Diego Yañez-Lagunas

Portfolio

August 2024

Sequencer Clock

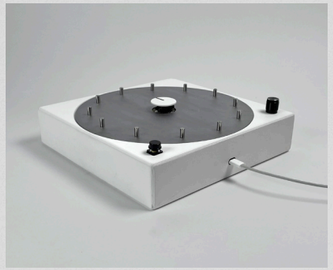
A MIDI instrument inspired by clocks and how we experience time. It provides an alternative way of making music by ditching the conventional linear interface and quantization of traditional beat sequencers.

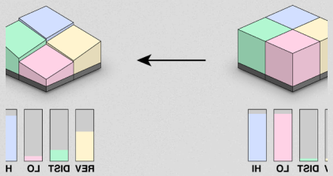
SKILLS

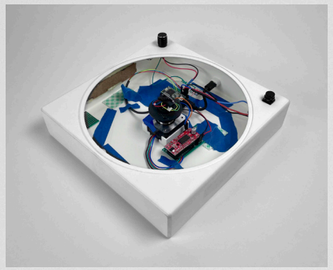
Electronics
Programming
Interaction Design
Fabrication

TOOLS

Arduino
Distance Sensing
Motors
MIDI + Garageband
CAD
3D Printing
Laser cutting







VIDEO LINK

HOW IT WORKS

A distance sensor located in the center spins around so that it is able to detect the presence of magnets placed on the clock face. The distance of each magnet to the center is mapped to a MIDI parameter (volume, pitch, or instrument sound), depending on which mode the clock is in. The knob controls motor speed, therefore tempo.

Squish is a

squishable

modular

MIDI controller

BACKGROUND

Despite the growing popularity of digital music instruments (DMIs) and relevant technological advances, accessibility and expressive potential remain significant challenges for musical interface designers. These issues stem from generic input-output mappings, sensor limitations, and a lack of physical connection between musicians and instruments. *Squish* explores the benefits of incorporating soft materials into musical interfaces and why DMIs should be designed with musician-instrument relationships as a priority in order to enhance intuitiveness and expressiveness.

Squish is a set of foam blocks embedded with custom pressure sensors, which encourage tactile interaction and give the user nuanced control over various musical parameters. The modular design of the foam blocks allows for versatile configurations, enabling users to control multiple parameters simultaneously with simple, but responsive gestures.

Squish

SKILLS

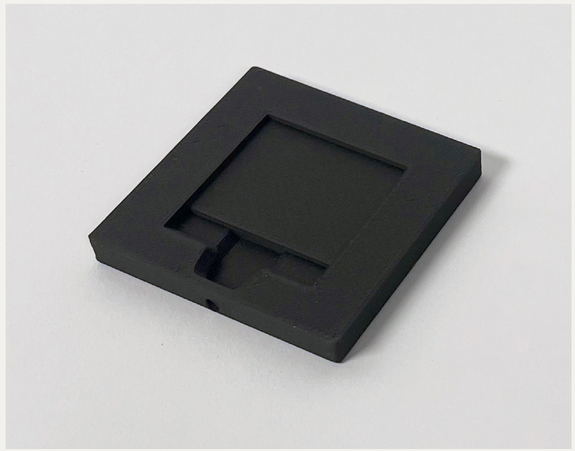
Electronics
Programming
Interaction Design
Fabrication
Sound Design

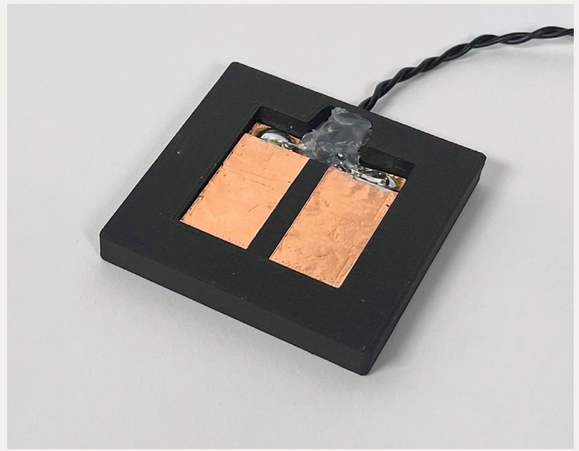
TOOLS

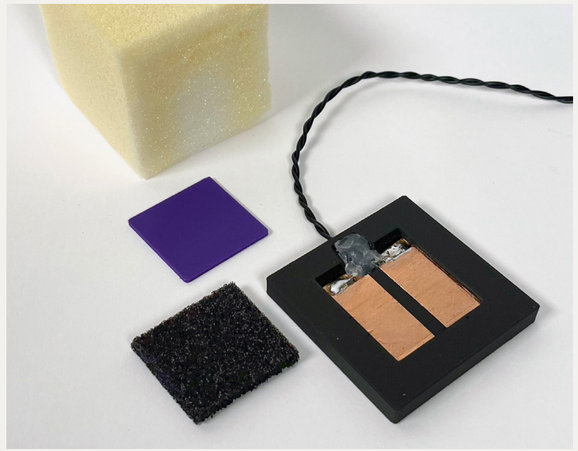
Python
Arduino
Force Sensing
Pure Data
CAD
3D Printing

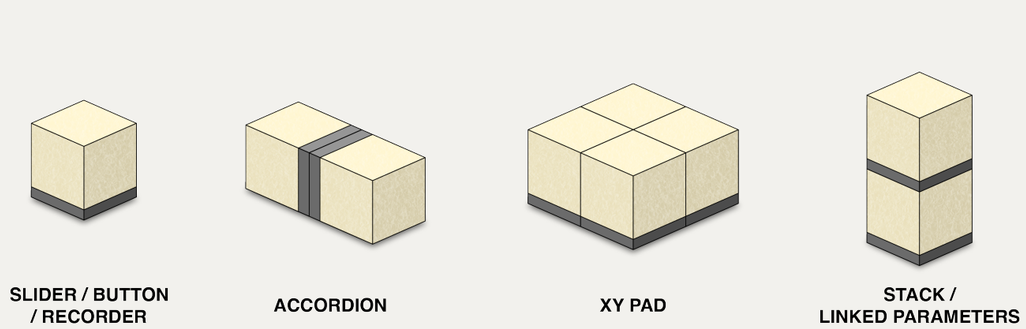
HOW IT WORKS

Compressive force is transferred from the yellow foam blocks to a small piece of velostat foam, which connects two pieces of copper tape. The velostat's resistance varies with pressure which allows applied pressure to be digitally read with an ESP32. These readings are then converted into MIDI messages that can be mapped to any parameter or trigger.

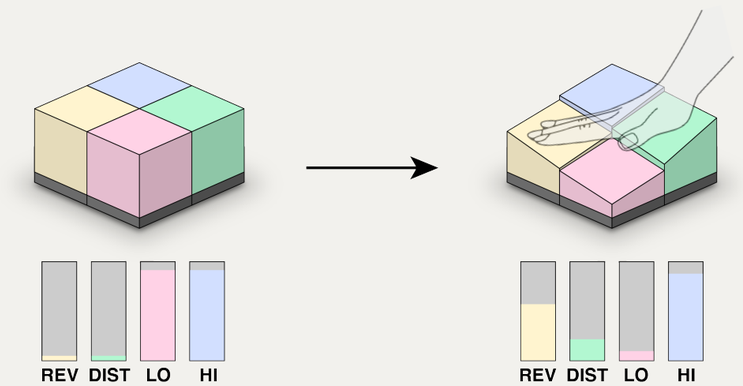








Potential Configurations



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BEATFARM

Beatfarm is a beginner friendly tool for learning how to make hip-hop beats and sampling. Pre-programmed patterns can be mixed and matched while also introducing users to different styles of hip-hop. Beats can be further customized by recording your own sounds for each instrument.

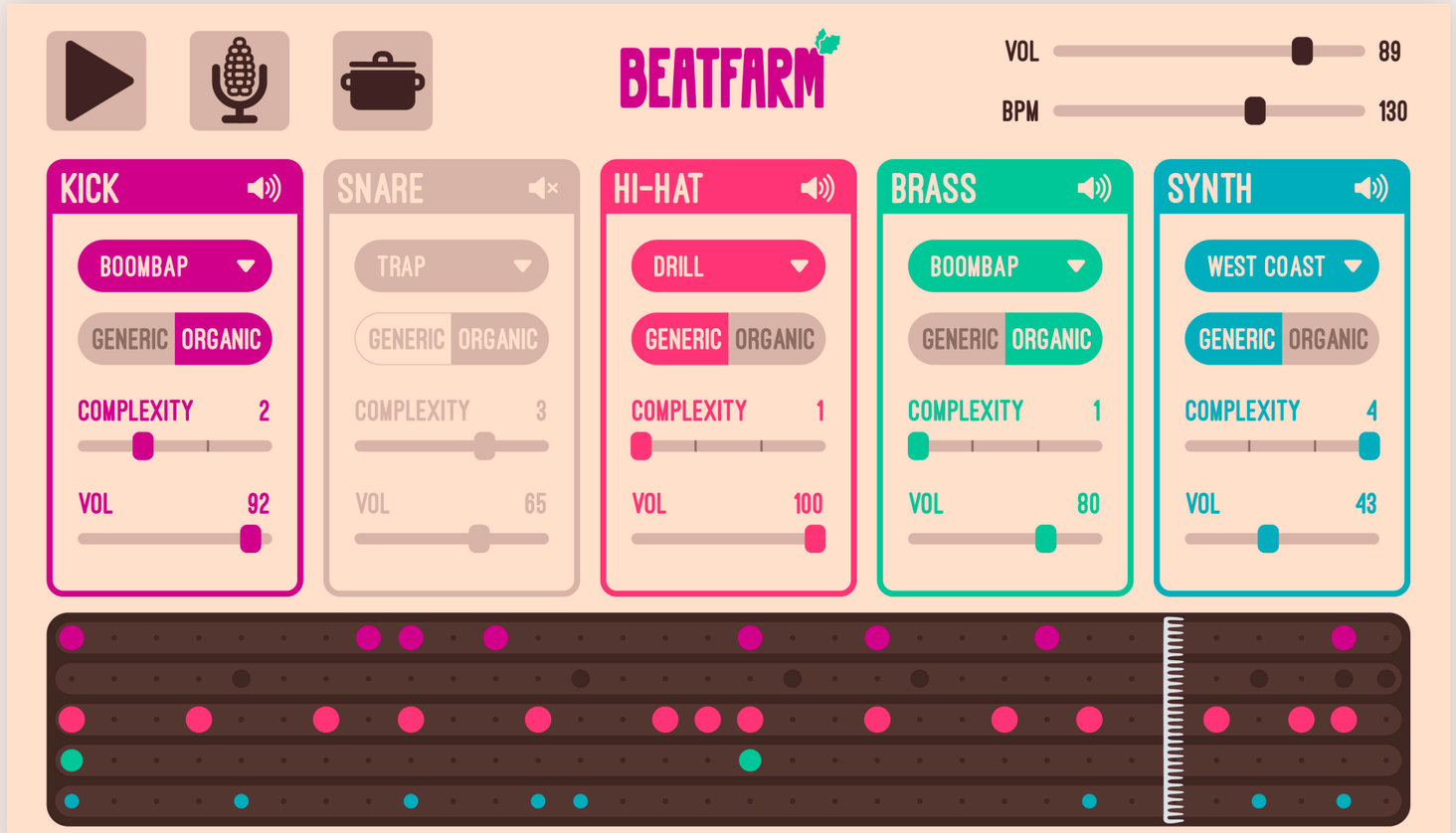
Collaborators / *Lucy Kim & Collin Wen*

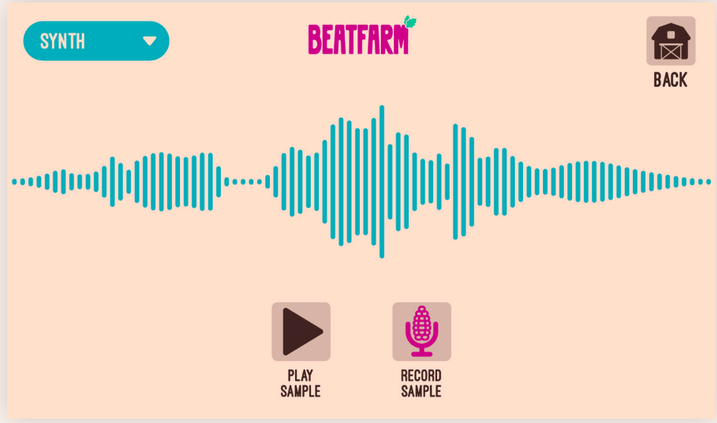
HOW IT WORKS

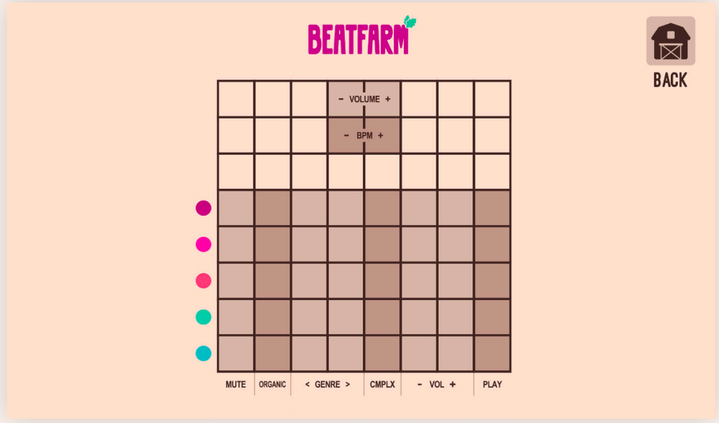
Database / Stores samples and rhythmic patterns
Sound Processing / Samples are mixed and modified using Pedalboard library
Frontend / Includes user controls for live production and sampling, as well as a display
Hardware / Users have the option to control the system with an external launchpad

SKILLS

Figma
Python
Kivy
Adobe Suite







21M.080 Web Synth

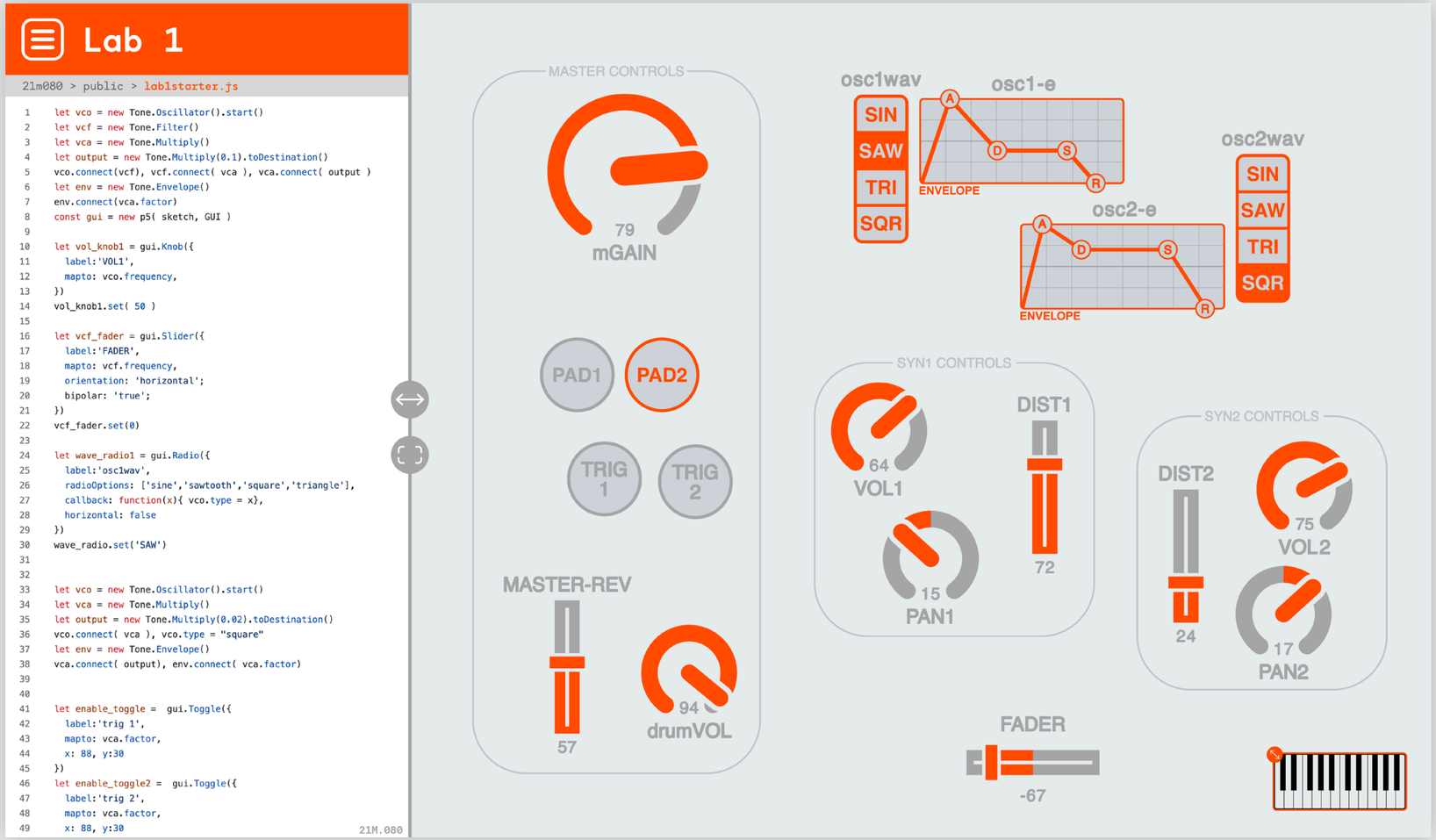
I designed a customizable, drag-and-drop GUI system using p5.js and the Web Audio API. Users can create UI elements with live-coding and specify different functional and aesthetic settings for each element. These elements appear in the GUI and can be interacted with and reorganized by dragging around.

This interface was used for an introductory music technology class at MIT where students used the GUI to quickly prototype and build digital synth systems.

Supervisor / Ian Hattwick
Collaborator / Kayli Requenez

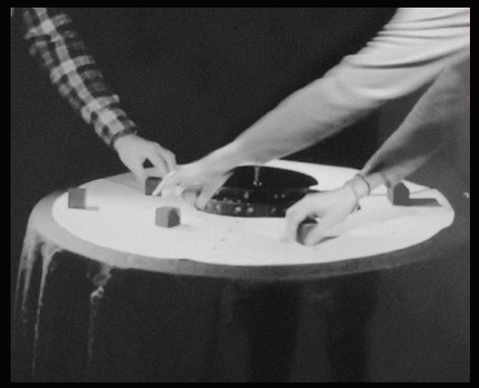
SKILLS

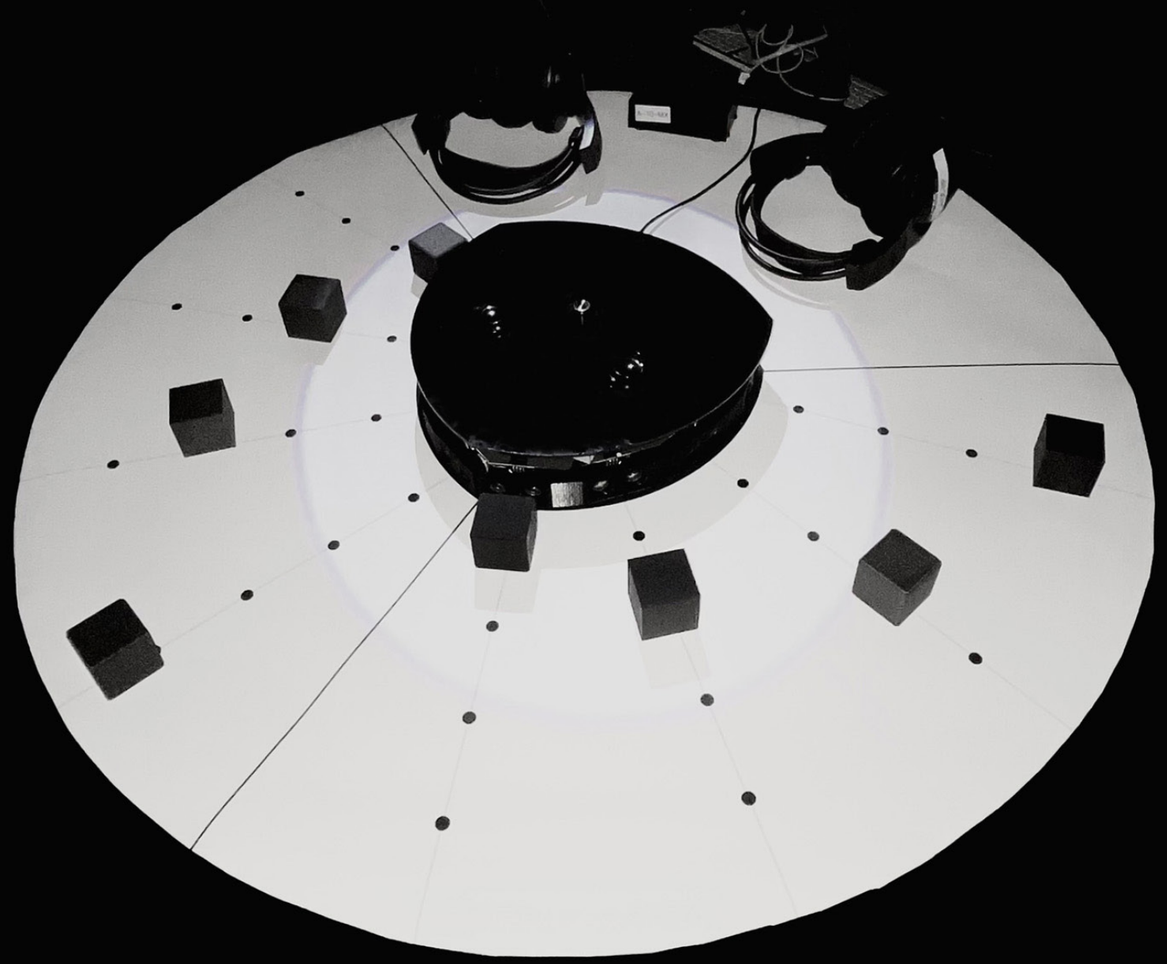
Figma
HTML/CSS
JavaScript
p5.js
GitHub



Tangible Sampling

An installation that encourages collaborative music-making through playful and tactile interaction inspired by hip-hop sampling.
Previously displayed in the MIT List Visual Arts Center.





SKILLS

Electronics
Programming
Installation Design
Fabrication
Sound Design

TOOLS

Arduino
Distance Sensing
MAX/MSP
CAD
3D Printing
Laser cutting
Adobe CC

HOW IT WORKS

The music is made up of a drum track and a melodic track, with each track being controlled by their own set of four blocks. Each block represents 1/4th of a sample and the position of the blocks determines in what order the sections of the sample are played. Moving the blocks around resembles the chopping and looping techniques used by hip-hop producers. Users can also press buttons to change the drum or melody sample and can also use a knob to change the speed of the samples or even play them in reverse.

FORTING

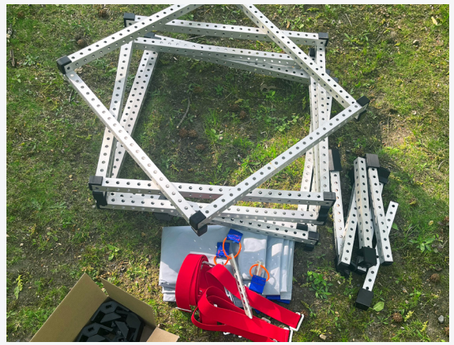
Forting is a kit of parts inspired by the idea of outdoor pillow forts. The kit includes metal struts, 3D printed adjustable joints, waterproof tarps, stakes, and hookable elastic bands. Users can choose how to combine the parts and the kit is designed for easy assembly/disassembly to promote customization and play.

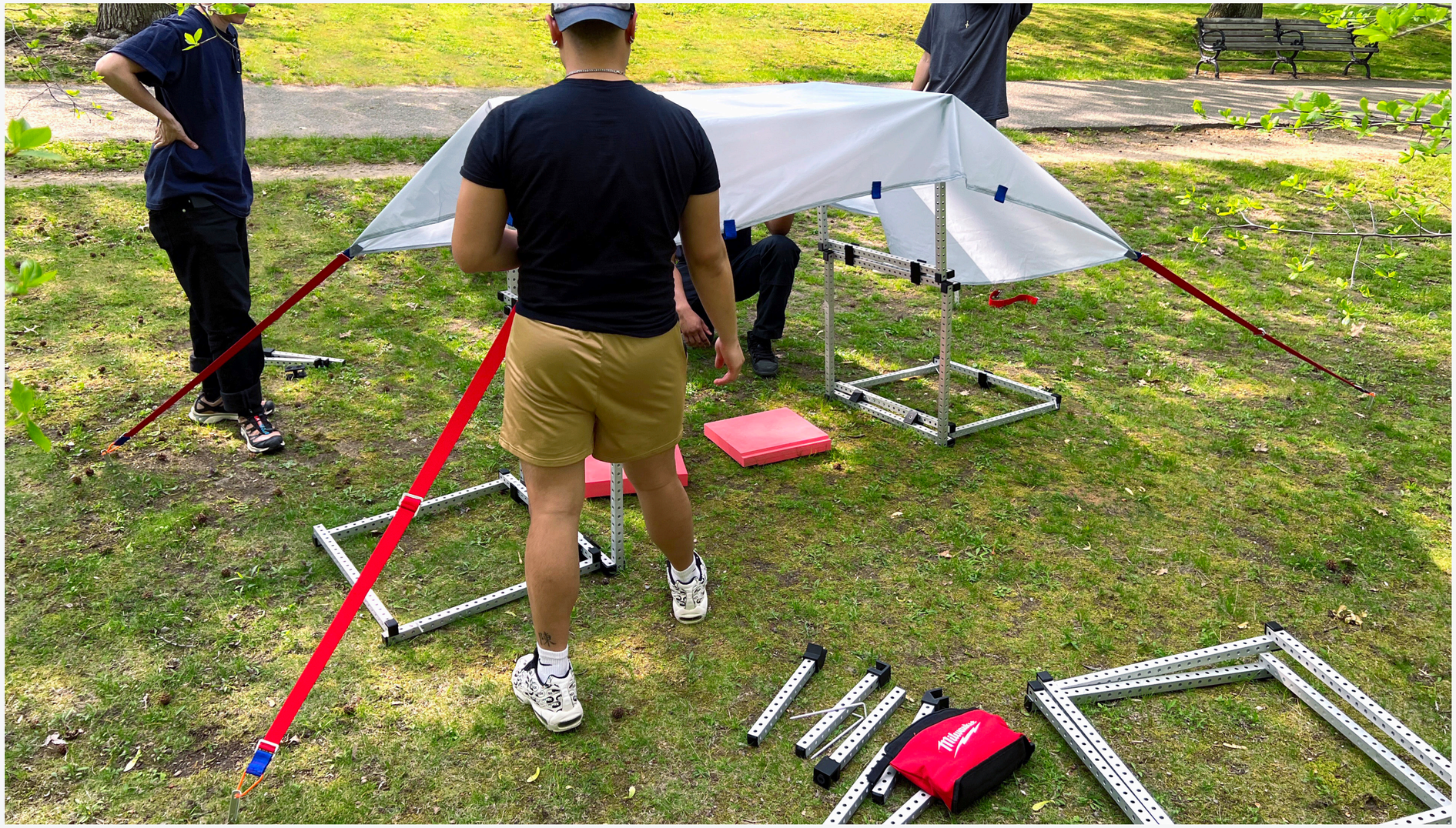
SKILLS

Physical UX Design
Metal Fabrication
Sewing
Rendering
Rapid Prototyping

TOOLS

CAD
3D Printing
Laser Cutting
Adobe CC





FORTINO

metal struts can be connected to create square **FRAMES** ...

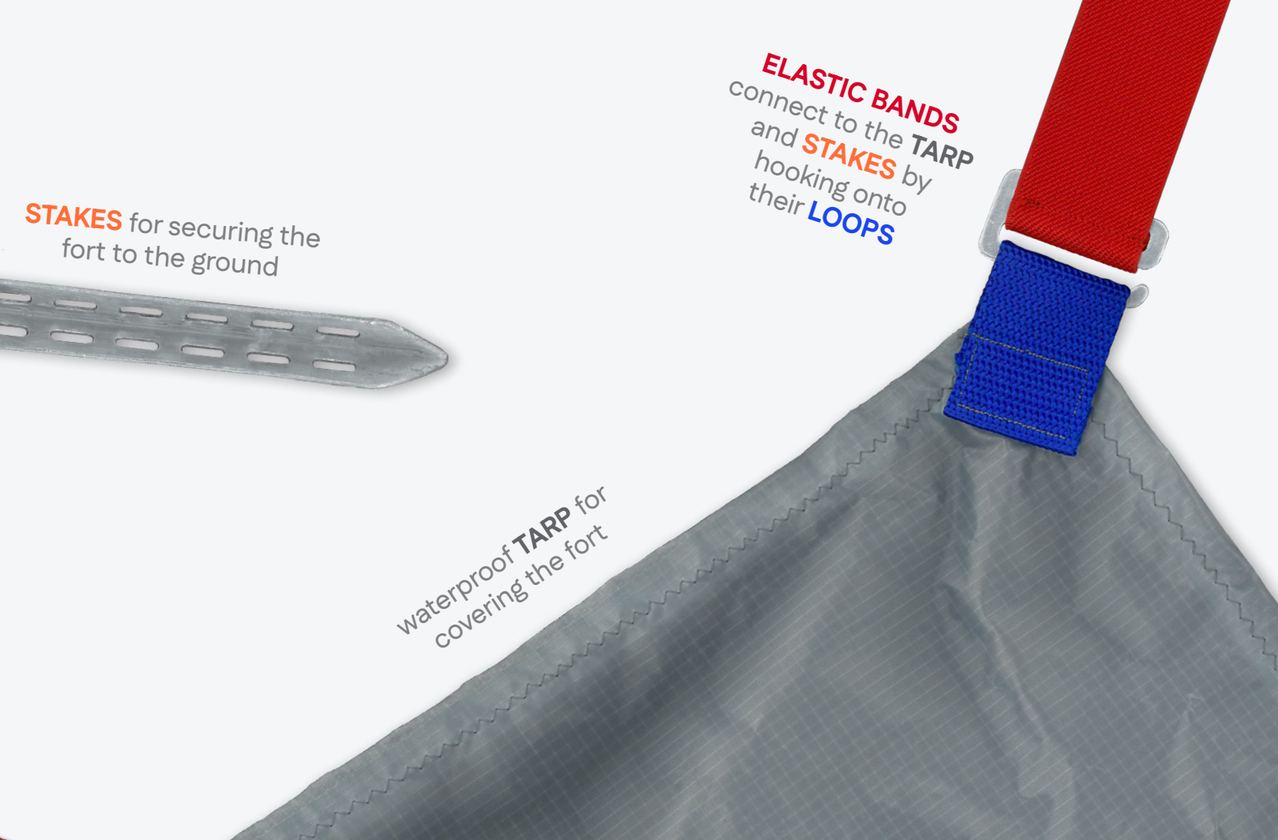
FRAMES can be connected to each other with an adjustable **CLAMP**

... or attached as extensions to the structure by using a **CONNECTOR** with a built-in screw

STAKES for securing the fort to the ground

ELASTIC BANDS can be extended by connecting them to each other

ELASTIC BANDS connect to the **TARP** and **STAKES** by hooking onto their **LOOPS**



waterproof **TARP** for covering the fort

Thank You!

You can see more of my work on my online portfolio:

diegoyl.com