

**WONJOON OH**

**MECHANICAL DESIGN ENGINEER**

# CURRICULUM VITAE

Mechanical Design Engineer

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## EDUCATION

### **Master of Design**

University of California, Berkeley, United States

*Dec 2023*

### **B.S. in Mechanical and Aerospace Engineering, Cum Laude**

College of Engineering, Seoul National University, Seoul, South Korea.  
Cumulative GPA : 3.69/4.3 (92.9/100)

*Feb 2016*

## PUBLICATIONS

- Chung, J., Chung, J., Oh, W., Yoo, Y., Lee, W. G., Bang, H. A glasses-type wearable device for monitoring the patterns of food intake and facial activity. Sci Rep 7, 41690 (2017).
- Chung, J., Oh, W., Baek, D., Ryu, S., Lee, W. G., Bang, H. Design and Evaluation of Smart Glasses for Food Intake and Physical Activity Classification. J. Vis. Exp.(132), e56633, doi:10.3791/56633 (2018).

## TOOLS & SKILLS

- Design- Fusion 360, Rhinoceros 3D, SolidWorks, CATIA, Autodesk Eagle.
- Digital Fabrication- CNC Machining, Laser Cutting, 3d Printing.
- Craftsmanship- Conventional Milling & Lathe, Woodworking.
- Physical Computing- Arduino, Raspberry Pi, Processing.
- Programming- C++, Java, Javascript.

## PROFESSIONAL EXPERIENCE

### **Mechanical Engineer @ Tesla Design Studio**

*May 2023 - Aug 2023*

- Integration and coordination for building an experience model for a next generation vehicle.
- Engineered functional exterior components for experience vehicle.
- Fabricated a rapid prototype for a novel seat adjustment mechanism.
- Researched and designed 6 degrees of freedom (DOF) motion platform mechanical system.

### **Advanced Robotics Mechanical Designer @ Gentle Monster**

*Oct 2021 - Jun 2022*

- Participated in multi-media/robotics installation art pieces as an in-house mechanical designer from the initial ideation stage, giving technical assessments for exhibits from an engineering perspective.
- Designed and researched coaxial 3-DOF parallel joint mechanism for humanoid and animatronics to replace conventional serial joint mechanism.

### **Mechanical Designer & Project Manager @ Envisible**

*Oct 2014 - May 2021*

#### **Interactive Media Art**

- Participated in 10+ media art exhibition projects, by designing and building mechanical and hardware parts for the installation.

#### **Kids' Cafe Franchise Funtory House**

- Played key role in opening 8 kids' cafe across South Korea and luring 5000 customers a month, by designing and building interior structures, huge sculptures and media kiosks.
- Developed 10+ interactive devices to encourage kids' physical activity by designing and deploying the mechanical and electronic parts.

#### **Versatile Plastic Building Block Brickit**

- As a project coordinator in launching a consumer product Brickit, a plastic DIY furniture kit for kids and family, involved in the whole product launching process starting from ideation to packaging and shipping. Also set up supply chain and storage management system of the product and the accessory components.
- Made it possible to build multi-scale structures and objects with plastic bricks through researching bricklaying-specific design methodology by developing patterns and mechanisms, and developing accessory parts.
- Led interior design projects by managing team members, laborers and schedules, and overseeing the on-site progress, including three Families & Kids facilities in Incheon International Airport Terminal (Jan 2021 - Present).

### **Control Engineer & Software Developer @ Robotis**

*Jun 2014 - Aug 2014*

- Developed LabVIEW example programs and wrote SDK manuals of the examples for Dynamixel, an all-in-one smart actuator for robots, and for DARWIN-OP2, an open platform humanoid robot.



# MOMENT CUBE

2022, Team Academic Project

## An Analog Smart Home Controller for Digital Space

With MomentCube, We attempted to invent a solution to replace existing control devices for smart home systems, which are often overly complicated and aesthetically unpleasing. The initial concept for the MomentCube was rooted in the following three primary objectives:

- 1) The invention of a piece of technology that did not immediately reveal itself through traditional digital signifiers.
- 2) The design of a thoughtful analog mechanism that could control digital functionality.
- 3) The creation of a product that would forefront and celebrate tactility and touch.

The tray detects which side the cube is lying on using hall sensors and magnets. Users can change the room's mood to their preset 'Moment' by turning the cube to the respective side, and adjust the intensity of the mood by rotating the knob.

I developed an interesting algorithm to detect the cube side and provide further information for potential future iterations, but more on that later.





**MOMENT CUBE**





# MOMENT CUBE

## CONTRIBUTION

- Developed Cube side detection algorithm
- Wrote Moment, MomentCube library
- Wrote software for the project
- Advised on the physical fabrication

## TOOLS & SKILLS

- Arduino
- C++
- Fusion 360





# PLAYFUL PLASTICITY

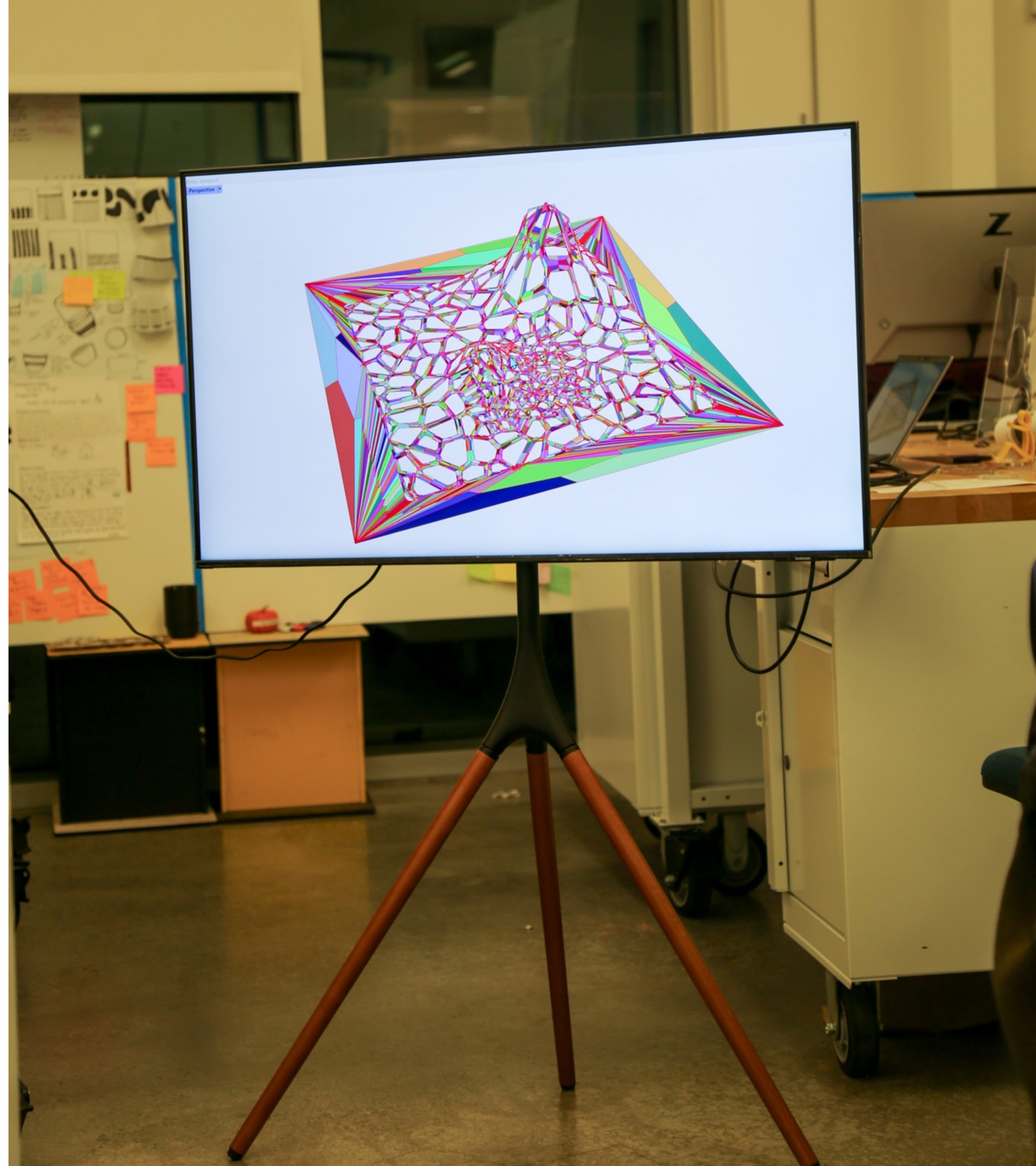
2023, Solo Project

## Ludic and Intermittent Engagement with 3D Models

Playful Plasticity is a system where users can interact with the target 3D model in real-time or asynchronously. Users can use their own design as the target 3D model, or they can start from basic 3D shapes such as cubes or spheres. It features a touchscreen along with three pen-type pointing devices. (pointers) Each pointer corresponds to three modules which have different effects on the target 3D model, which are: deformation module, surface module, and color module.

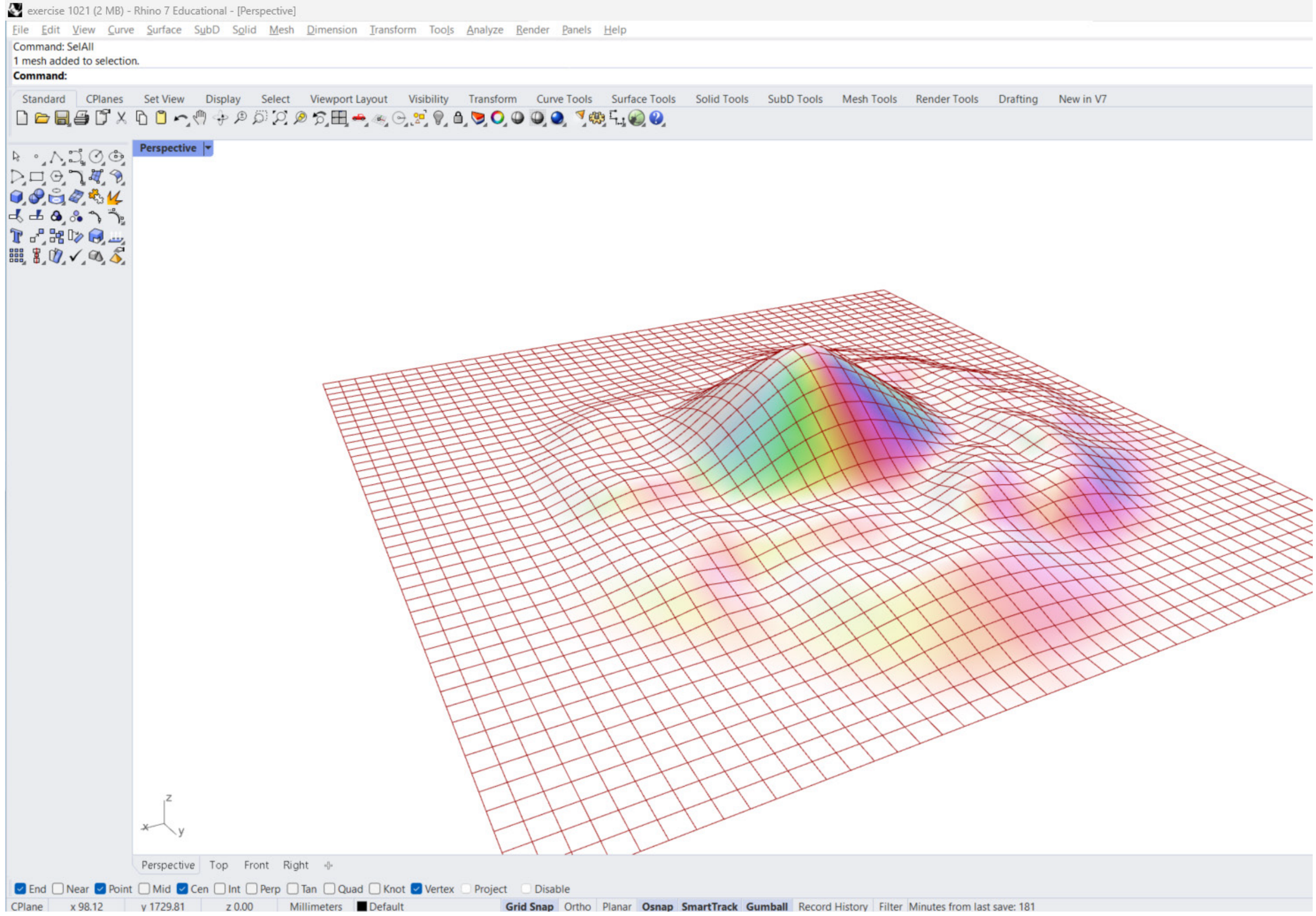
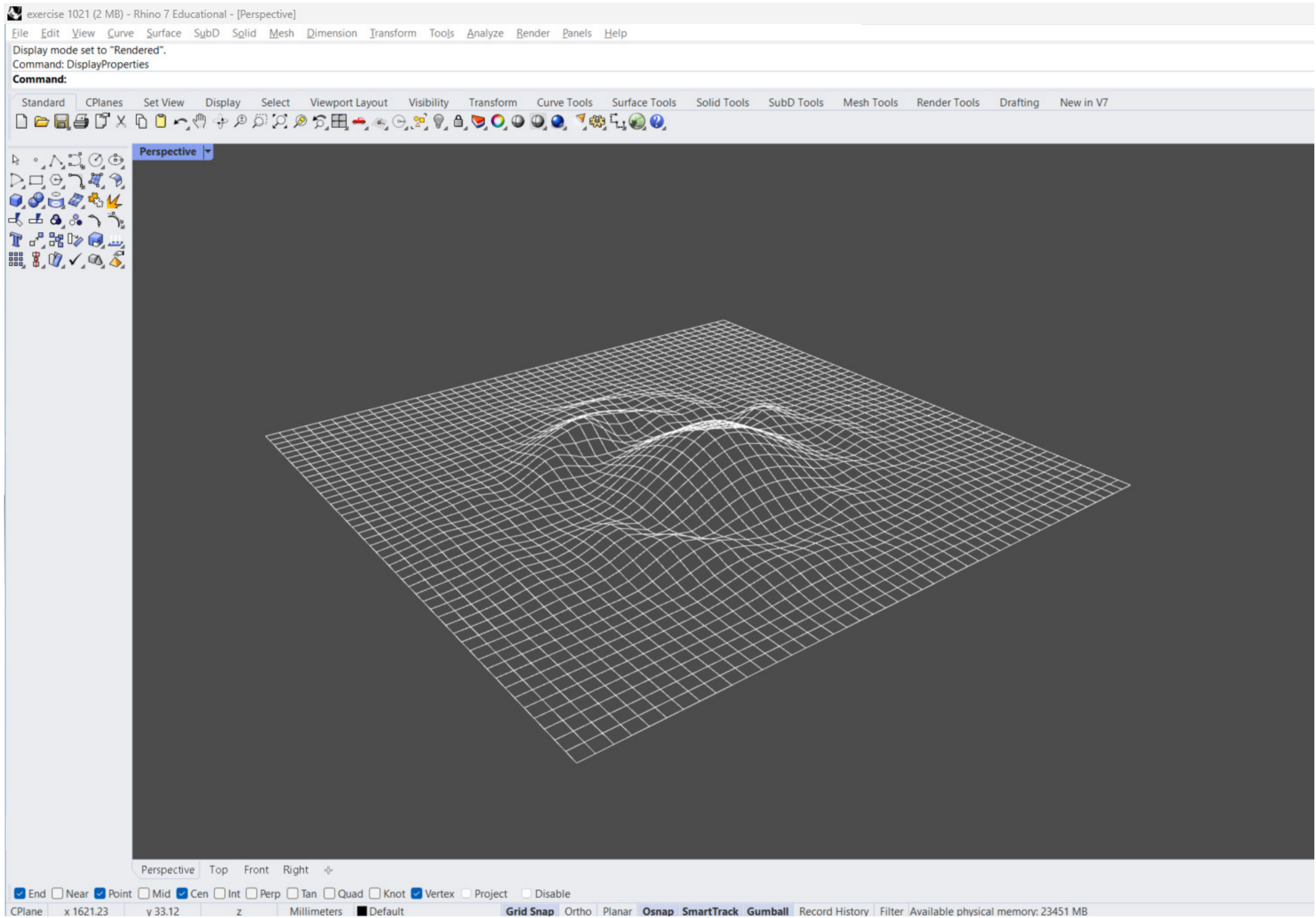
## TOOLS & SKILLS

- Rhinoceros 3D & Grasshopper
- Python, C#





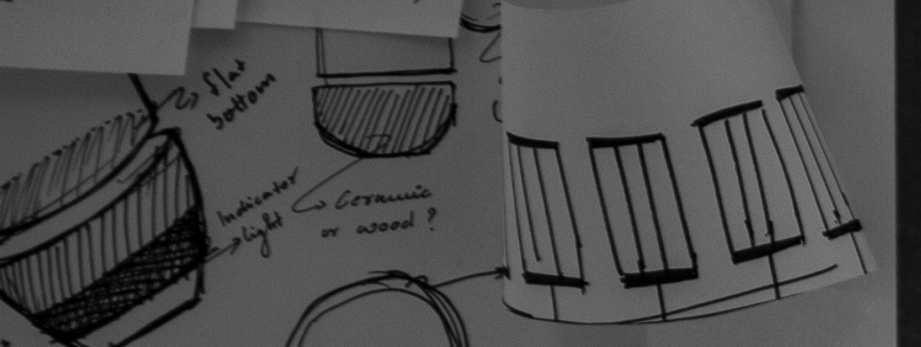
# PLAYFUL PLASTICITY







Groove thickness = 0.5mm  
 but = 0.85mm



I AM A THESIS WRITING MACHINE

ESP32 Relative position

3D print patterns Detachable



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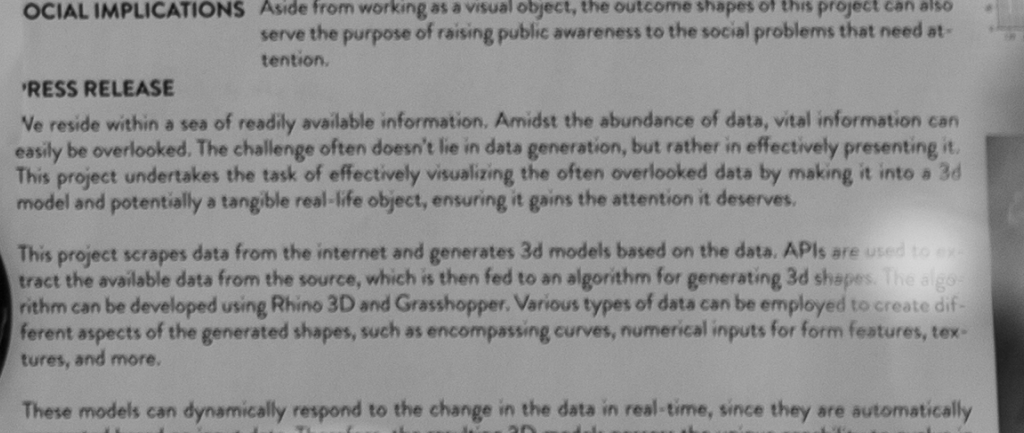
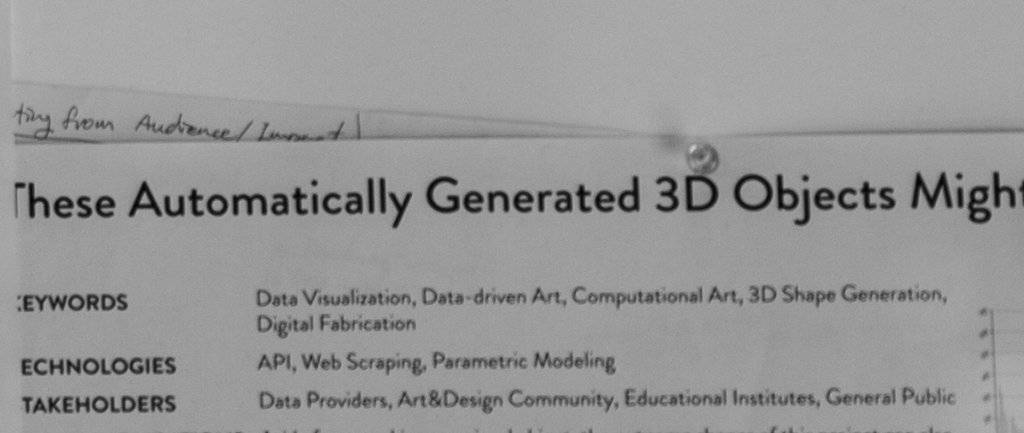
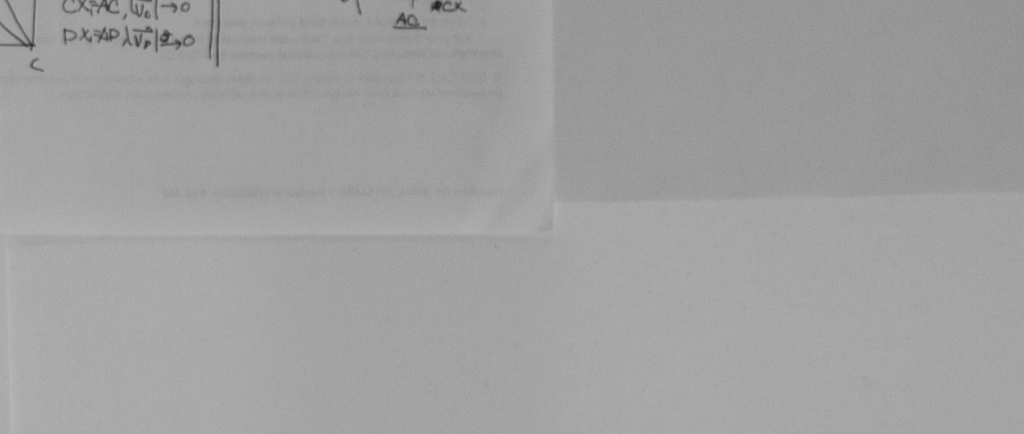
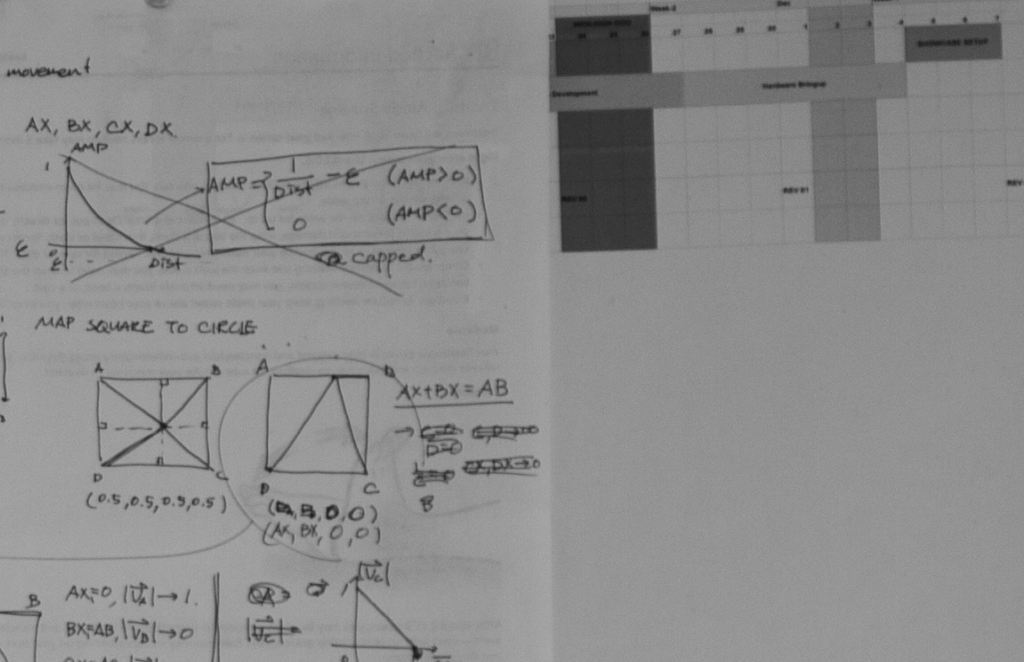
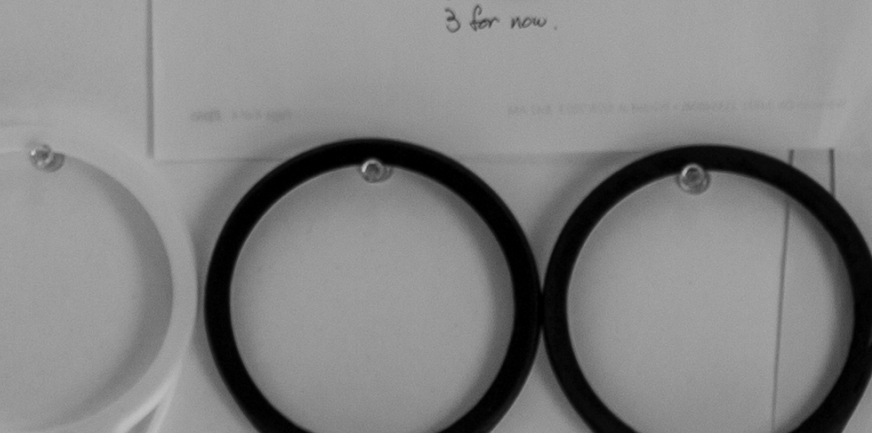
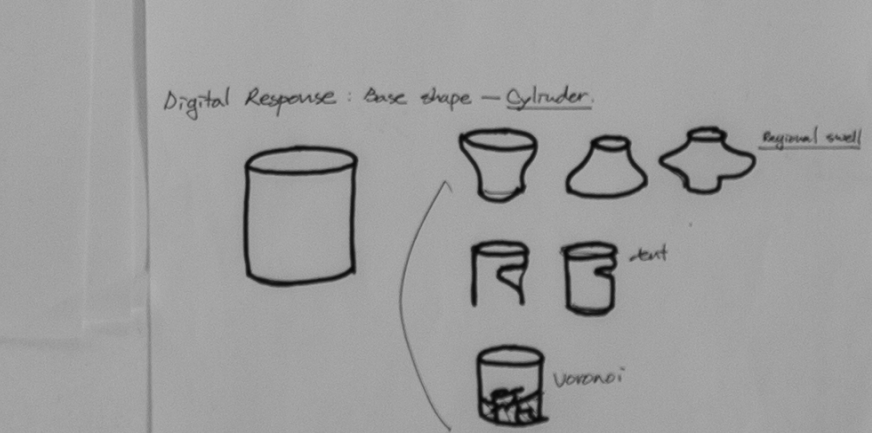
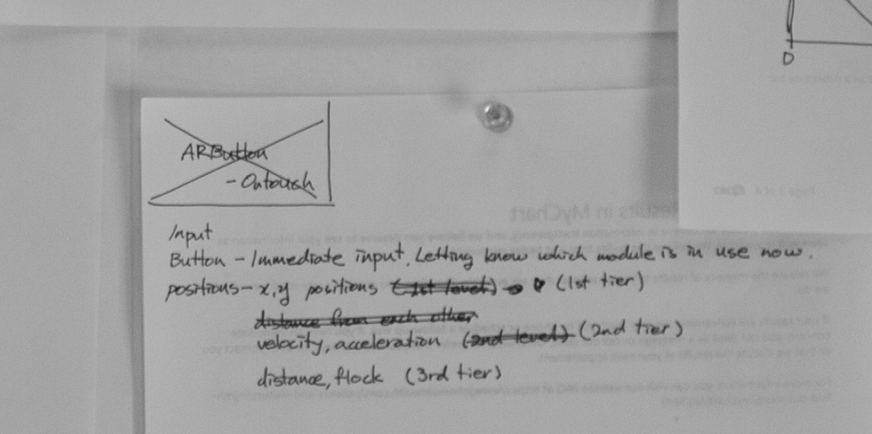
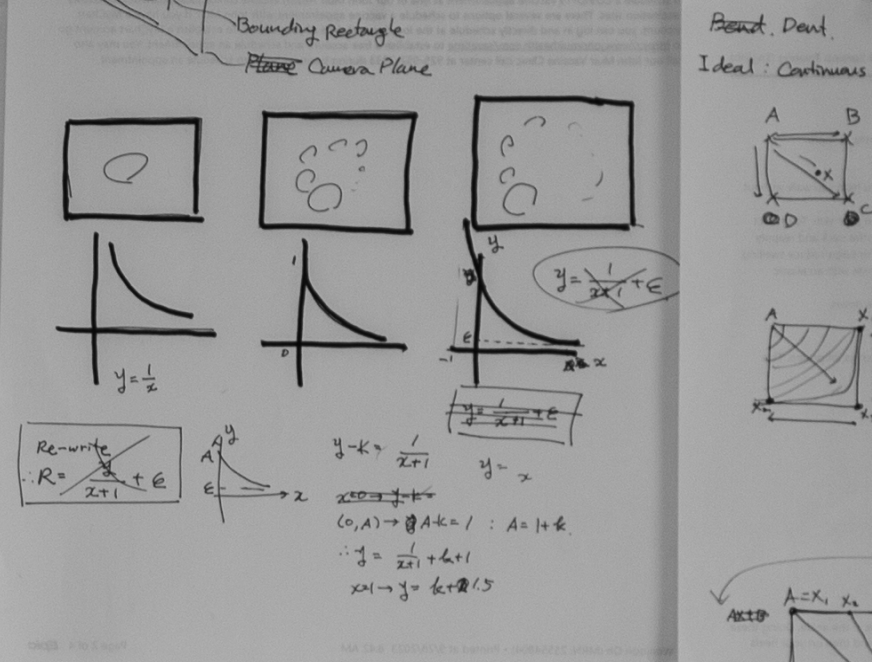
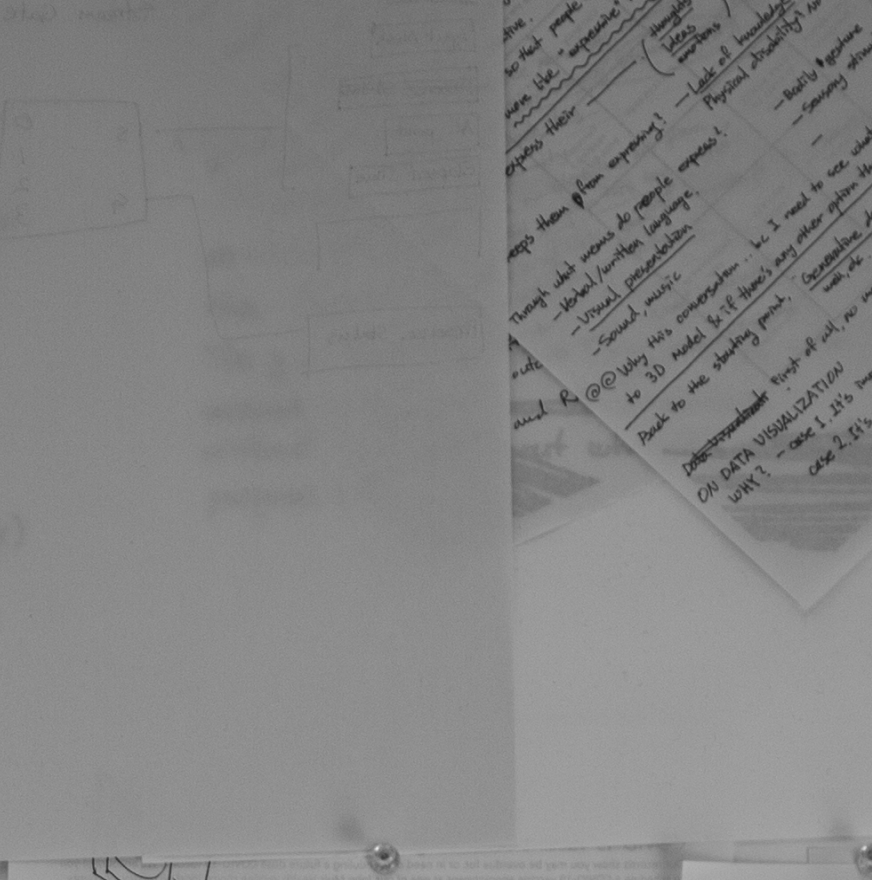
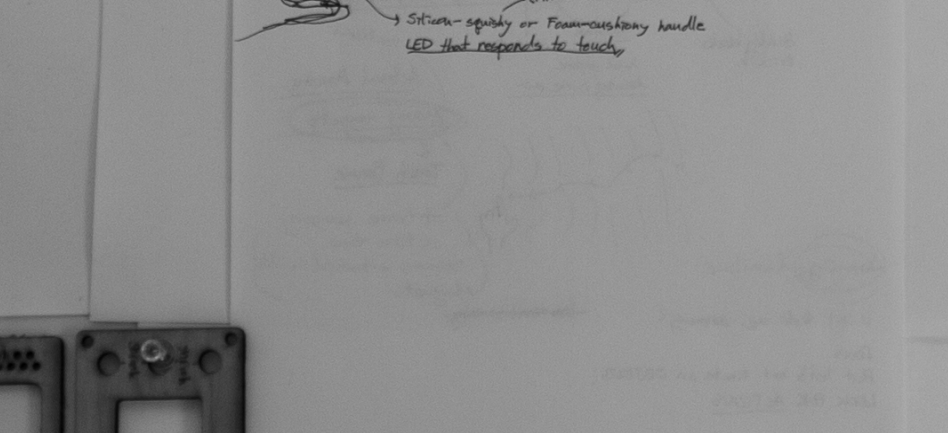
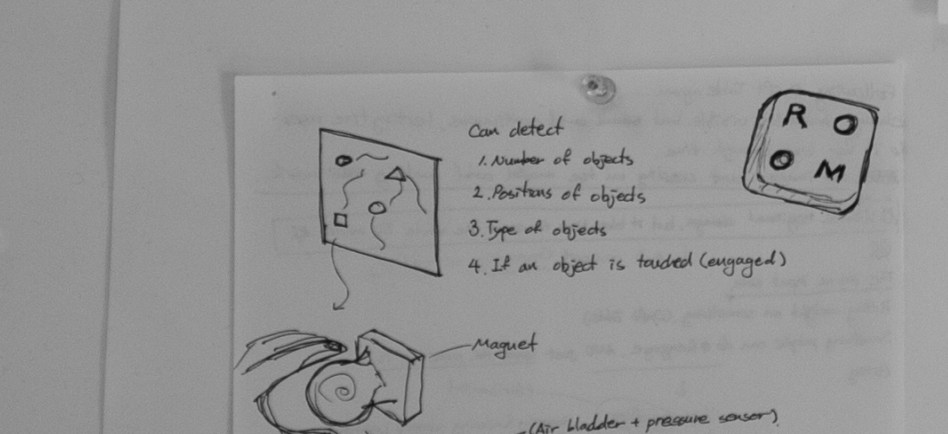
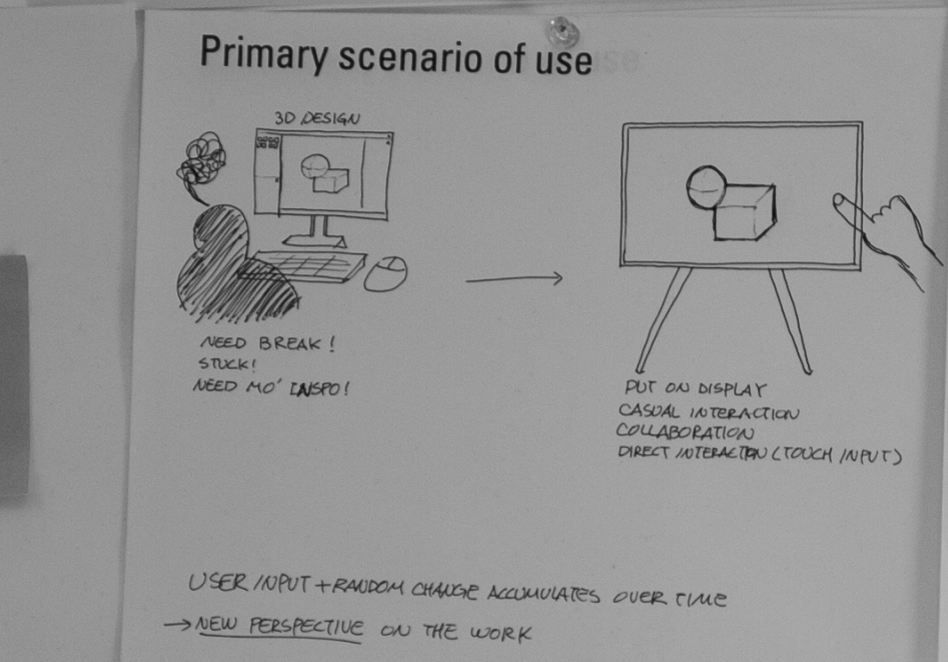
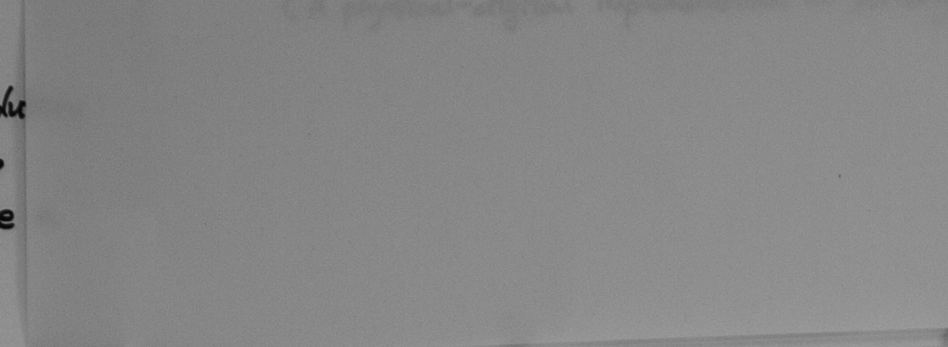
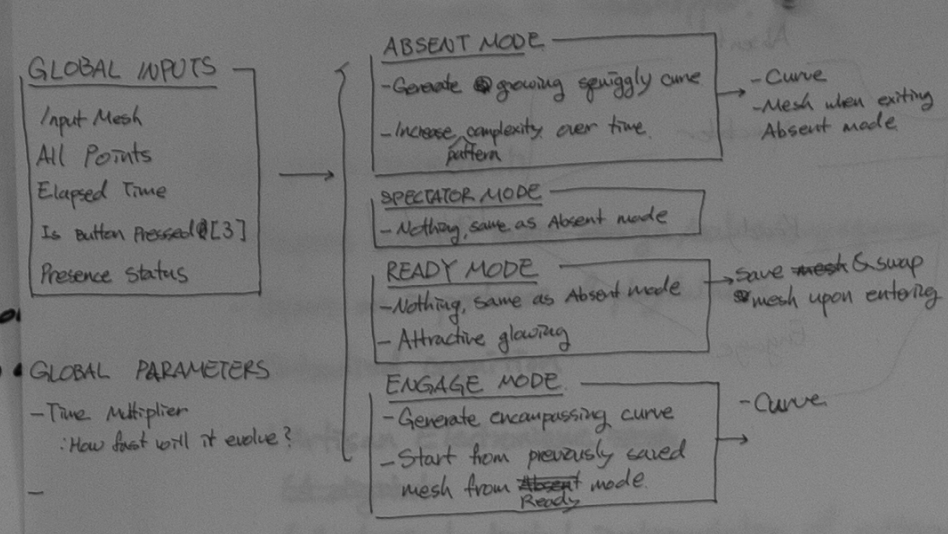
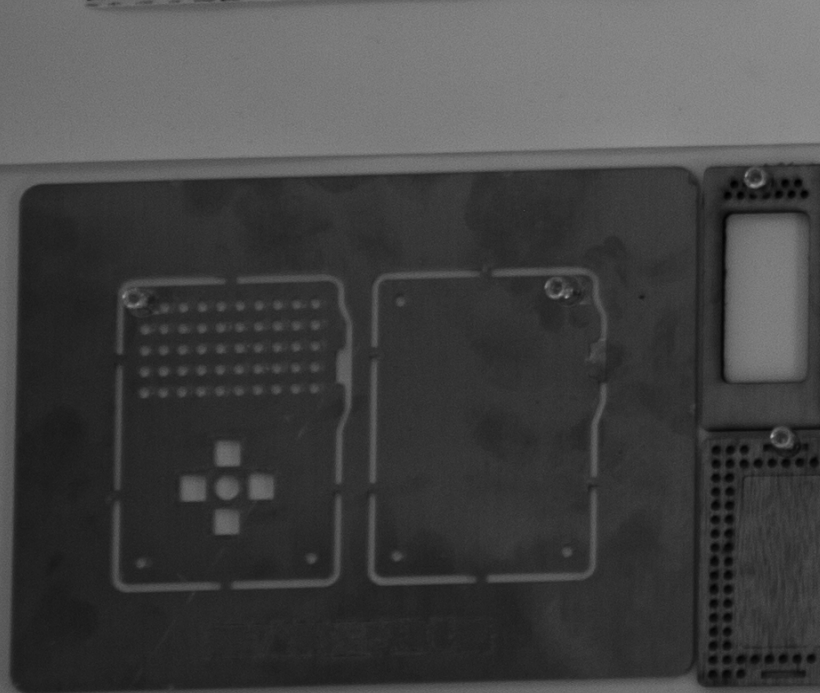
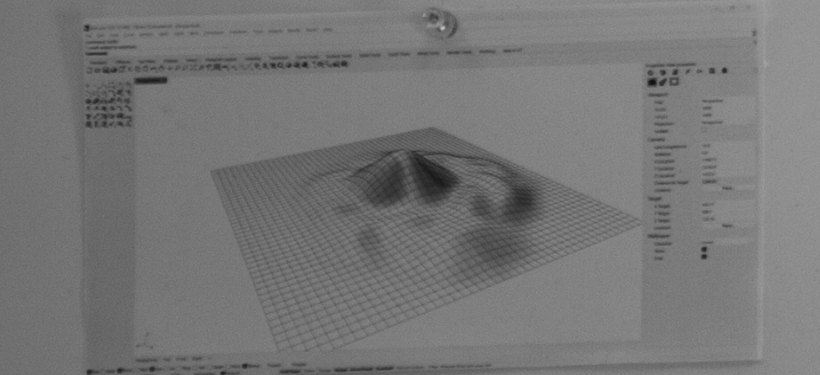
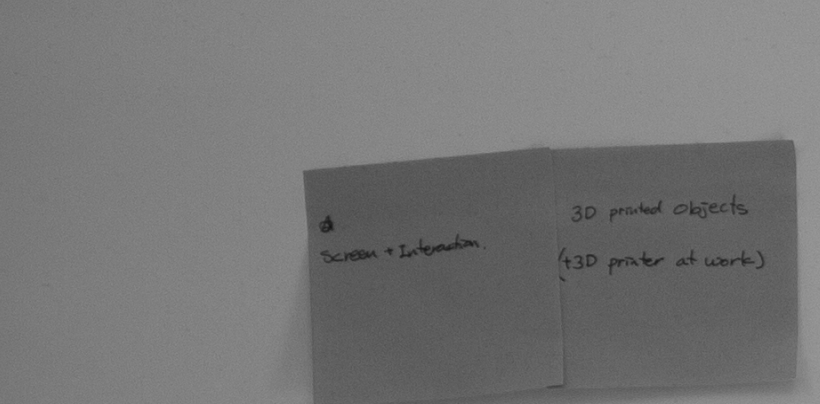
Carthika

Who it's for  
 3D designers looking for inspiration.  
 And/or general people

What it does  
 It takes physical input (positions of magnets on a board), maps it into parameters for Rhino Grasshopper for form change.

Why it matters  
 Playfulness could help find original & novel solutions to problems and could even be useful to develop occupational performance. This project gives people chance to be engaged in playing with something mindlessly.

Exhibition layout



These Automatically Generated 3D Objects Might Change

KEYWORDS: Data Visualization, Data-driven Art, Computational Art, 3D Shape Generation, Digital Fabrication

TECHNOLOGIES: API, Web Scraping, Parametric Modeling

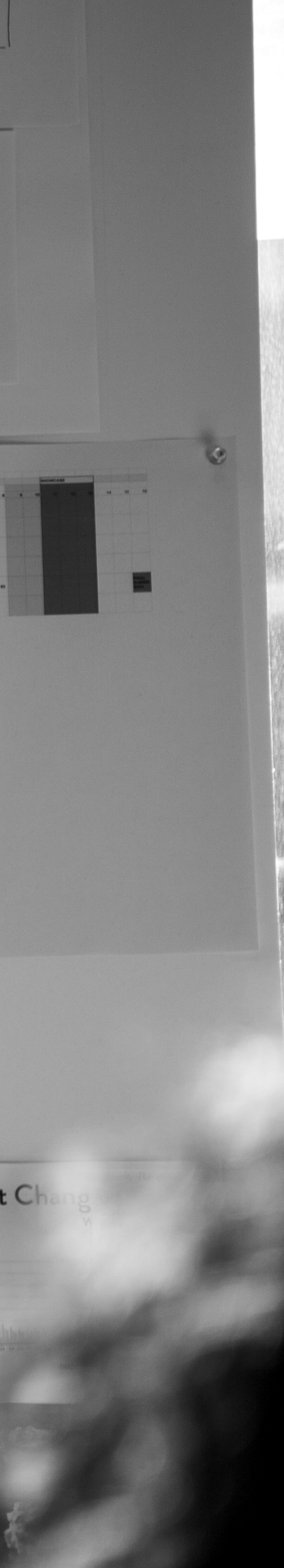
TAKEHOLDERS: Data Providers, Art&Design Community, Educational Institutes, General Public

SOCIAL IMPLICATIONS: Aside from working as a visual object, the outcome shapes of this project can also serve the purpose of raising public awareness to the social problems that need attention.

PRESS RELEASE: We reside within a sea of readily available information. Amidst the abundance of data, vital information can easily be overlooked. The challenge often doesn't lie in data generation, but rather in effectively presenting it. This project undertakes the task of effectively visualizing the often overlooked data by making it into a 3d model and potentially a tangible real-life object, ensuring it gains the attention it deserves.

This project scrapes data from the internet and generates 3d models based on the data. APIs are used to extract the available data from the source, which is then fed to an algorithm for generating 3d shapes. The algorithm can be developed using Rhino 3D and Grasshopper. Various types of data can be employed to create different aspects of the generated shapes, such as encompassing curves, numerical inputs for form features, textures, and more.

These models can dynamically respond to the change in the data in real-time, since they are automatically generated 3D models based on the data.





# CHRYSALIS

2023, Team Academic Project

## Biomimetics Soft Robotics Project

With soft robotics, this project mimics some aspects of mesmerizing natural metamorphosis process of a larvae turning into butterfly inside a pupae. After a series of transformations, such as the expansion, change of shape and color, it shows the beautiful wing pattern of an adult butterfly ready to break out of the chrysalis.

## TOOLS & SKILLS

- Fusion 360
- Arduino
- Silicon Casting





**CHRYSALIS**





**CHRYSALIS**





# Tesla Design Studio

2023 Summer, Internship

## Mechanical Engineer @ New Programs Engineering, Tesla Design Studio

I joined the New Programs Engineering team in Tesla Design studio at Los Angeles as a Mechanical Engineer for summer 2023.

My contribution was to coordinate the integration of future generation experience vehicle model. It included engineering of some functional exterior components and also rapid prototyping of new seat adjustment mechanism.

As internship capstone project, I researched and designed a 6 degrees of freedom motion platform mechanical system, resulting in a 3D design ready for production.



TESLA