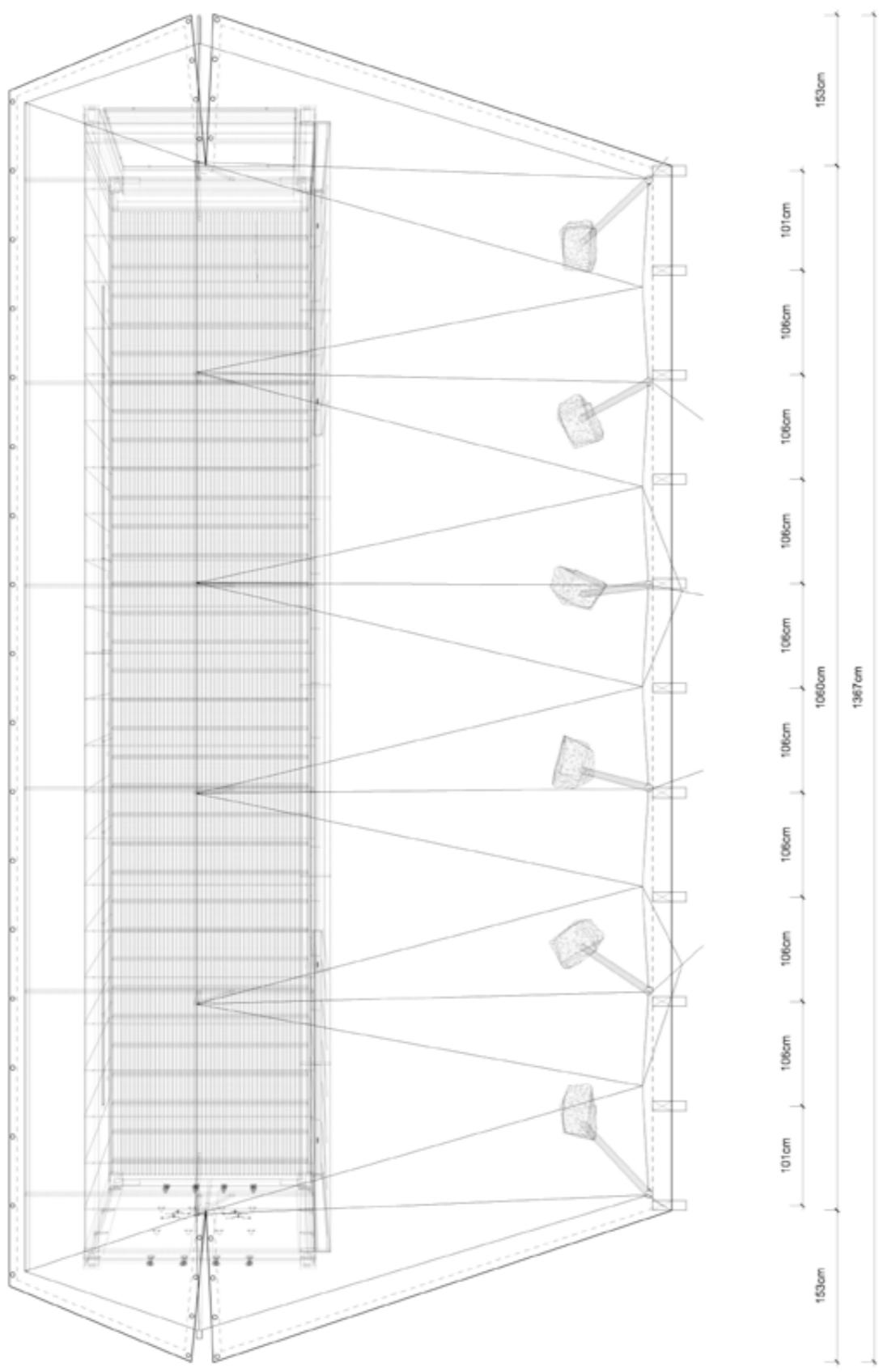


This house sits at the entrance of a rural community in southern Chile. It was designed for a gatekeeper and his or her family. The main feature of the house are its windows. They attach externally through a steel frame, allowing the inner structure of the wall to remain visible. This also allowed for large size windows without compromising the house's structural integrity.





Instagram post #284 @_pepe 24.03.2021:
I designed this house when i was fresh out of architecture school, back in 2017. It was built in 2019, when i had already moved to Germany. I finally got to see it in person for the first time yesterday. It was magic. I remember feeling super unprepared as it was my first time designing anything by myself so i decided to focus on what i thought the house needed most: two really long windows. With my go-to engineer @povalenz we figured out the details of the structure that stands just a few centimeters behind the glass, supporting the house while allowing big openings for light. But when i got there all those details were barely noticeable. The house is surrounded by thick vegetation and is almost impossible to photograph. It sees you but you can't really distinguish its shape. So i decided to wait. And then i saw it. As it got dark and the lights inside the house were turned on it totally changed. It's outline was still hard to make out but the windows shone through the vegetation like two long lines floating in the forest, the structure clearly visible through the glass revealing a warm interior. I felt really happy.



Project Name: Refugio

Year: 2017

Location: Villarrica, Chile

Status: built.

Team: solo project

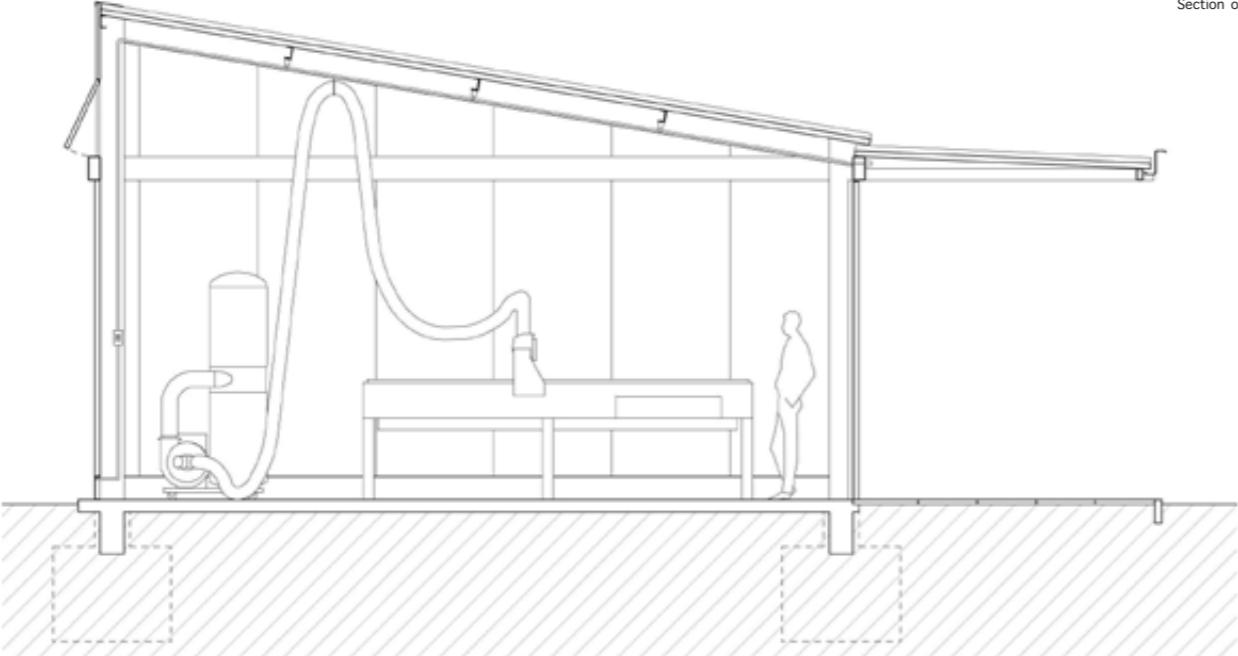
Refurbishment of a 12 meter long reefer container to be used as a retreat in the chilean countryside. The cooling unit was removed and replaced with a square double-layer glass. The stainless-steel- covered walls were polished to reflect more light from the outside. A portion of the front wall was cut out and turned into two sliding doors. These doors connect the interior with an outside gallery covered by a tensile PVC membrane. The poles supporting the membrane use rocks from a nearby river as foundations.



Placement of the pod on site ➤
River rock foundations ✓



Section of the workshop building



Project Name: Machine Workshop Uch.

Year: 2018

Location: Santiago, Chile

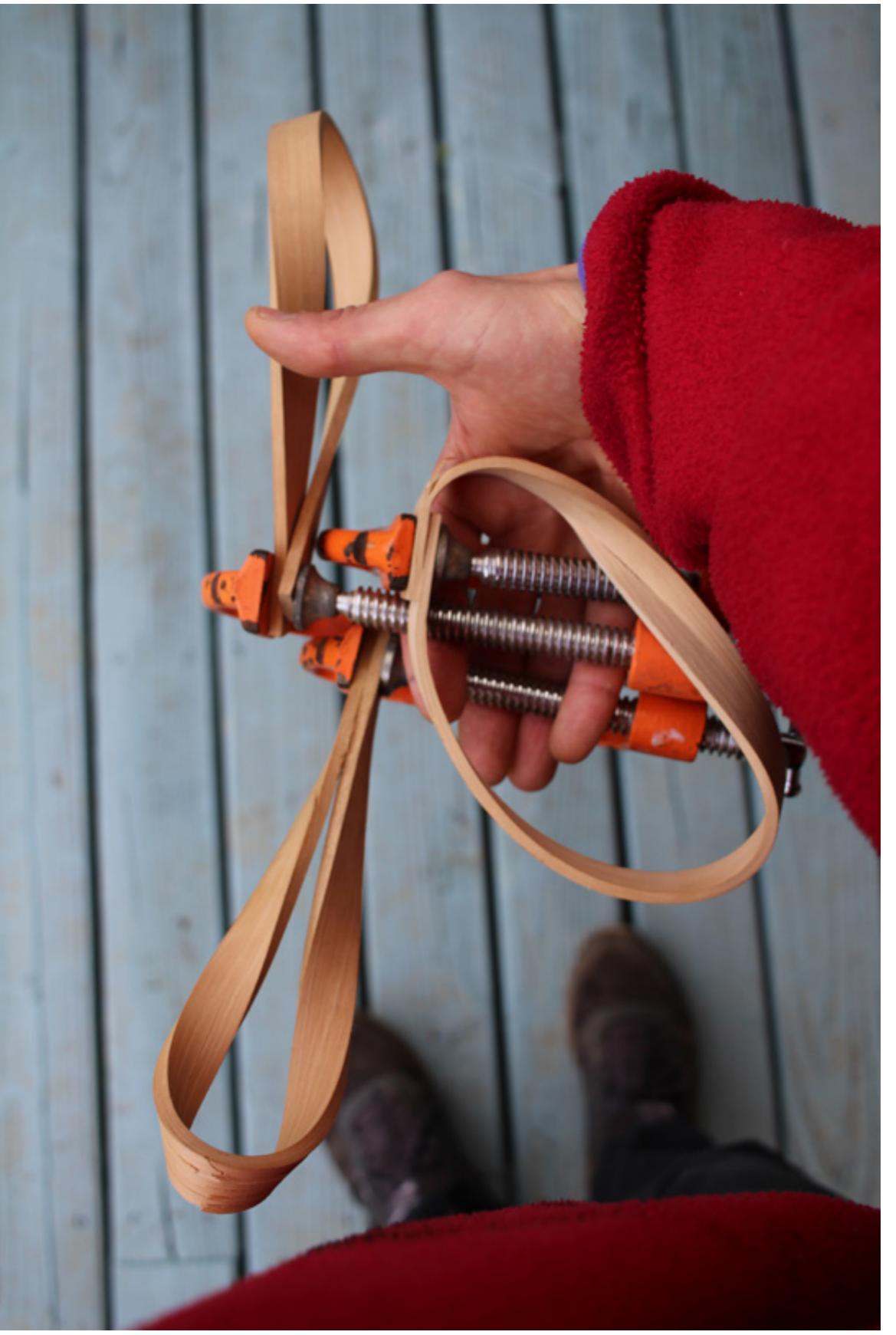
Status: unbuilt.

Team: UMWELT (Arturo Scheidegger & Ignacio García), project management. Pedro Serrano: drafting, detailing, images.

The project consists of a single-story, open plan building to house digital fabrication tools and work spaces for art students. The structure is made of steel profiles and the walls and roof are prefabricated panels. A set of custom sliding doors allows one of the facades to open almost entirely to the corridor and yard. The project also had to deal with the ventilation and extraction requirements of the machines, so special frames were designed to fit between the wall panels so that fans could be installed and extraction hoses fixed.



FABRICATION



▲ Torsion Tests, 2019

Project Name: AC Chair

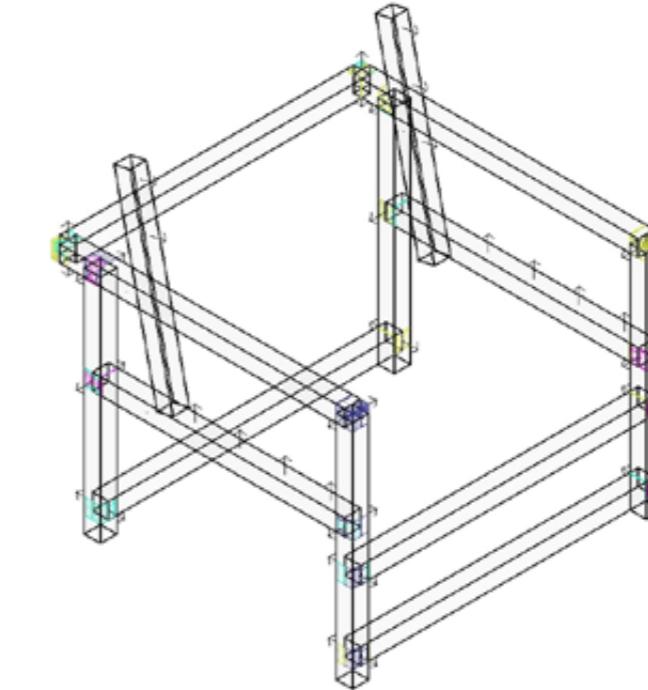
Year: 2019

Location: Berlin, Germany

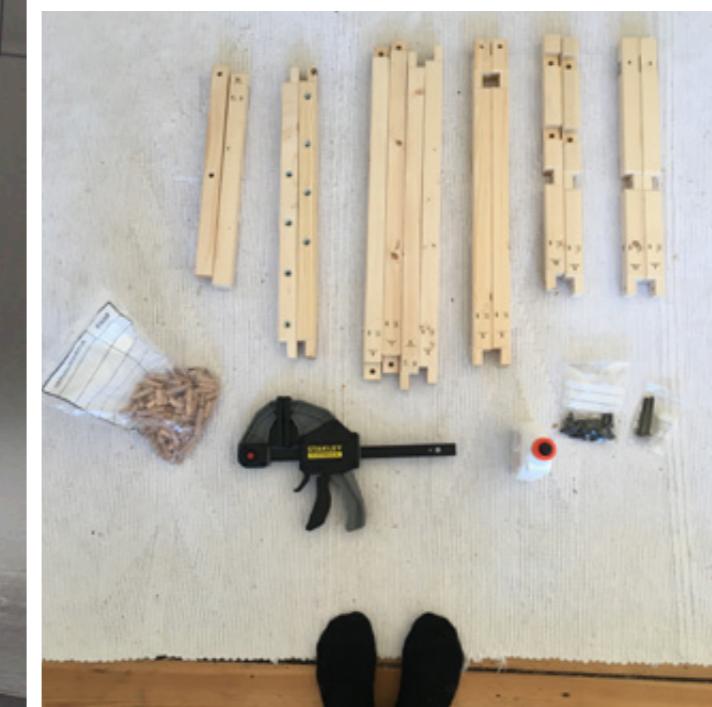
Status: built.

Team: Pedro Serrano (design, fabrication),
Studio Milz (Join Machine).

This armchair is part of an ongoing exploration of the furniture-making capabilities of the Join Machine. For this version we tried to minimize the amount of formal decisions and instead use the properties of the material and the constraints of the tool as guides to meet the requirements of the project.



Grasshopper-generated 3d model for milling

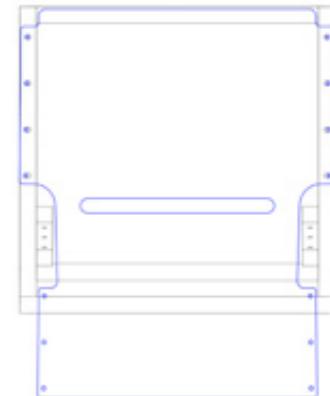


Armchair building kit.





The first iterations of the chair use a single layer of high density synthetic felt for the backrest and seat. For the latest version (left) i used natural wool felt with padding and stitching to increase resistance around the anchor points.



CAD drawing for laser cutting of the felt seat.





Project Name: Spotlight Tripod (Moon Phase)

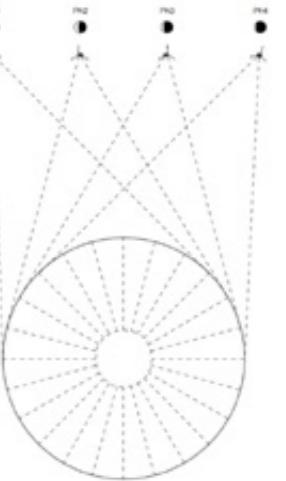
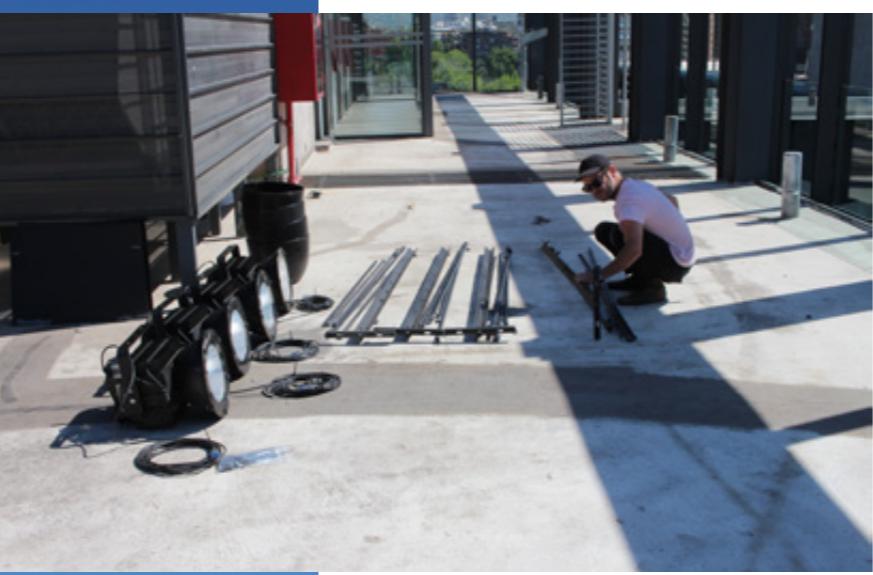
Year: 2018

Location: Santiago, Chile

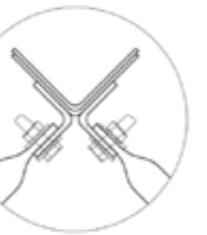
Status: built.

Team: Javier Toro Blum (Concept, management), Catalina Harasic (Lighting), Pedro Serrano (Design, technical development).

A black inflatable sphere 8 meters in diameter was mounted on top of a building in downtown Santiago. The sphere was illuminated at night by four high potency LED spotlights mounted on custom built steel tripods. The lights were turned on one by one in a loop. Each stage simulated a phase of the moon's monthly cycle. The project sought to bring a planetary phenomenon into an architectural scale.



▲ Lighting sequence for the installation



▲ Tripod detail section



Project Name: Woodworking

Year: 2016-2017

Location: Villarrica, Chile

Status: built.

Team: Esteban Serrano, Pedro Serrano

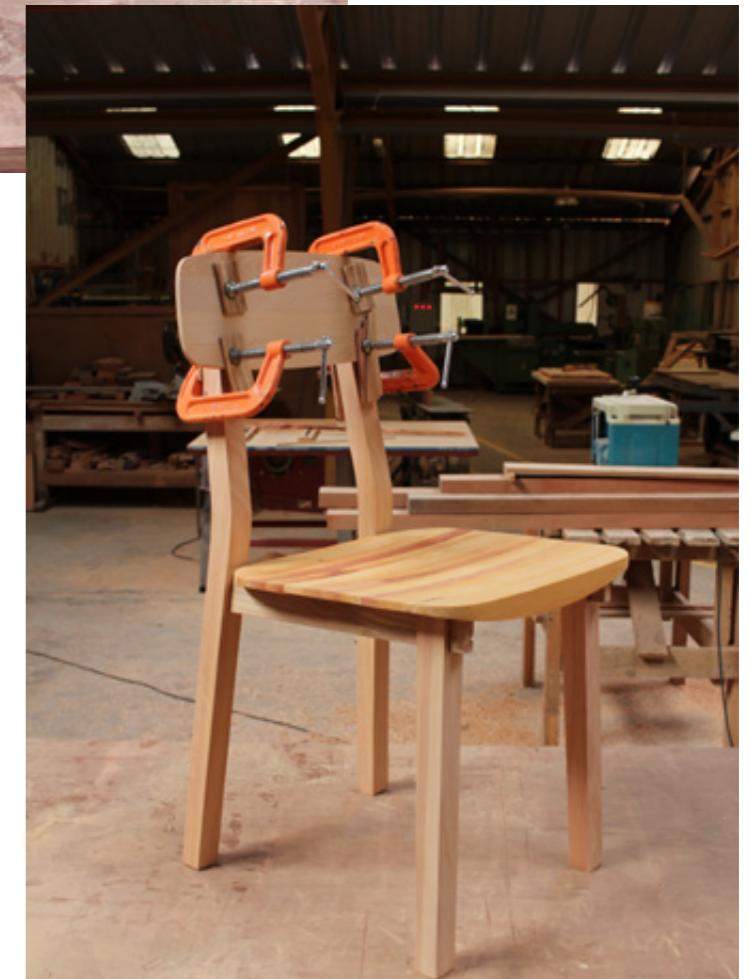
These pieces are the result of a series of exercises in furniture design and manufacture developed between 2016 and 2018. In all of them i try to understand the task of producing the object as an abbreviated form of architecture project. Just like a house or a skyscraper, the chair has specific structural and formal requirements that have to be met with a given technical capacity and budget. In the same form, these pieces of furniture seek to have the most resistant shape possible while using the least material and a reduced set of machining operations.

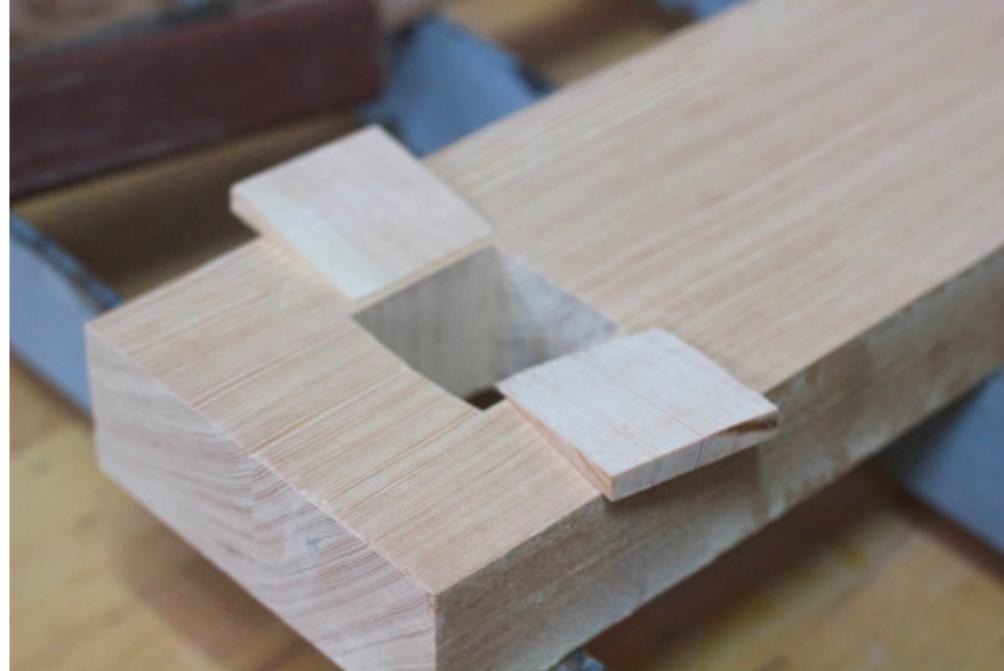


 MDM1 Chair 2016.



 MDM2 Chair 2017.

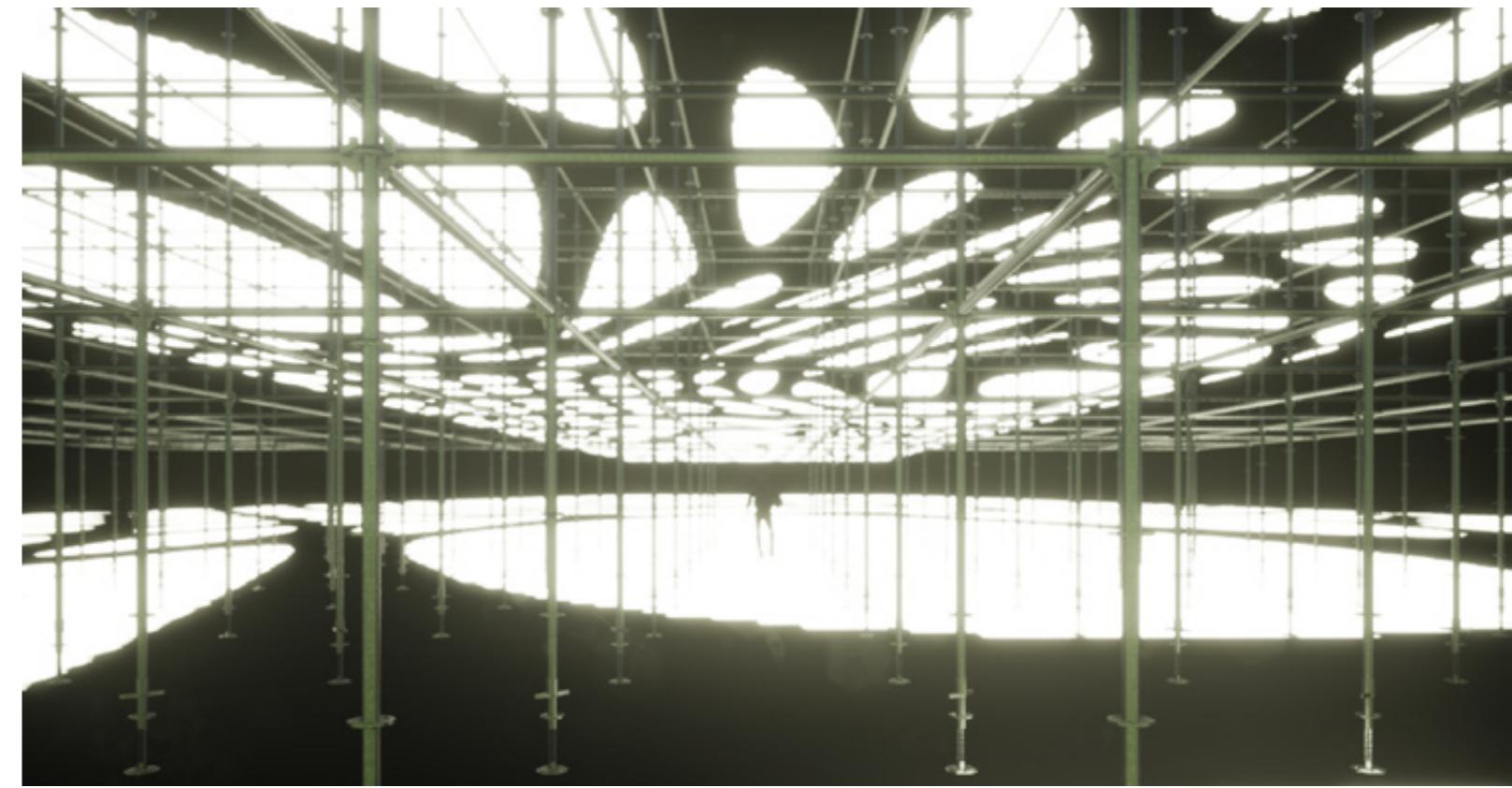




< VAKUUM mini furniture series 2017.



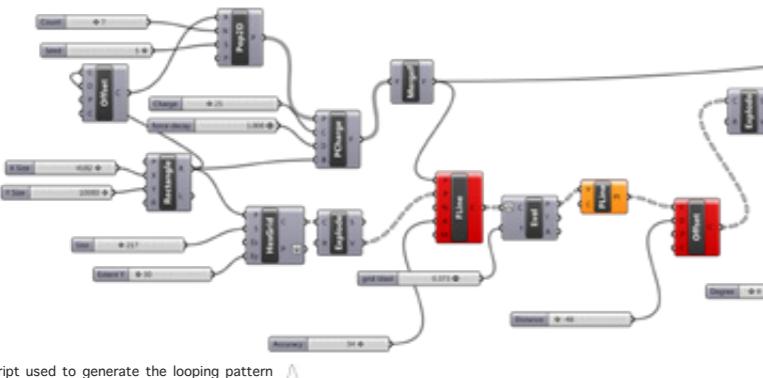
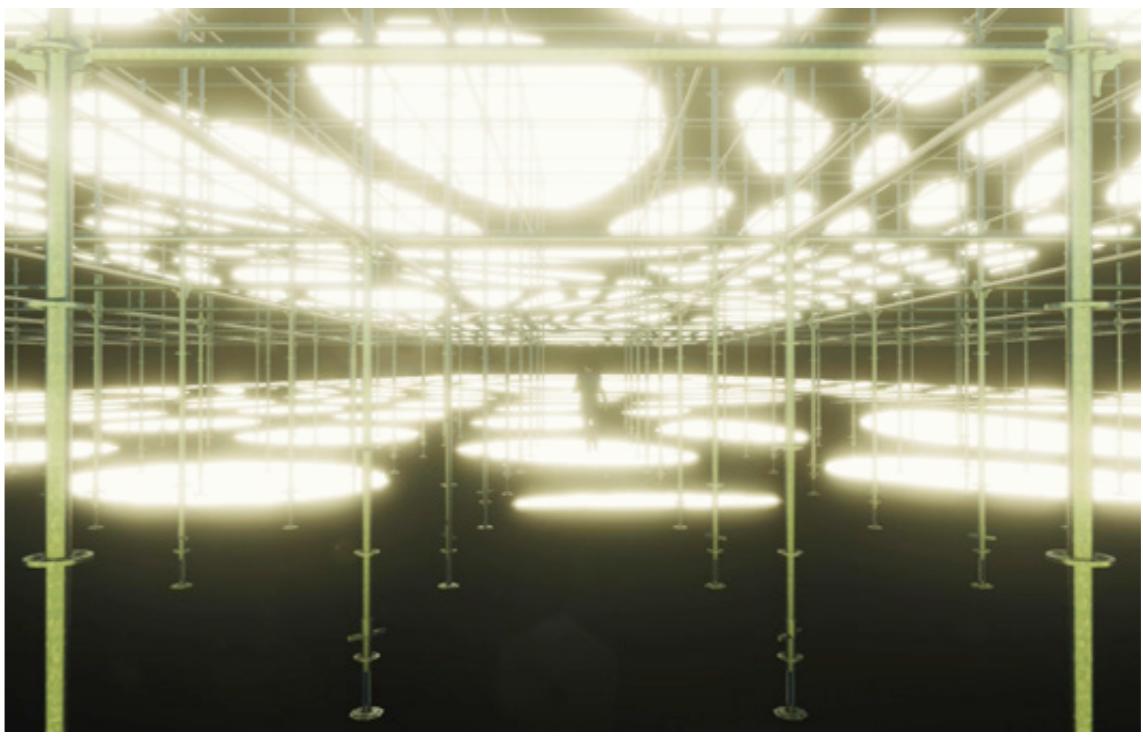
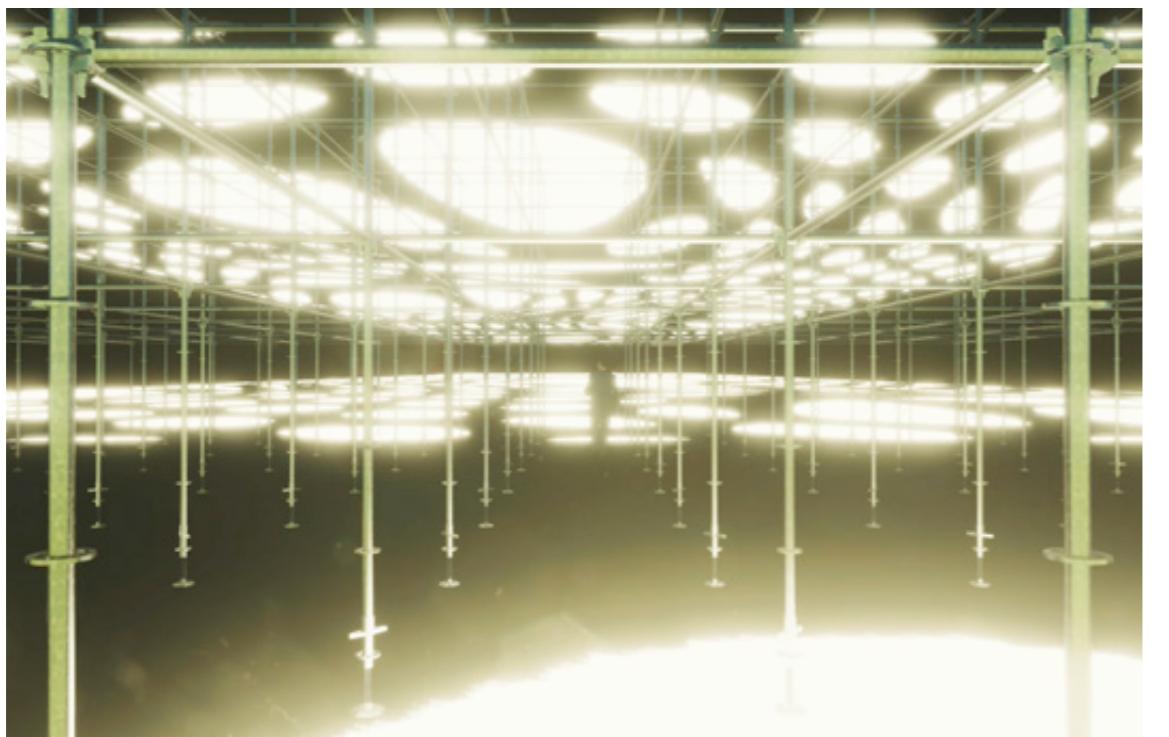
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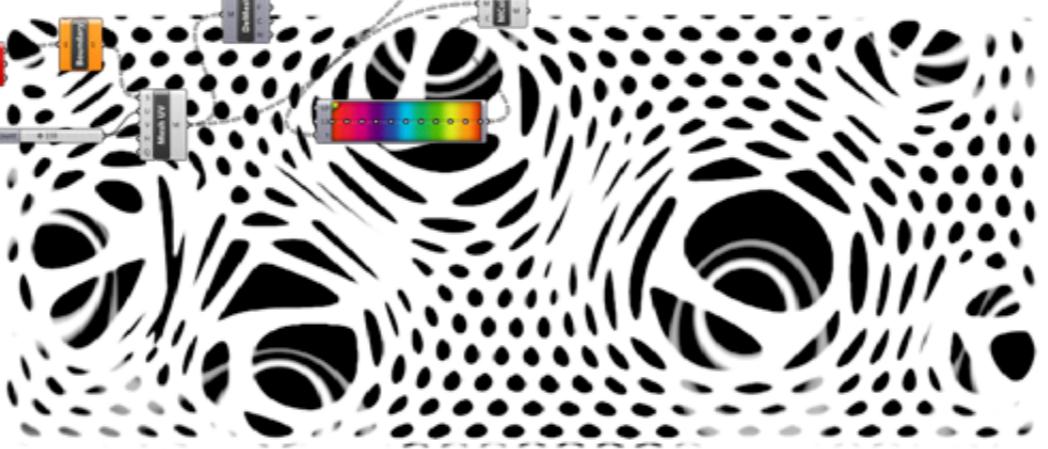
▲ Hyperspace: a short animation inspired by the final scenes of Stanley Kubrick's 2001: A Space Oddyssey. (2020)



Stills of Hyperspace. ➤

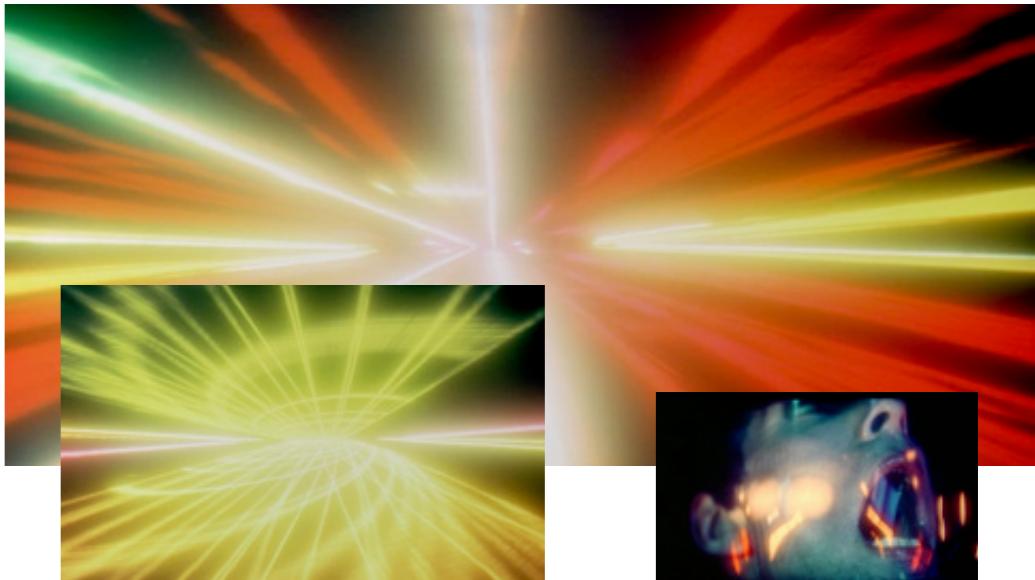


Grasshopper script used to generate the looping pattern A



Looping pattern ➤

▽ Stills of the original movie





A Interior visualization and object design for Minimals' store in Berlin - Prenzlauerberg (ongoing project)





◀ Renderings for the communication of the exhibition concept (Assembly Strategies, CLB Berlin, 2022).

