2022 Portfolio

Georgios Grigoriadis

Portfolio

Georgios Grigoriadis
Designer, Architect

Master of Design, UC Berkeley
Dipl. Architect Engineer AUTh, Greece

Georgios Grigoriadis is an Architect of Things.

He uses this term with great vagueness as he tries to consider Architecture as a bigger sum of things, not only building production. Architecture as a tool for critical thinking on living and the future. Drawing back to history he is intrigued by moments that redefined or proposed something that resembled a model of living. His work seeks to engage with the notions of curiosity and impact. Curiosity as the constant movement upon media, scale and disciplines. Impact as the moving force for mindful and solution entropy design for a complex world.

He is an Architect, Designer, Maker, Creative technologist, World and Word Builder, Perpetual Learner and finally, a Generalist.

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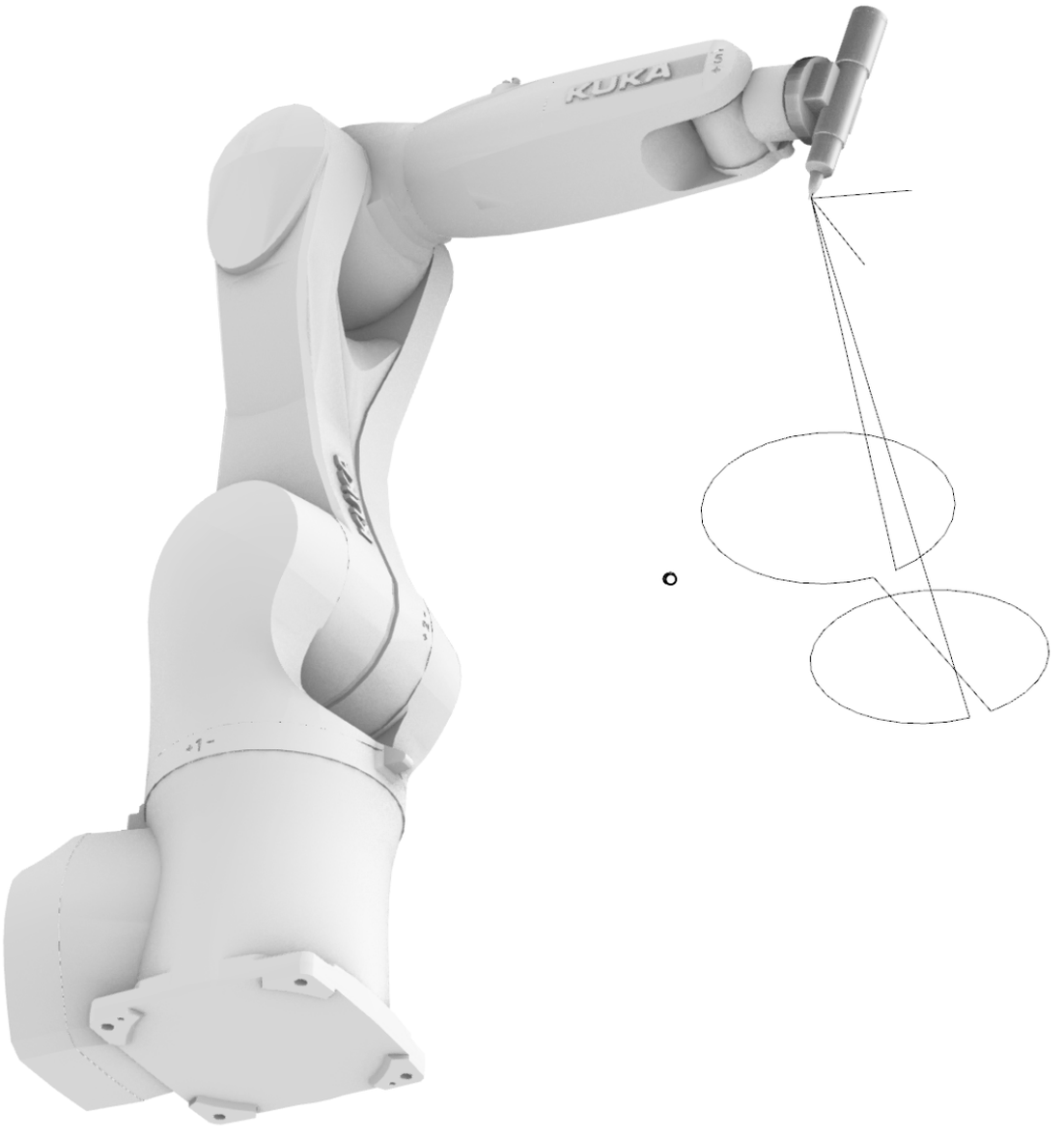
Sympoiesis

(Work in Progress)

Georgios Grigoriadis

Spring 2022

Design Thesis
UC Berkeley Master of Design (MDes)
College of Engineering
College of Environmental Design



Abstract

Sympoiesis
Robotics as design material

Current implementations and research around robotics focuses heavily on specific tasks that make use of what robots are actually impeccable at doing: being precise, repetitive and strong. Although this has been essential in industry, this thesis argues that there is more to robotics through the exploration of a richer symbiotic paradigm between robots and humans. This thesis starts from a fascination about robots as multipurpose tools in industry and moves beyond that. It draws inspiration from older and contemporary precedents and works where robotics are considered a new medium to explore. Focusing on the works of the late 20th and early 21st century, it traces the trajectories of works that take the form of installations, experiments, research projects and art performances.

In this project, a KUKA KR6 R900 industrial robotic arm is used as the main platform of the interaction. The robotic arm is equipped with a custom toolhead that holds a series of sensing and actuating mechanisms to assist in a co-creative drawing experience. The movements and actions of the human are analyzed as vocabularies of geometrical elements and act as input to the robot to interpret them and respond through movements and drawing gestures. As an initial iteration of this project, the interaction between robot and human is curated around a version of the design concept game, Silent Game (Habraken, 1987) and a series of short planar drawing exercises.

The first iteration of Sympoiesis is deployed as an interactive installation where individuals with and without prior design experience get to participate in these short drawing games with the industrial robotic arm. After participation, a short session of discussion and evaluation between participants and observers follows. These design concept games are intended to conceptualize aspects of the design process and introduce the machine as an actor in this system. They are perceived more as a research tool to explore the interaction between humans and machines.

From the computational machines of Architecture Machine Group and the machine theater of Survival Research Laboratories, all the way to the delicate interactions of the ATONATON and Sougwen works, this thesis aims to explore the in-between spaces of these important propositional works of what constitutes machine poetics. The notion of exploration and accident, the love of apparatuses in humaine making operations. As human-machine interactions become more ubiquitous, Sympoiesis explores the fringes of this relation, the dialogue between the human and the machine, their divergent interpretation of prototypes, and finally the teaching and learning that will occur on both sides of the creation table. Sympoiesis aims to contribute to, and initiate a conversation, on the intriguing, and yet unexplored field of robotics as design material.

stud.io

David Zhou
Julia Park
Kailin Li
Titus Ebbecke
Georgios Grigoriadis

Spring 2021

stud.io is a projector that transports the collaborative spirit of art studio into your own home. The intention was to address the notion of “remote tangibility” in an era where creative instruction and co-creation were limited and impacted by the pandemic.

stud.io is a projector that transports the collaborative spirit of art studio into your own home.

Social Separation

Screen Fatigue

Remote Work

Working, learning, and existing remotely is hard. stud.io as a concept stems from the motivation to address this problem by introducing tangible interactions into a remote creative workflow.

User Research and Findings

We interviewed several users from different creative fields that found remote work and instruction challenging. Their shared perspective was that remote creation and the pandemic added challenges for instructors and learners to check in with each other given there's just one flat, vertical screen staring in your face. They all concluded that remote work needed to be more intentional, putting in more effort to connect and create together. These insights were the starting point for us to start prototyping ideas and create stud.io.

Quotes

"Clay is a recorder of the body - how do you show that?"

"There's no incentive for students to try hard if they can't see others working."

"Handwriting is distinctive. Only he has that handwriting"

The things they miss from studio

Passive Presence

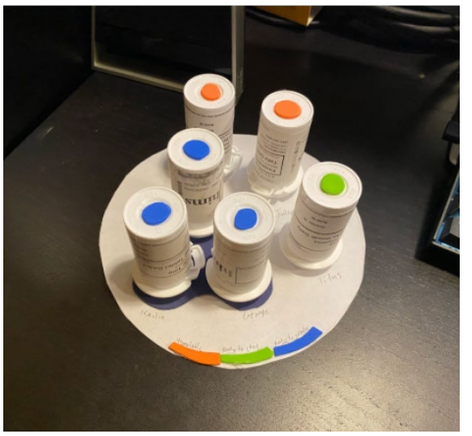
Spontaneous Interaction

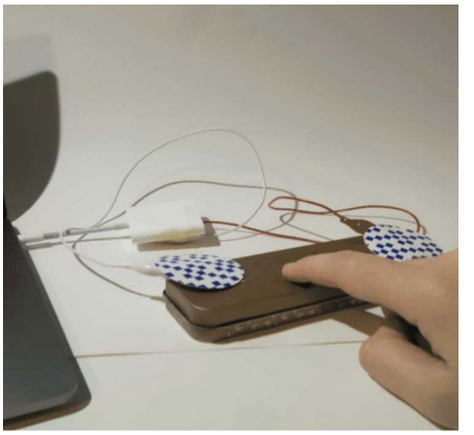
Shared POV looking at projects

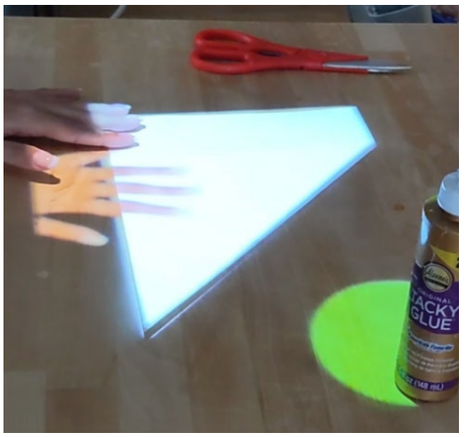
Prototyping

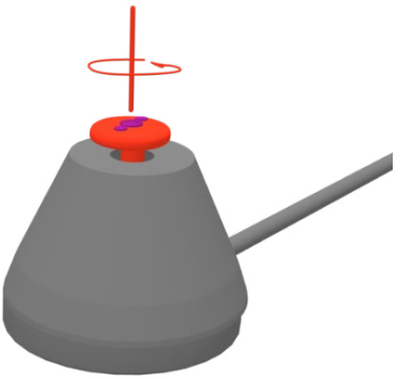
stud.io was developed by a remote team. We prototyped several ideas that we believed could address the notion of remote tangibility and tested them with external users and within our group.

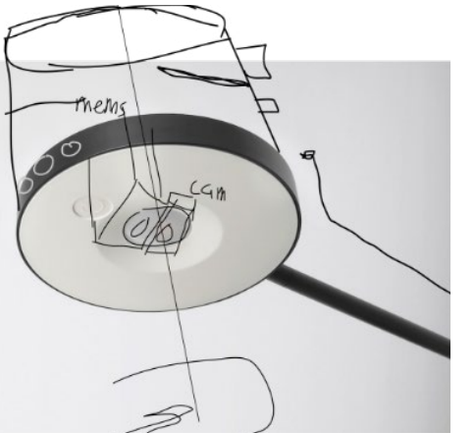
We discovered that the use of projections on a shared working surface could help bring back notions of the collaborative spirit of a studio.











Hacking / Final Assembly

Our device needed to be easily relatable and familiar as an object that lives in a home or creative space. We considered and finally chose to hack an IKEA YPPERLIG floor lamp and add the needed components to create a device that augments the workspace and remote co-creation process.

LED Buttons & Dial

Mute microphone
Toggle collab mode
Toggle works session mode
Adjust volume

Enclosure

3D Printed
Heat venting
Audio pass-through

Raspberry Pi

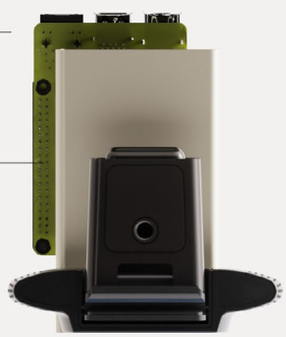
Cricket Hat
Wired to buttons & dials

MEMS Laser

Microscanner projector for masked projections

Webcam

FHD Webcam
Microphone



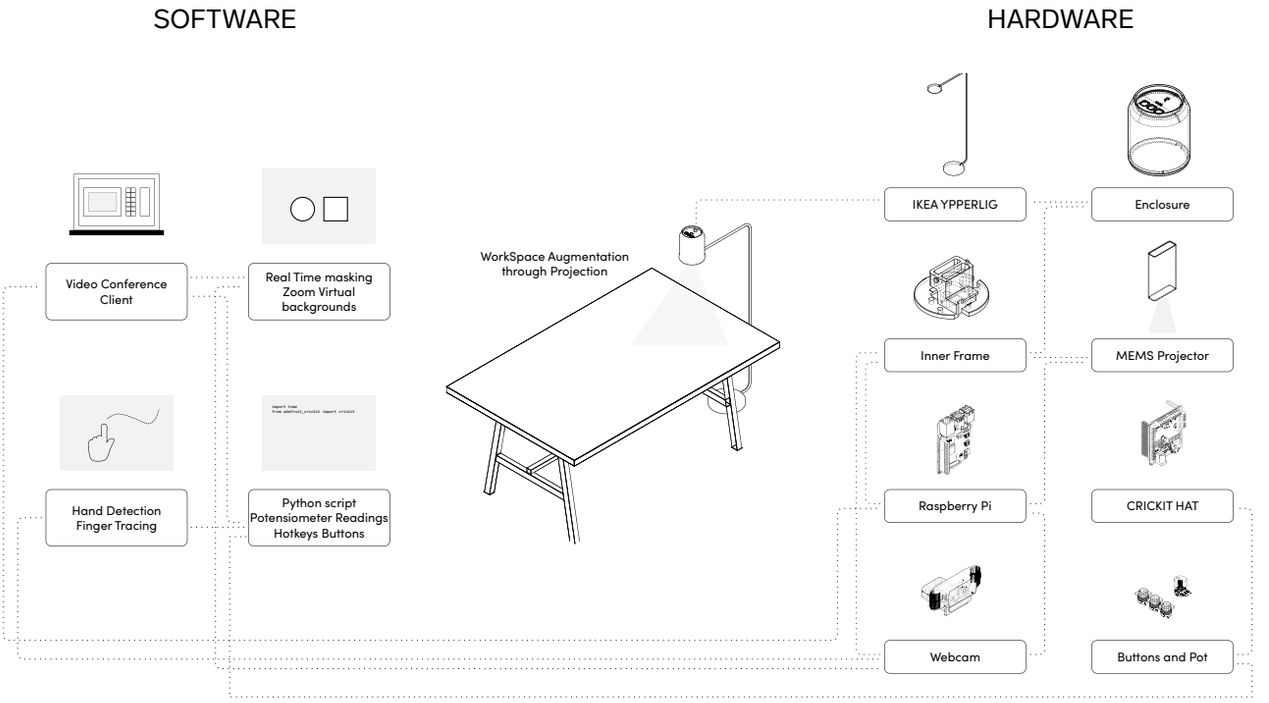
Inner Frame

3D Printed
Mounts above components

Stand

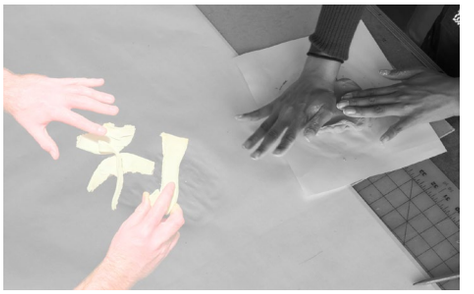
Hacked from IKEA lamp
Routes power cable
On/Off switch

System Architecture



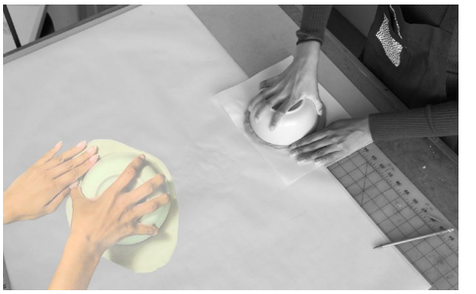
Get instructions from experts

stud.io allows for intuitive step-by-step instructions while you are working on a specific task or technique. The combination of audio live call and projection on the working surface of the expert hands and gestures allows for an immersive instructional experience.



Work next to peers

Being remote really had an impact on the collaborative nature of studios and creative spaces. With stud.io every student or creator has the opportunity to project and be on a call with their peers. In that way they can brainstorm, show and tell and co-create together.



Follow along in real time

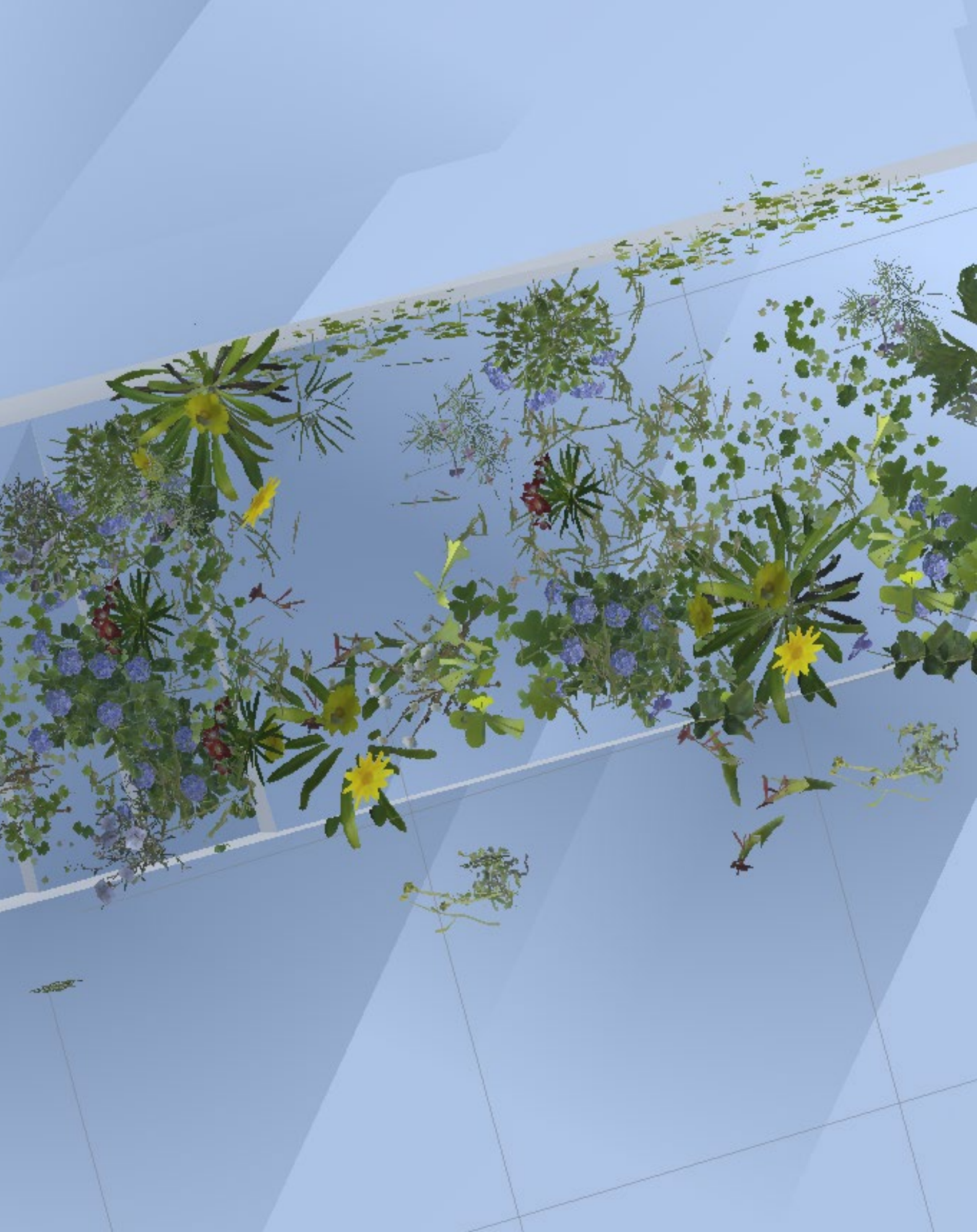
In all cases, stud.io allows for concurrent remote interaction. Students, instructors and creatives can share techniques and workflows in real time with others. This allows for a fluid hands-on interaction where some of the limitations of remote physical creation are addressed.

Flora Ephemera

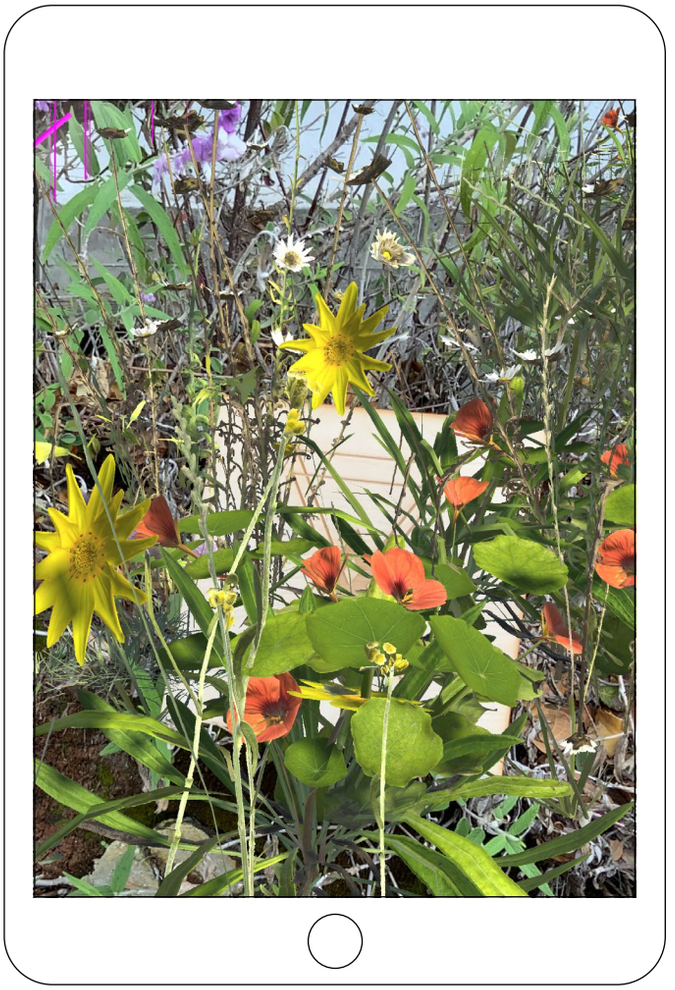
Abhi Ghavhalkar
David Zhoud
Effie Jia
Georgios Grigoriadis

Fall 2021

An augmented garden experience



Augmenting Public Space



Berkeley has a network of public paths, steps, and walkways that are removed from the bustling world they exist within. Though they can be natural reprieves from the pace of modern life, people primarily use them as a shortcut to get to public transportation, shopping districts, and schools. Flora Ephemera is a digital experience that uses augmented reality to help passersby slow down and enjoy the gorgeous, green corridors created by the Berkeley Pathwanders' Association.

The augmentation technology spawns flora native to the region at a rate that corresponds to the speed at which the user traverses through the space. Flora Ephemera's experience begins at the bottom of the steps and progresses as the user ascends the stairway. The program is designed specifically for a 21x21x21-foot space within the Hill Court Steps that connect Le Roy Avenue to Hill Court in the North Berkeley Hills.

Flora Ephemera is experienced through an iPad device. It consists of an AR Unity application developed in Unity MARS. For the revealing of the experience users scan a physical image marker that unlocks and initiates the augmented garden.

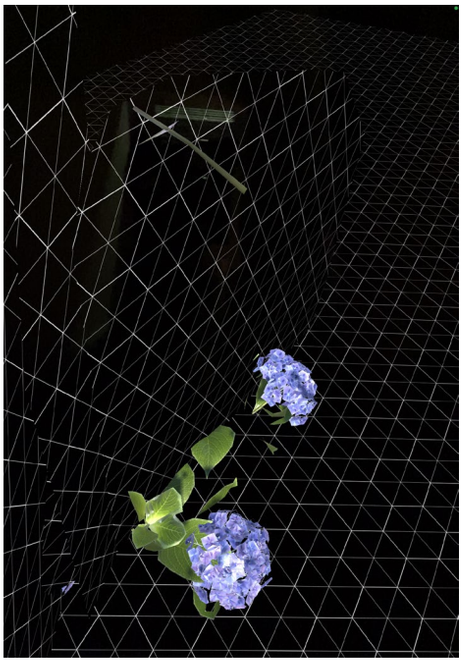
37°52'48.1"N
122°15'37.0"W
Berkeley, California

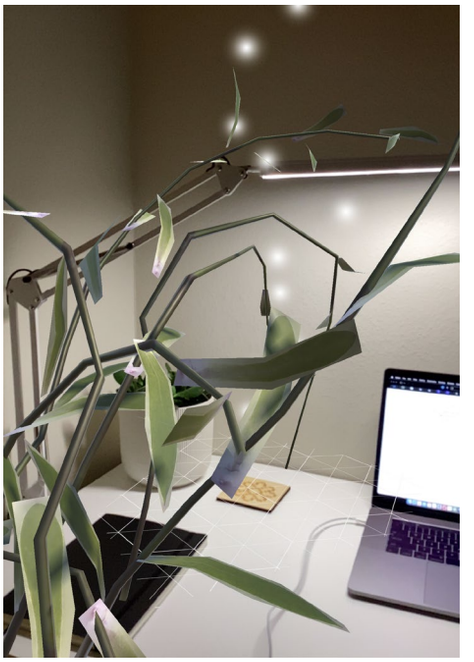
Behavior / Intention

For our project, we wanted to subvert this status quo of efficiency and speed. We wanted to develop an app that would encourage passersby to slow down and enjoy the beauty of the site. If they do so, the app responds by blooming digital flora in the augmented space. If they rush instead, then the digital flora will wilt.

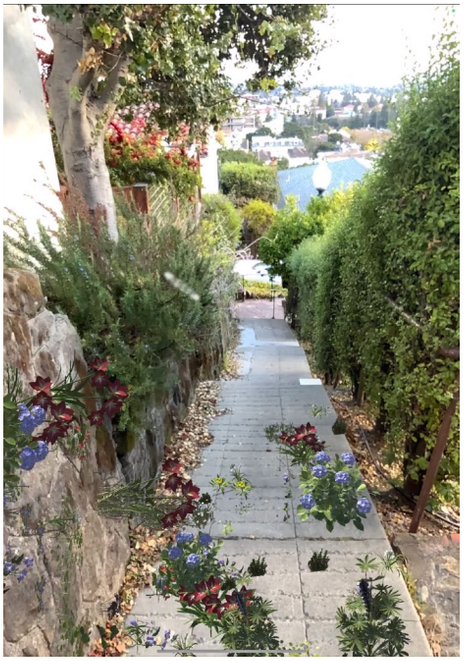
To achieve our intented experience, the app needed to:
- Sense real-time speed of the user
- Dynamically change the scale of our virtual plants

Flora assets testing

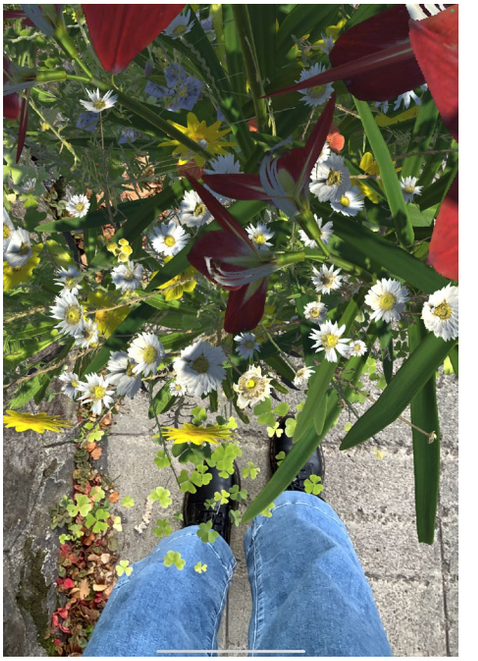




If you rush, Flora wilts



If you slow down, Flora blooms



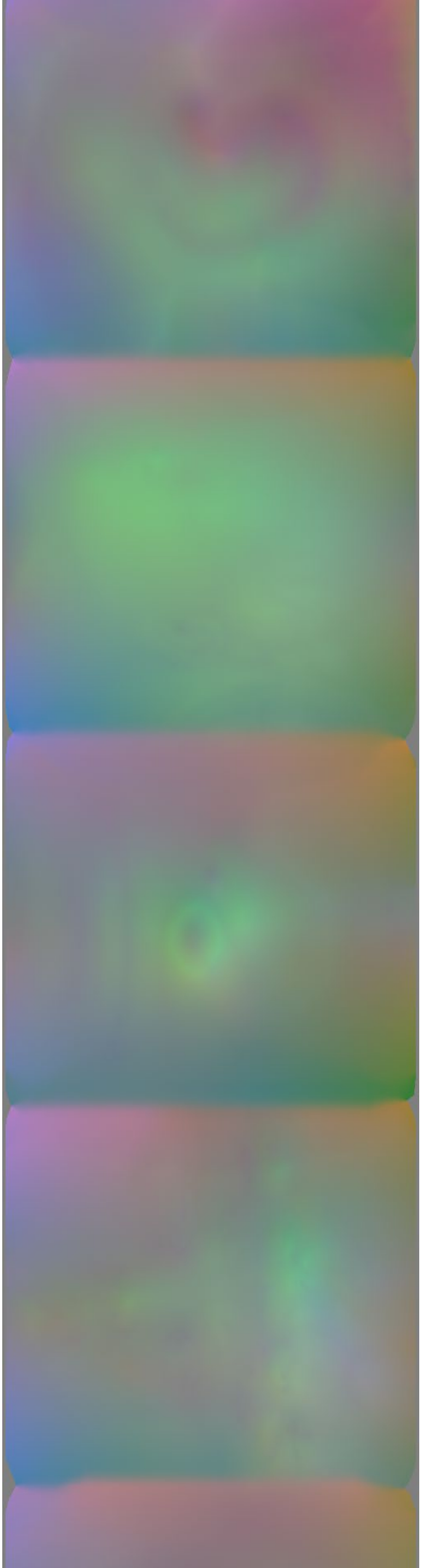
Hillcourt Steps / Augmented garden

Artificialis Rilievo

Kyle Steinfeld
Titus Ebbecke
David Zhou
Georgios Grigoriadis

2021

GAN-generated architectural sculptural relief



Generation Pipelines

Artificiale Rilievo is a work of architectural sculptural relief produced by a generative adversarial network (GAN). The project explored novel methods developed for the generation of three-dimensional sculptural designs using a pseudo-3d description of form based on vector displacement maps (VDMs). By expanding the range of possible forms, the project suggests broad application in ornamental architectural design. Conceptually, the artistic work described brings tiling geometries found in contemporary architectural ornament into dialog with forms drawn from the Western architectural canon, and reflects on the dataset as a retrograde influence in the therwise avant-garde field of creative AI. Negotiating the “uncanny” boundary of individually-recognizable forms within a differentiated field, the piece materializes an animated walk through the latent space of a GAN in the solidity of cast bronze.

Artificialis Rilievo was presented at the 2021 Venice Architecture Biennale as part of the X Venice Italian Virtual Pavillion. The work was directed by Professor Kyle Steinfeld.

Left: Rendered image of the result geometry
Right: Vector Displacement Map of Double Hex

A Pipeline for Representing 3d Sculptural Relief as Raster Data

1. Pergamon Altar Meshes
We used 3D scanned parts of the frieze of the Pergamon Altar, a ancient Greek temple. These sample polygon meshes acted as the initial dataset.

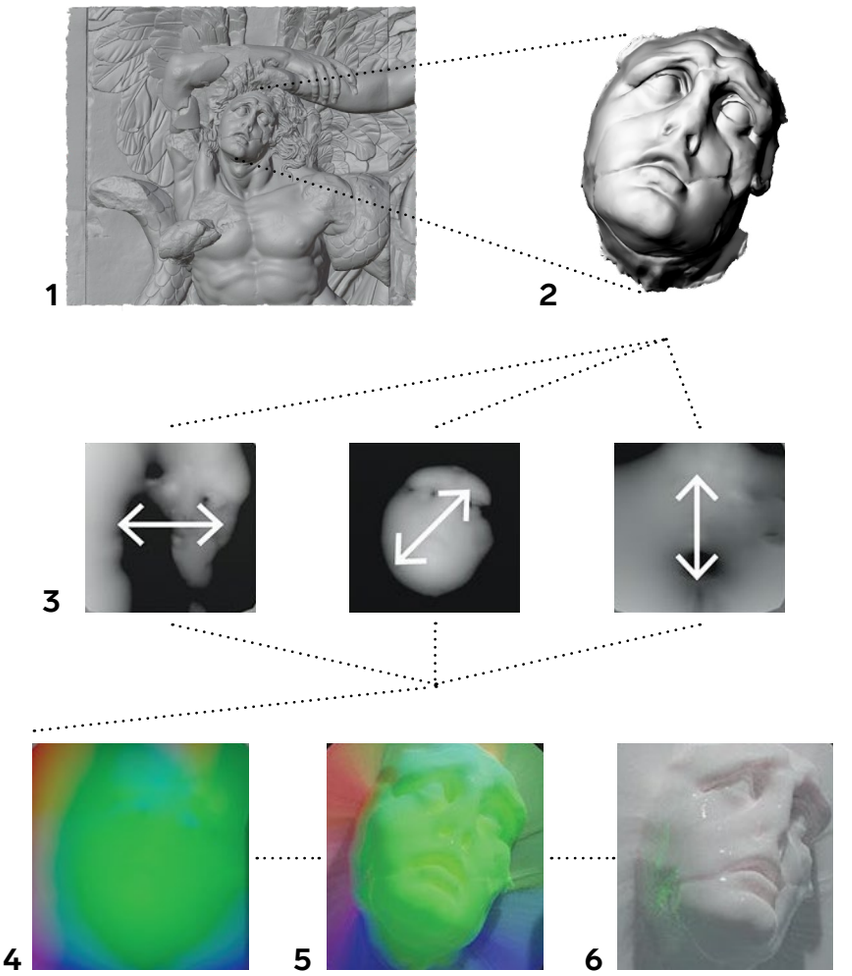
2. Fragments
Smaller fragments from the large mesh are selected and isolated for the dataset. The geometry is cleaned manually to be optimal for the next steps.

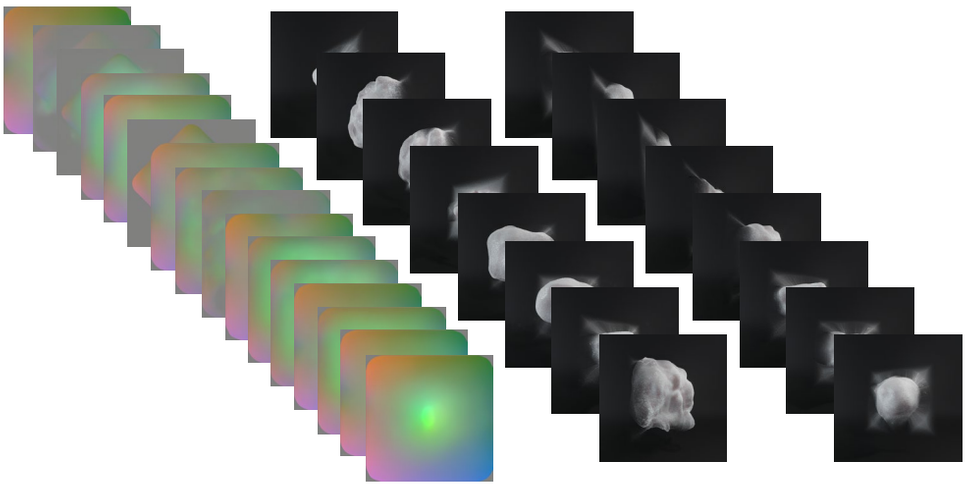
3. Geometry to Plane
The fragments geometry is “squashed” onto a plane, with displacements between points on the plane and locations on the 3d mesh stored as vectors separated into their x,y, and z components.

4. Vector Displacement Maps (VDM)
This vector information is stored as the RGB channels of a raster image. (32-bit TIFFs)

5. VDMs as training dataset
VDM format is both amenable to a GAN, and is able to be re-interpreted as vector displacements from a base raster plane. We used them to train a generative adversarial network (StyleGAN2-ADA) on VDM data.

6. VDMs to sculptural forms
Finally we use the synthetic data to translate VDMs “back” into pseudo-3d sculptural forms. The resulting synthetic VDMs from the GAN pipeline is used to feed the final artificial reliefs.

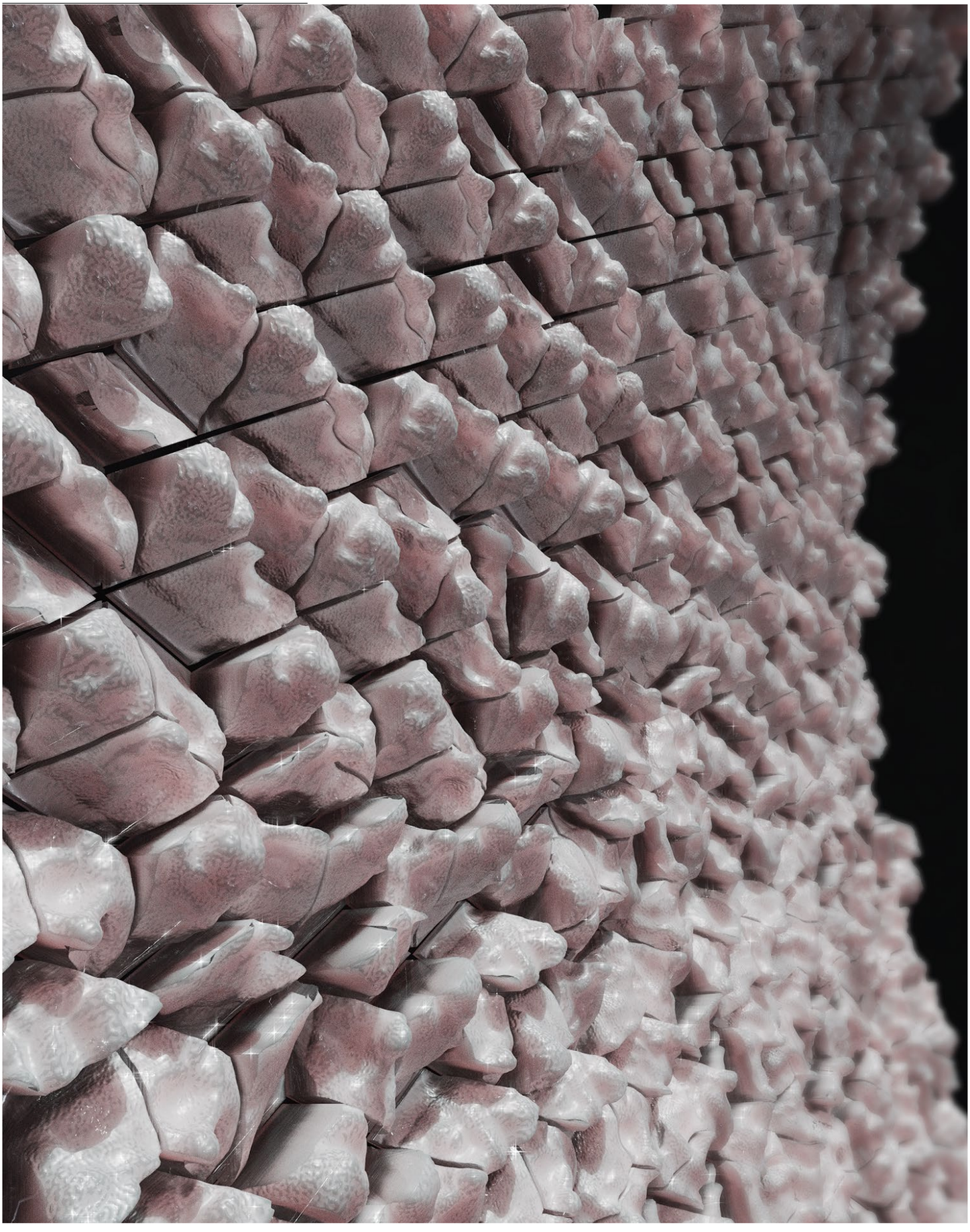




Training Data

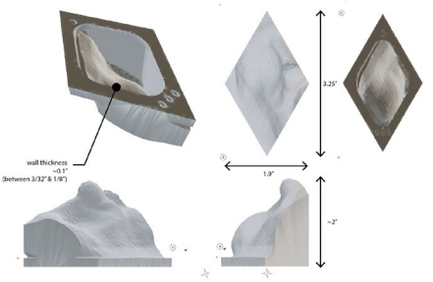
200 VDMs
3000 VDMs (augmented)

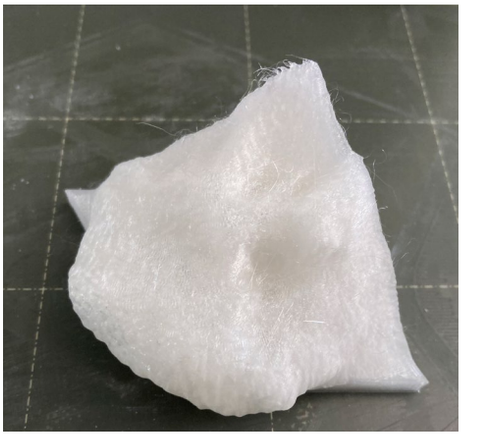
Right: Latent space relief.
Recalling the rhythmic symmetry of frieze, a “walk” through the latent space of a GAN is aggregated across a surface in high relief



Fabrication

The realization of the Artificiale Rilievo project as an artistic installation came through the aggregation of simple modular geometric tiles of the latent space walk. The team decided to physically fabricate these modular tiles through a plethora of fabrication steps and material treatments.



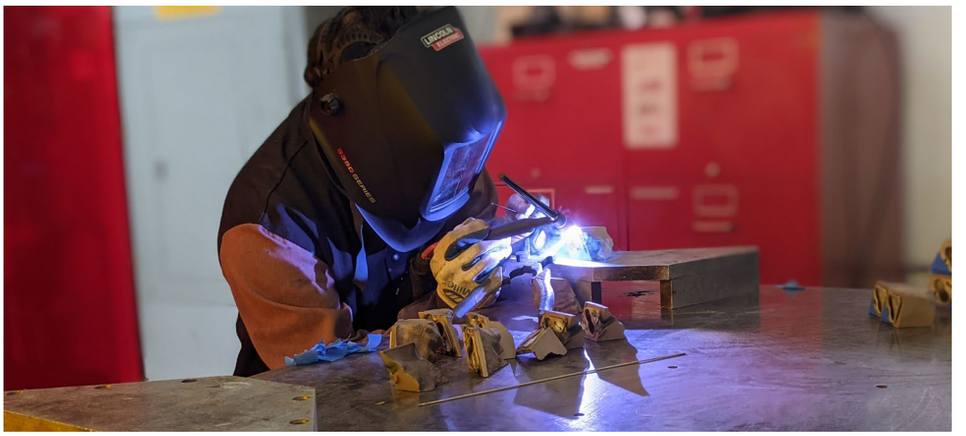


Casting

The latent space walk was modeled in defined modular tiles. The tiles were 3D printed in a SLA printer using a special PLA-type filament, suitable for investment casting. The printed tiles were casted in bronze using a “lost-wax process”.

Bronze post processing

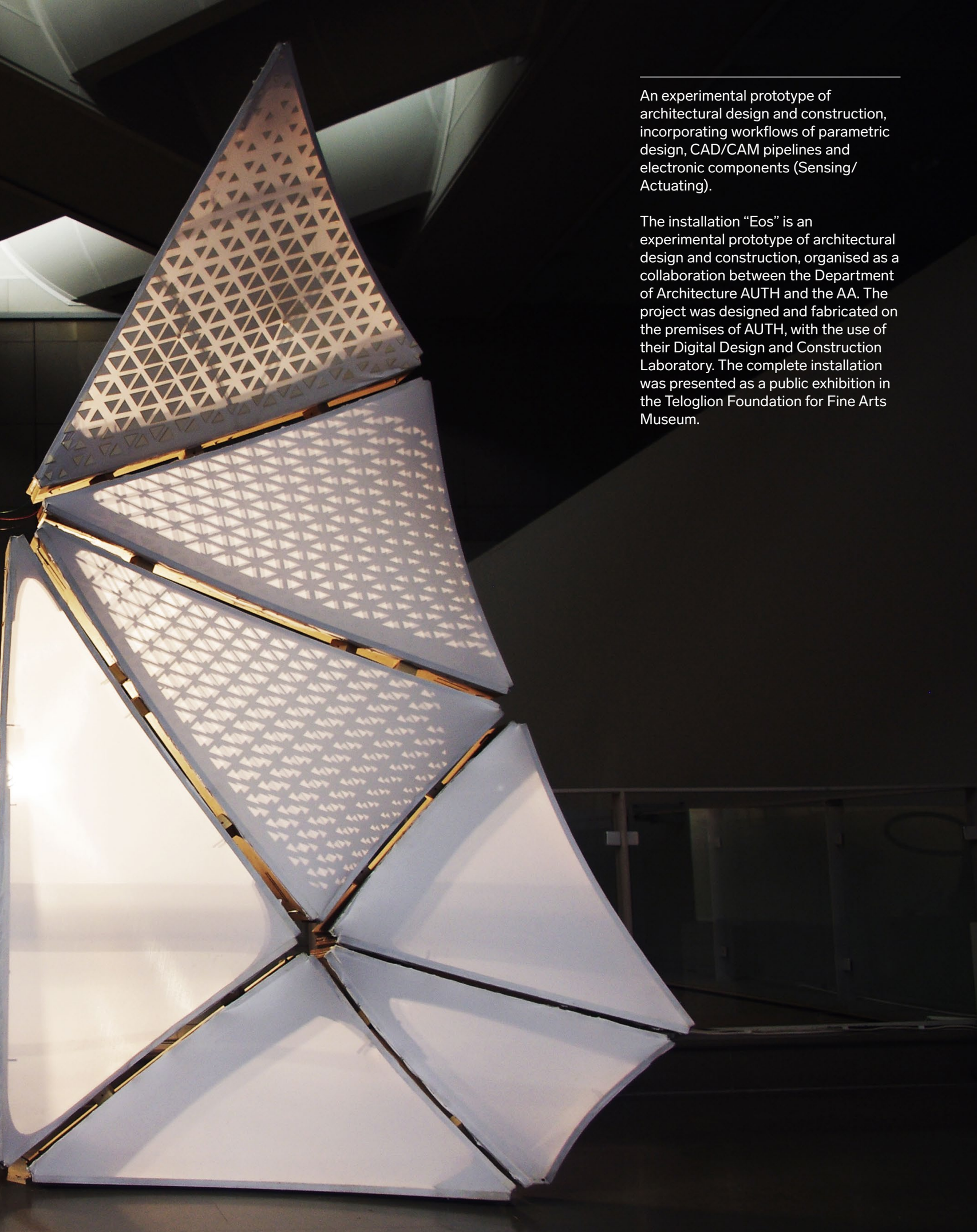
Finishing steps included the typical clipping, sanding, and de-burring, as well as the welding of brass mounting plates, and the application of a cold patina through a series of chemical baths and manual scrabbing and cleaning.



EOS

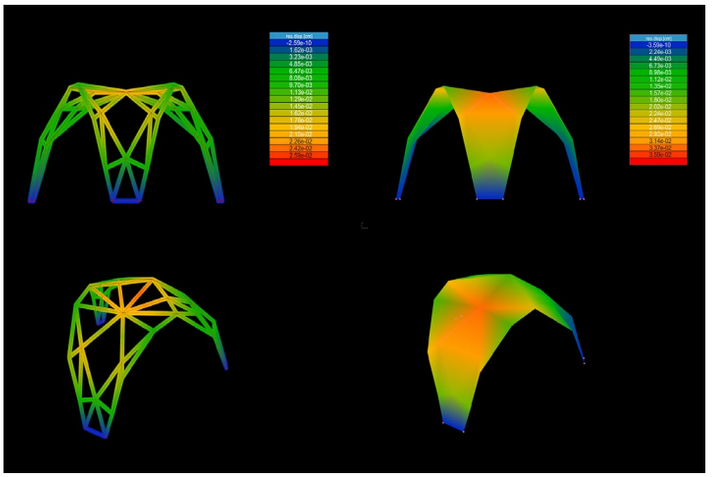
Architectural Association Visiting School
Thessaloniki Greece

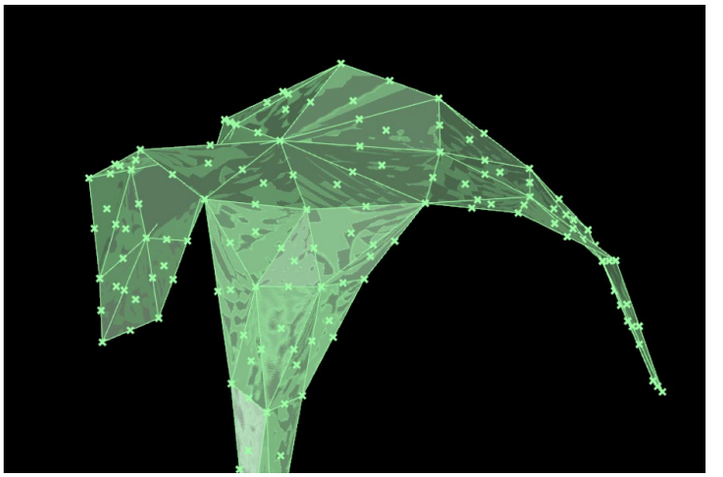
Fall 2015

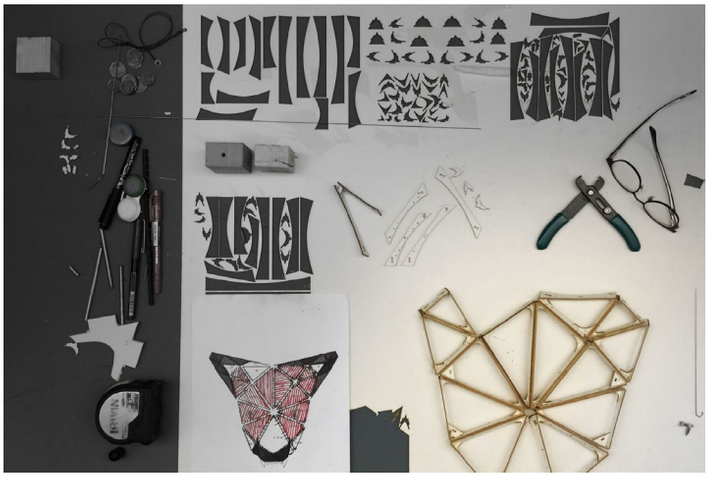


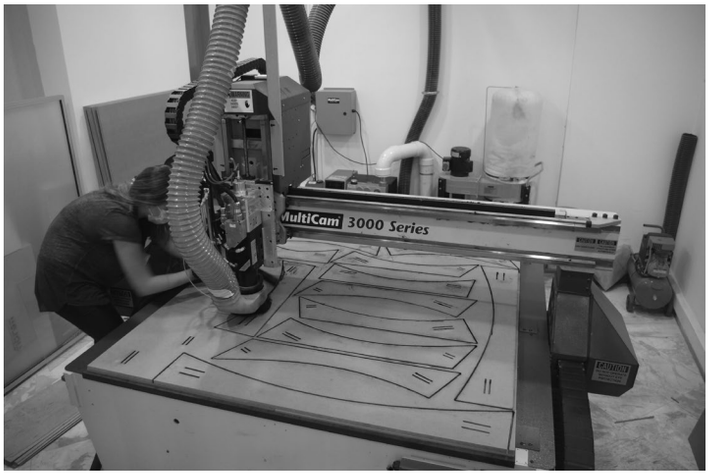
An experimental prototype of architectural design and construction, incorporating workflows of parametric design, CAD/CAM pipelines and electronic components (Sensing/ Actuating).

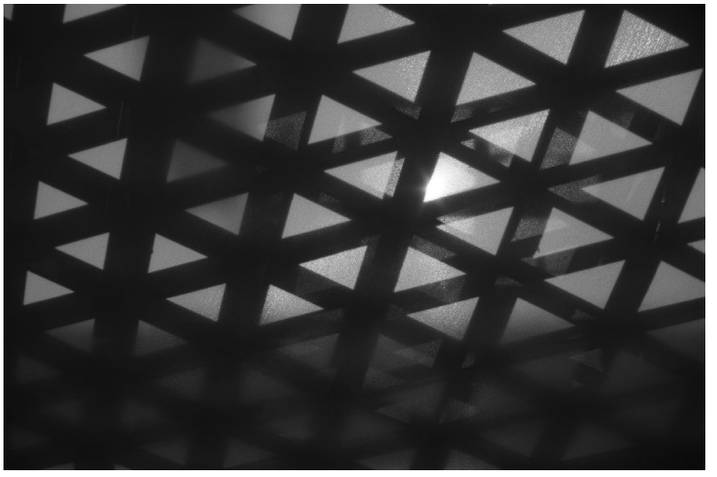
The installation “Eos” is an experimental prototype of architectural design and construction, organised as a collaboration between the Department of Architecture AUTH and the AA. The project was designed and fabricated on the premises of AUTH, with the use of their Digital Design and Construction Laboratory. The complete installation was presented as a public exhibition in the Teloglion Foundation for Fine Arts Museum.








MultiCam 3000 Series



The focus of this scientific design programme has been on the use of digital fabrication via computational design for the creation of a series of parametric proposals on interactive and kinetic morphologies.

Within the span of 10 days, Eos, an architectural prototype was developed and fabricated; the design process explored the limits and correlations between architectural design, technical expertise and modern digital construction. Cultural and environmental elements were integrated in the design highlighting a number of topics of contemporary reflection.

Eos is structured as a frame made of 123 pieces of composite wood (MDF) that have been digitally designed and constructed. The component-based prototype has its' different "cells" covered with Lycra, which is then fixed in multiple places. Arduino micro-controllers that were assembled by the participants enable independent interactive features by ensuring movements on Eos' surface in selected locations.

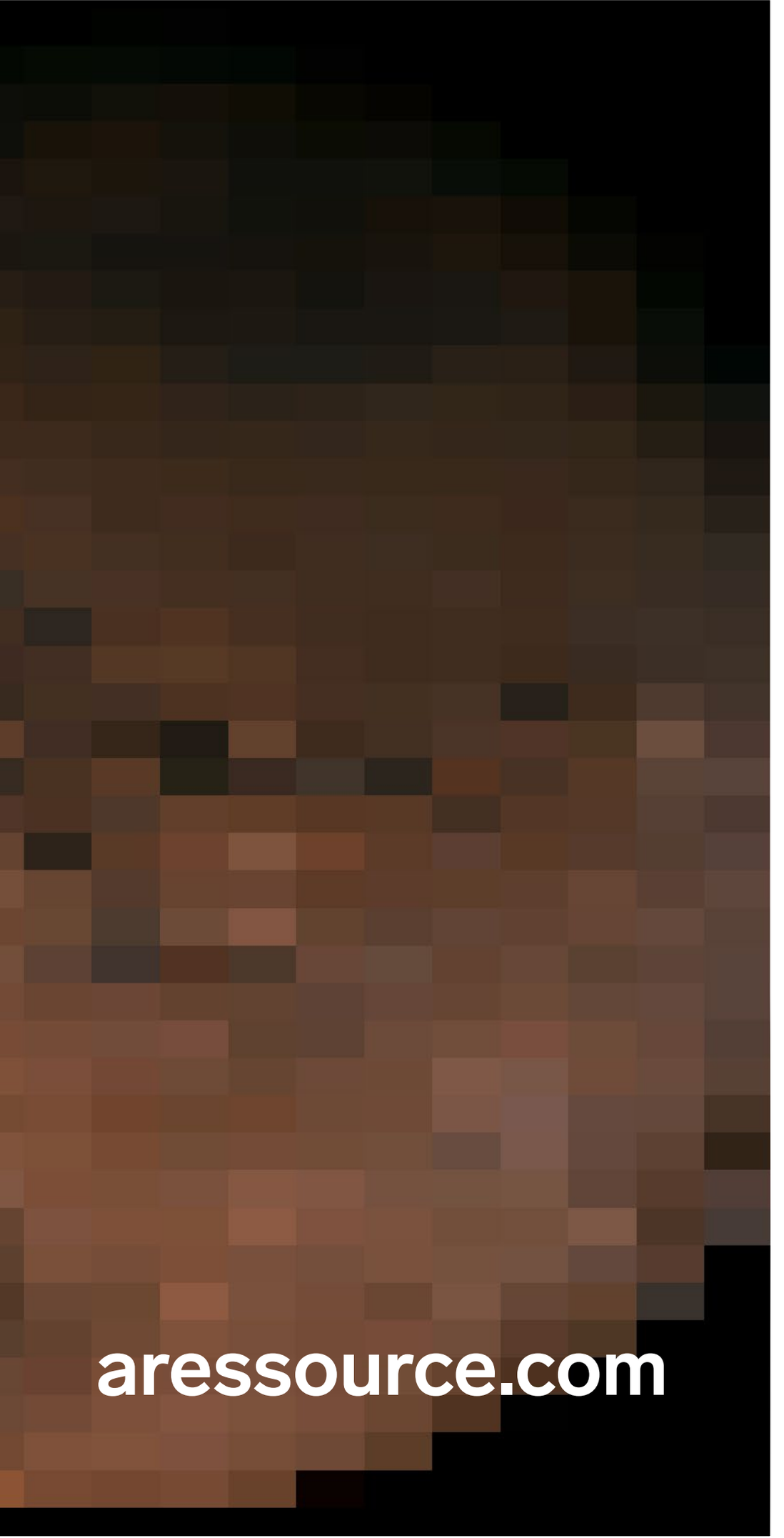
Apart from the motor mechanisms, the prototype incorporates visual animations, which arise from investigations of Thessaloniki's urban fabric and are 3D mapped and projected on Eos. Thus visitor participation and interaction is encouraged through the controlled movements and visuals of the surfaces in real time.

Ares Source

Georgios Grigoriadis

Fall 2021

A speculative design world-building project about open source space exploration



Ares: Mars

“Ares Source is a call to all communities and individuals to participate in the exciting new field of human extraterrestrial exploration through open source knowledge. Ares Source calls for the participation of all entities, from small amateurs and hackers all the way to governments and private/public space companies.

A simple yet elegant collaboration framework for equitable access to space.” A world and words building project about the probable (or maybe preferable?) futures of space exploration. Ares Source emerged from the pedagogy of “Design Frameworks: History & Methods” in the Master of Design program at UC Berkeley.

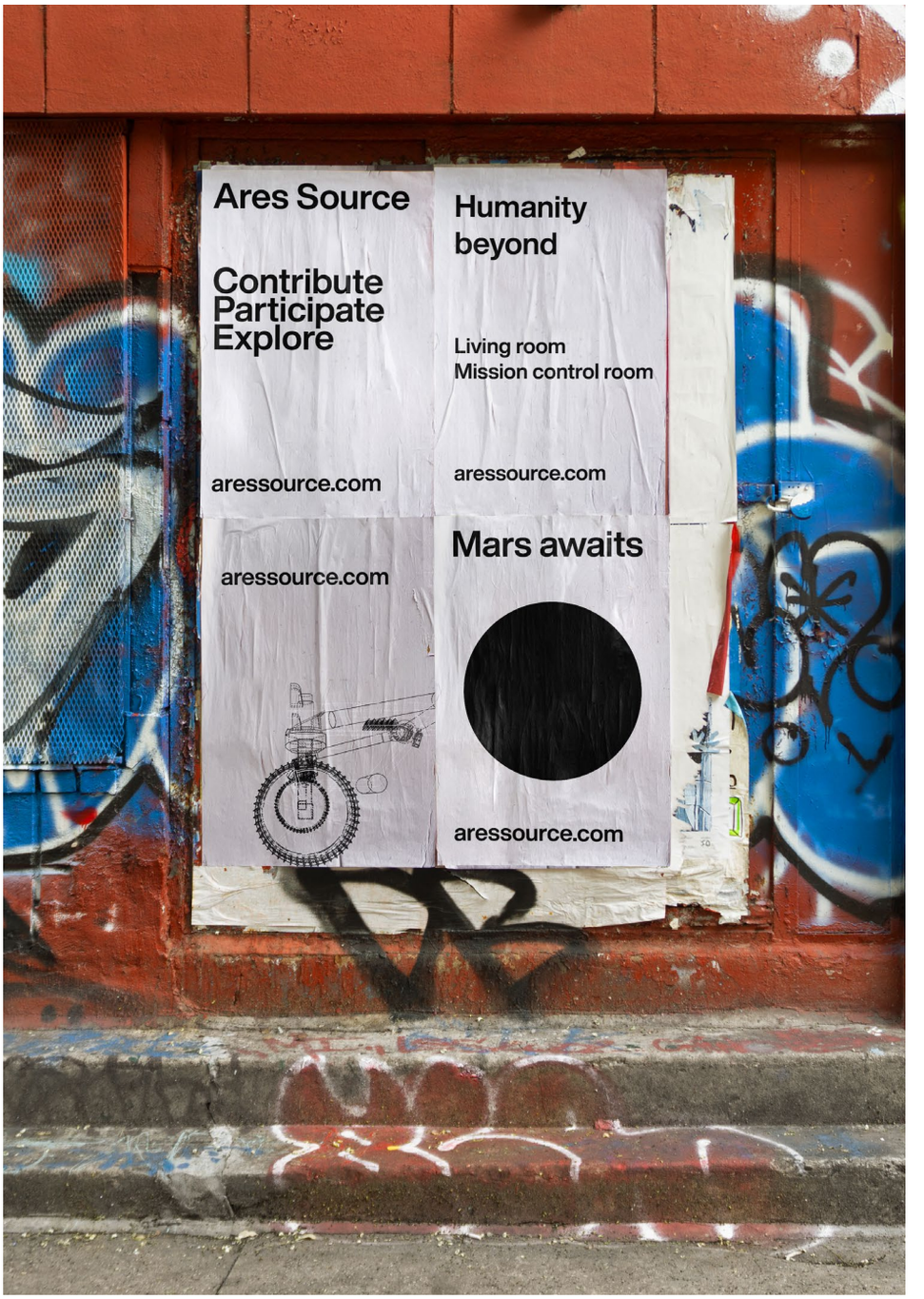
Read more about the world at **aressource.com**

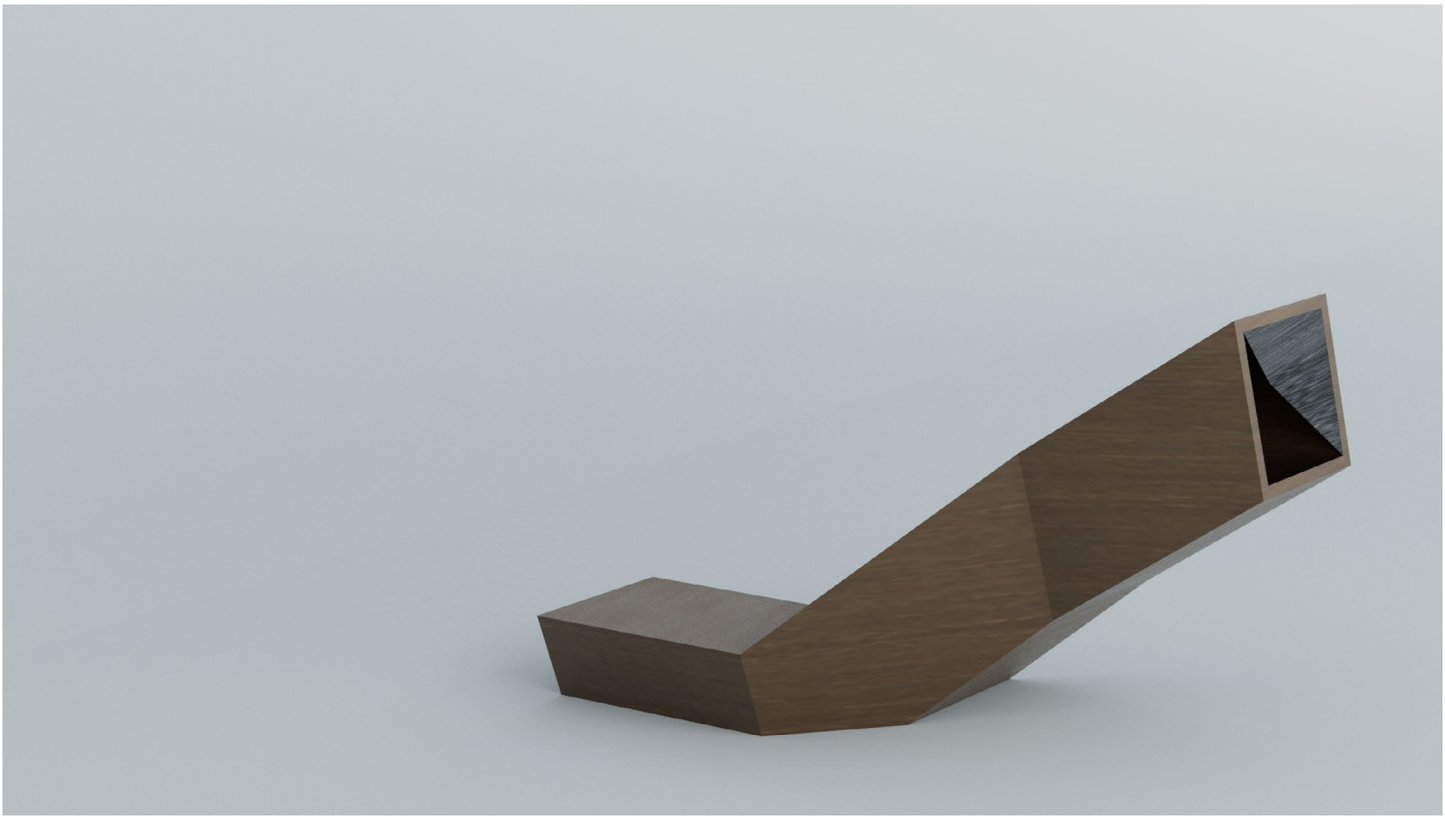
Mars
Automata
MAAS365
Schematics and Build Instructions
Ares Source Repository

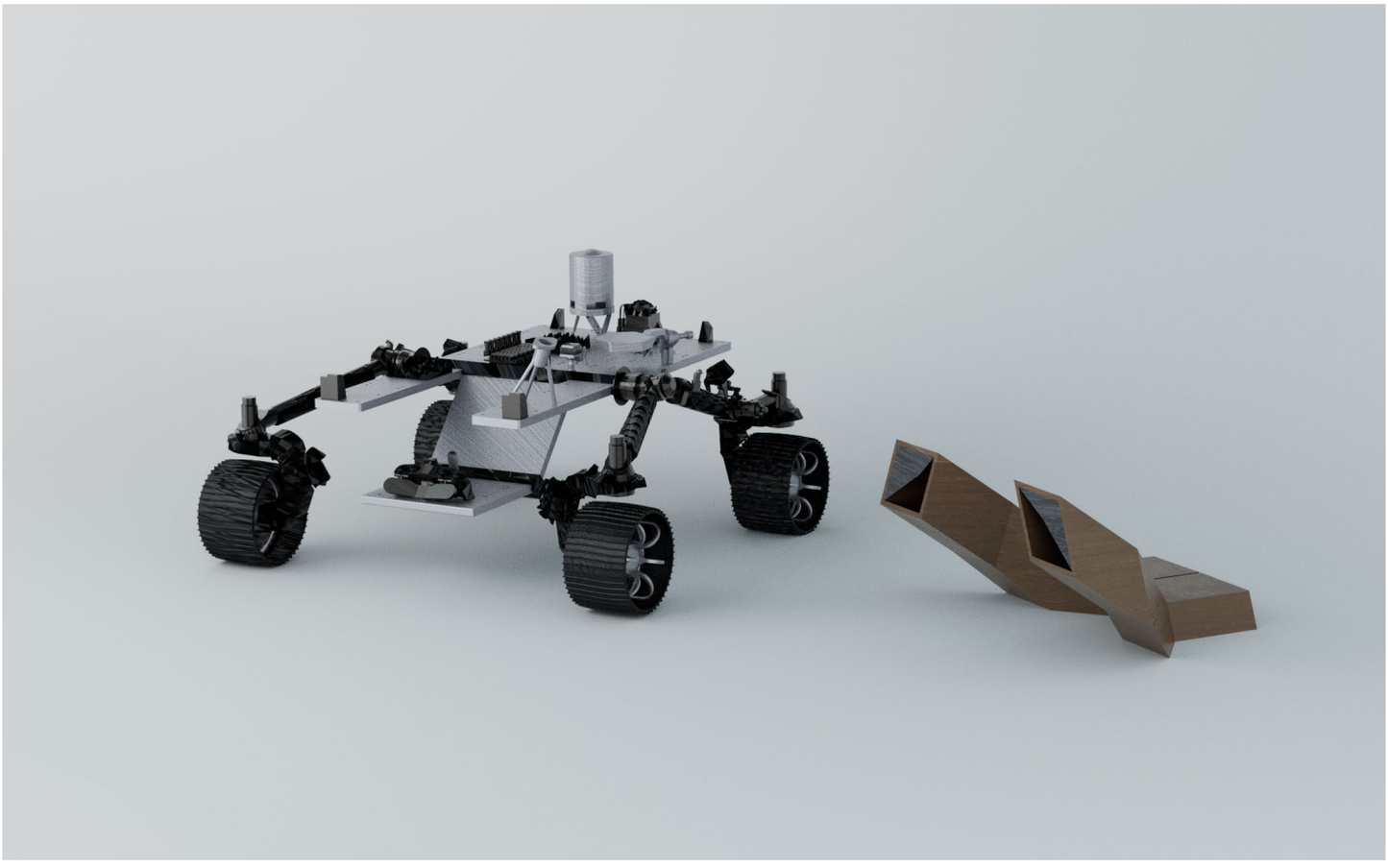
Ares Source Conference
(Huston, Online, Metaverse)
aressource.com

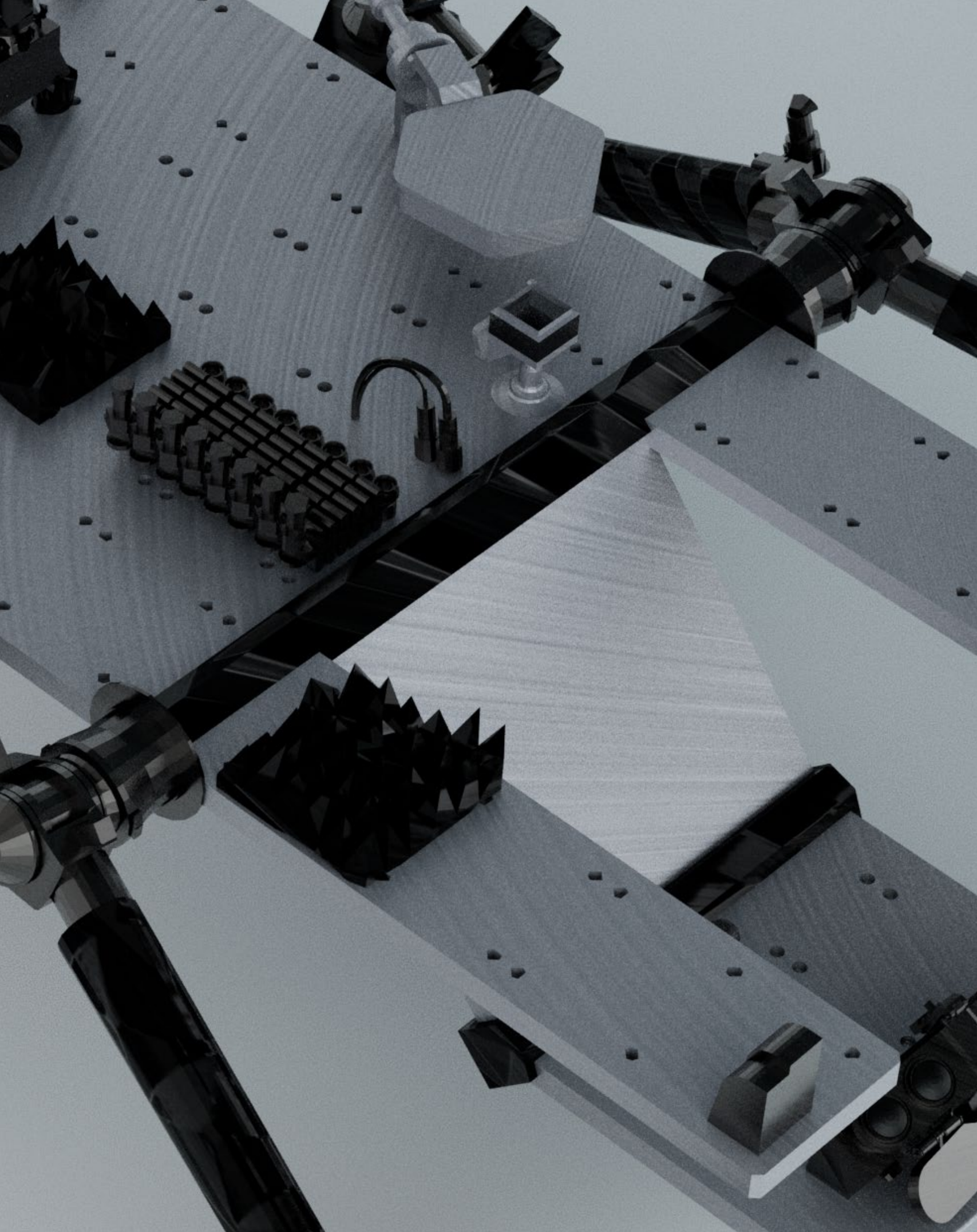
The Vision

Ares Source would live on the Internet and the goal was to share information, drawings, schematics and knowledge about space exploration. The vision was to create a hacker's manual to allow teams of people to fabricate and launch automata and projects into outer space.









GERUNDS

Dimitrios Chatzinikolis
Georgios Grigoriadis

Fall 2018

A narrative of technical causality

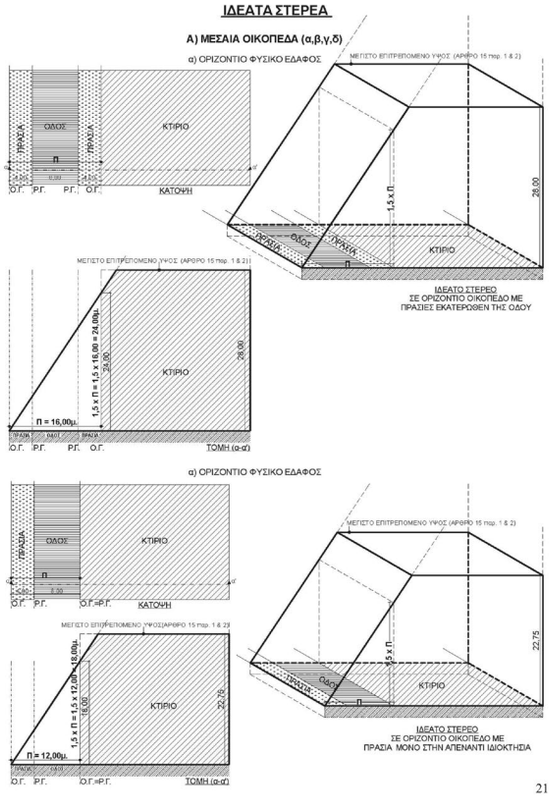
Diploma Design Thesis
School of Architecture
Aristotle University of Thessaloniki

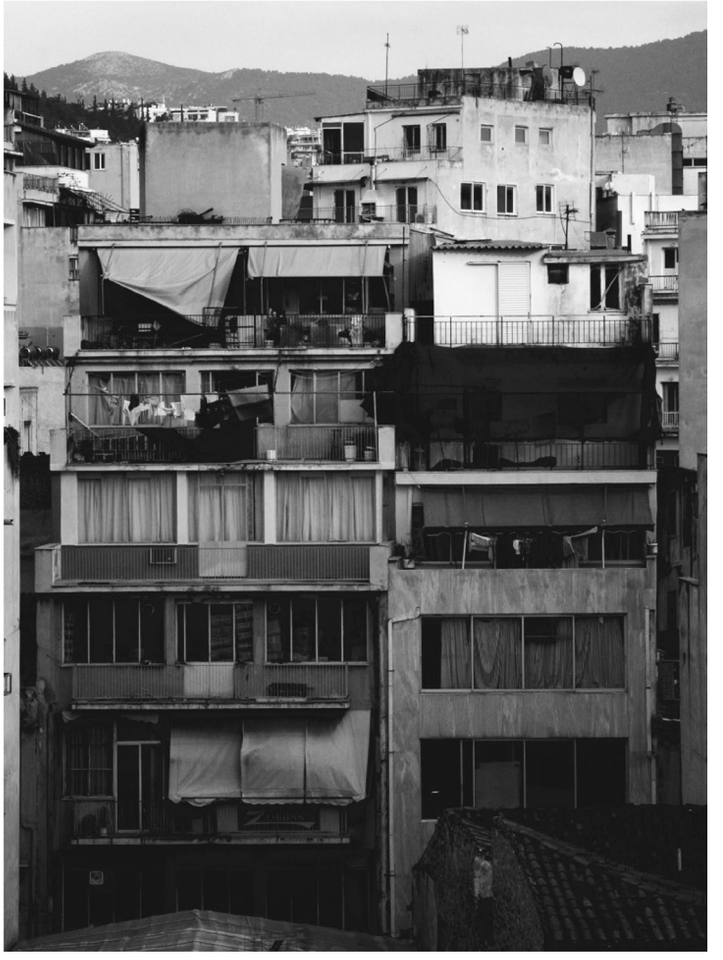
Acclaimed historian and architect Robin Evans stated, already in the early 00's, that the gap between architectural representation and actuality is constantly deepening. In a higher abstraction level, one could claim that if buildings are not enough, then, definitely, our drawings of buildings are not enough either. If we want to be honest with ourselves, our everyday design routine consists of endless translations, from Euclidean space to raster world and vice versa. How would be our perception transformed, if we took the above assumption extremely literally?

'Gerunds' is a research work- part of our diploma design thesis- that gets initiated from two starting points. The first is the notion of housing as part of building production.

The second one refers to the emergent technologies focusing on machine mediated vision. The former functions as primal material for the series of technical exploration that the latter follows. Housing primitives (Ideational Solids) of the Greek Building Regulation are used as input in a series of routines of technical Gerunds (Rendering, Sensing, Modeling etc.). The work tries to explore the ontological aspects of each command-gerund in the design proccess and how this could be translated in the production of space.

Gerunds' is an on-going transcription of architectural clichés, building regulations, and representational gestures on the yet unexplored landscape of machine mediated vision and housing primitives.





Transcriptions through Gerunds

Rendering, Sensing, Modeling, Specifying, Drawing, Substracting

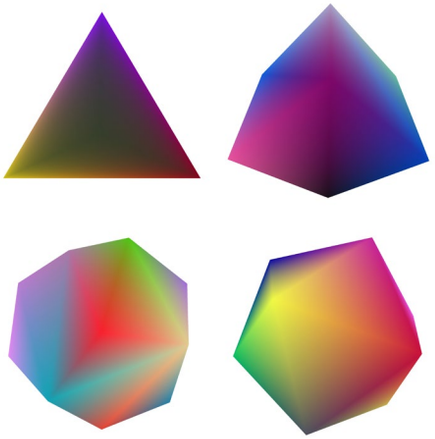
Rendering Platonic Solids
Rendering Ideational Solids

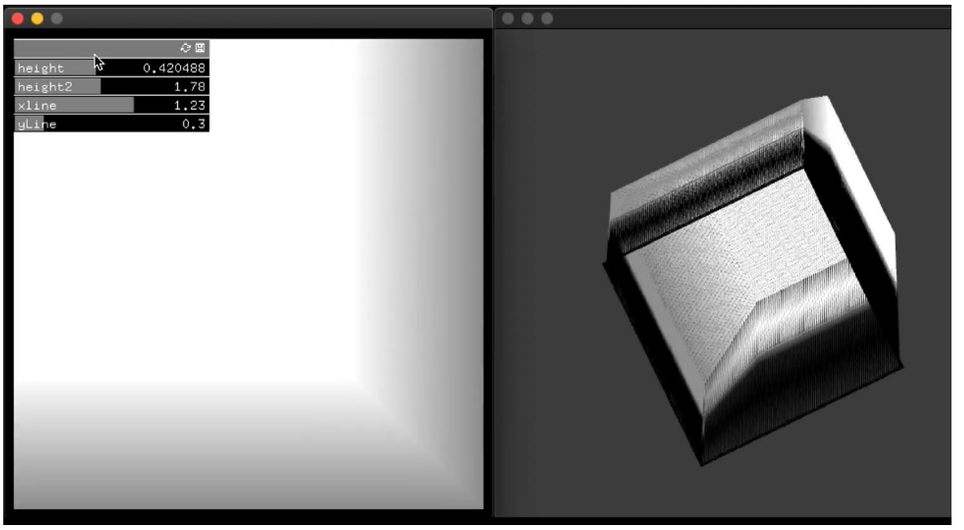
Rendering

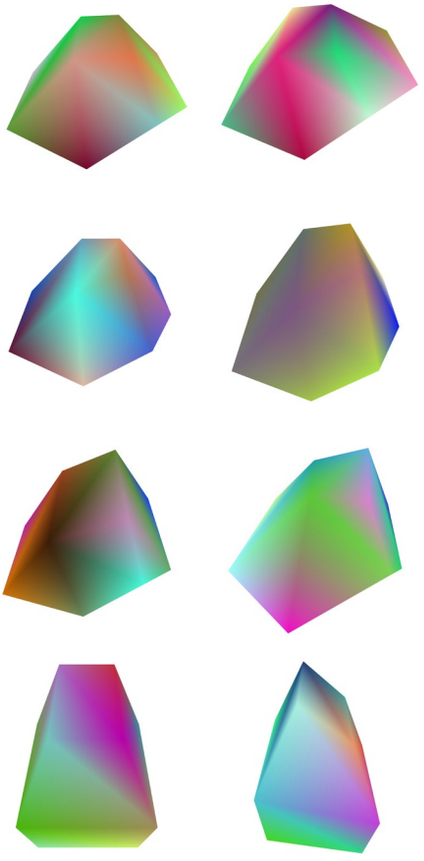
Rendering pseudo-geometries through gradients as height maps

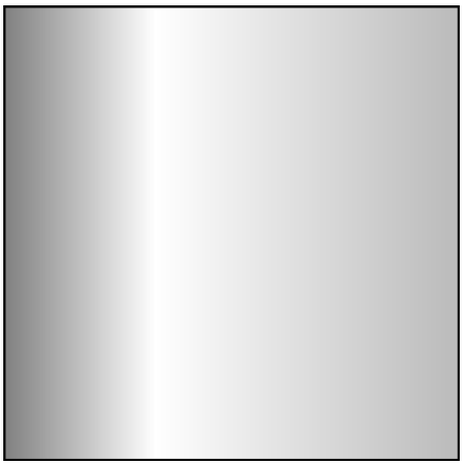
Tools

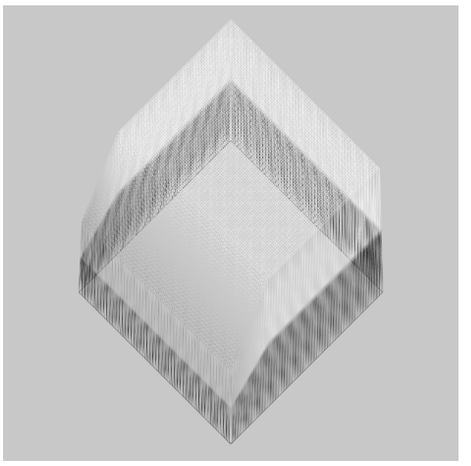
OpenFrameworks, Processing, OpenCV, Microsoft Kinect, Rhino3D, Cinema4D, CNC, 3Dprinting, Photogrammetry

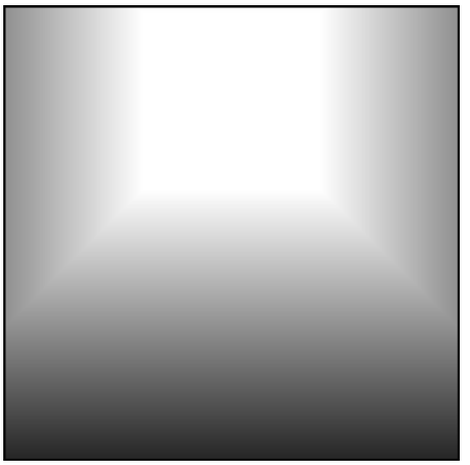


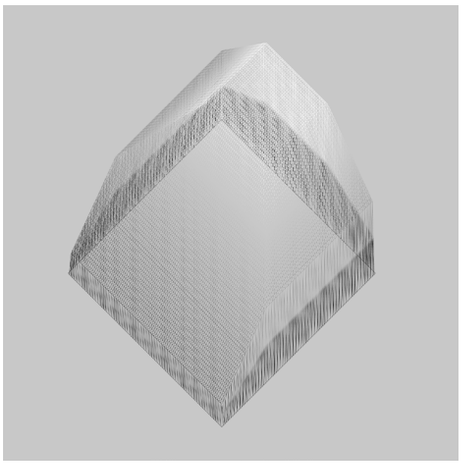








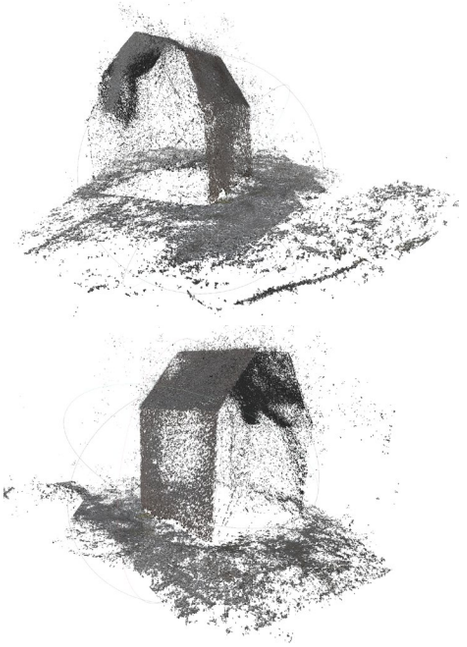


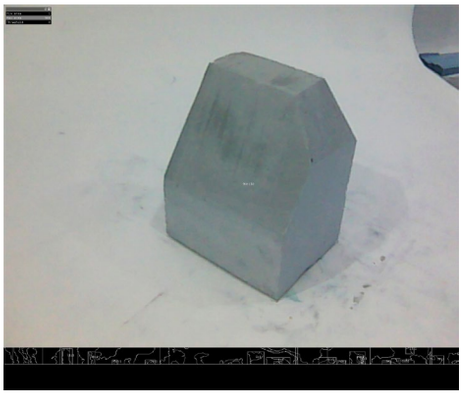


Sensing

Structure from motion photogrammetry pipelines

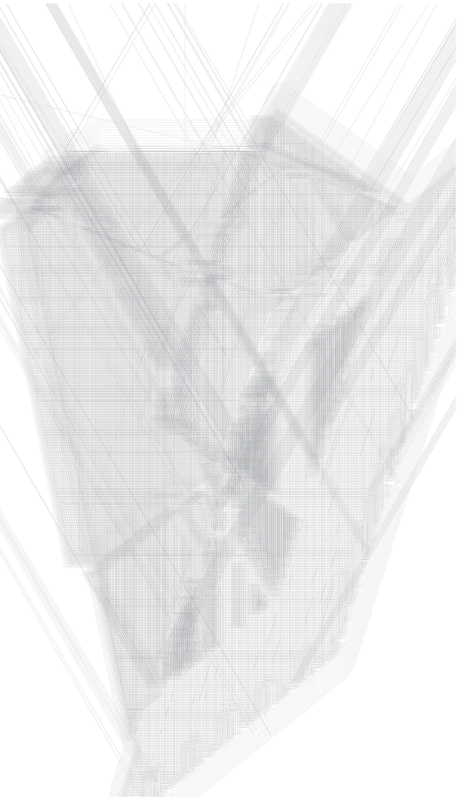
Microsoft Kinect, Open Frameworks





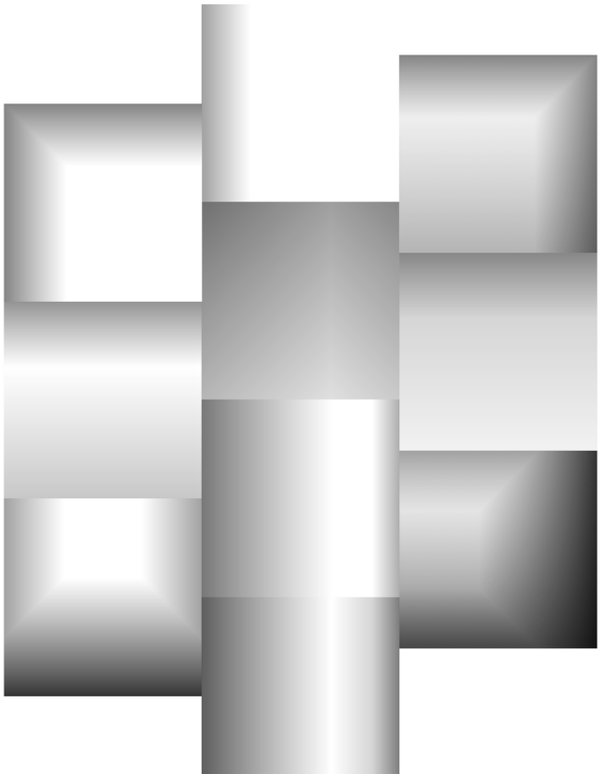
Sensing

Modeling



Modeling

Physical models of gerunds transcription pipelines



Georgios Grigoriadis

Designer, Architect, Engineer

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Education

University of California Berkeley **2021-2022**
College of Engineering, College of Environmental Design
Master of Design (MDes), Expected Graduation 05/2022

Aristotle University of Thessaloniki (AUTh), Greece **2012-2018**
Diploma of Architect Engineer (Joint Bachelor and Masters) (GPA: 9,29 / 10)

Experience

Graduate Student Instructor (GSI) / UC Berkeley Master of Design **Spring 2022**
Teaching Assistant. DESINV 200: Design Frameworks: History and theory of design, technology and future making. Professor: Dr. Randy Swearer

Jacobs Makerspaces Student Supervisor / UC Berkeley **Spring 2022**
Worked as a student supervisor in the makerspace of the Jacobs Institute for Design Innovation. Experience in woodshop, metalshop, and rapid prototyping.

Graduate Student Researcher (GSR) / UC Berkeley **2021**
Project "Artificialis Rilievo, GAN-generated architectural sculptural relief".
Under the direction of Professor Kyle Steinfeld (UC Berkeley CED, MDes)

Designer, Creative Catalyst / UC Berkeley Master of Design **2020-2022**
Designer for the graduate's program identity and digital presence. Creative and technical support on the website, brand identity and visual material.

Researcher / Innovative Environments Research Cluster AUTh, Greece **2019-2021**
Research on innovative approaches on architectural design, urban design, environmental design and the design of experimental spatial arrangements.

Researcher / MindSpaces (EU Research Project Horizon2020) **2019-2021**
"Art-driven adaptive indoors and outdoors design". Worked on the formulation of the research proposal, user research, user requirements and evaluation of the platform. **mindspaces.eu**

Researcher / V4Design (EU Research Project Horizon2020) **2018-2020**
"Visual and textual content re-purposing for Architecture, Design and VR games". Worked on the formulation of the research proposal, user research and requirements, and evaluation of the platform. **v4design.eu**

Architect Engineer, Designer / TTDZ Architects and Partners, Greece **2016-2018**
Contributed to the design and planning of awarded competition entries, commisions, projects and research activities of the office.

Architect, Designer (Co-founder) / **2018-2022**
GHOST office (Berkeley, Boston, Zurich, Berlin)
Space design agency. Design, Architecture and technology.

Co-founder / xyzzy, Creative Collective and Space, Greece **2015-2018**
xyzzy was a creative collective of architects, artists, scientists. Its purpose was to allow creative experimentation on technology, art and design.

Skills

Technical: Python, Processing, Open Frameworks, C#, HTML, CSS, Web Development, Wordpress/Woocommerce, Arduino, Raspberry Pi
Software: Adobe Creative Suite, Rhinoceros 3D, Grasshopper, Cinema4D, Fusion360, Unity, Unreal Engine, Twinmotion, Arnold, Keyshot, Corona, Photogrammetry Pipelines, MaxMSP
Physical: Robotics, Digital/Robotic Fabrication, CNC Machinery, Laser Cutting/Engraving, 3D Printing, Power Tools (Wood, Steel), Arc and TIG Welding, Soldering/Electronics, Vacuum Forming
Other: Sailing (Laser Radial/Open Sea), Cooking, Percussion, Drawing/Sketching
Languages: Greek, English, French

Exposure

Recipient of educational and design honors and awards in Greece and abroad. Exhibited in several venues and exhibitions internationally, including the **Architecture Venice Biennale (2021), Talinn Architecture Biennale, Ars Electronica** and others.
Full list of exposure and publications available upon request.

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Portfolio
Spring 2022