

BATTLE OF INFECTIONS

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MIT 4.044 Design Studio: Interaction Intelligence

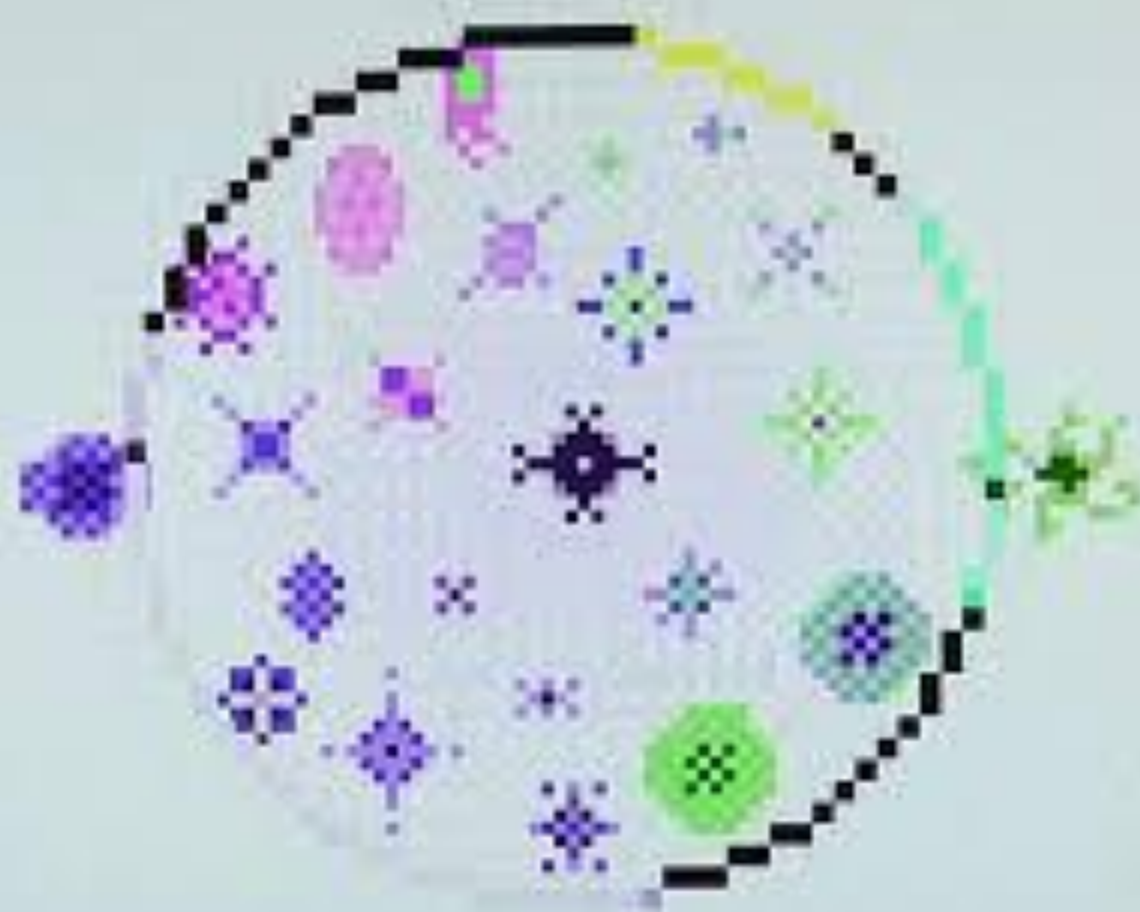




[Battle of Infection] is a **1D territorial battle game** that transforms the **act of coughing** into an interactive gameplay mechanic.

Inspired by a microscopic exploration of what happens after a cough, players embody viruses competing to infect a circular ring of cells. The game is controlled through a wearable joystick—a futuristic mask interface that tracks player actions: coughing triggers bacteria attacks, while hand gestures near the face steer the direction of movement. By merging body-driven interaction with real-time strategy, the game reimagines both control systems and biological metaphors, turning an involuntary human action into a dynamic, competitive experience.





Inspiration : WetLab Mycelium Growth



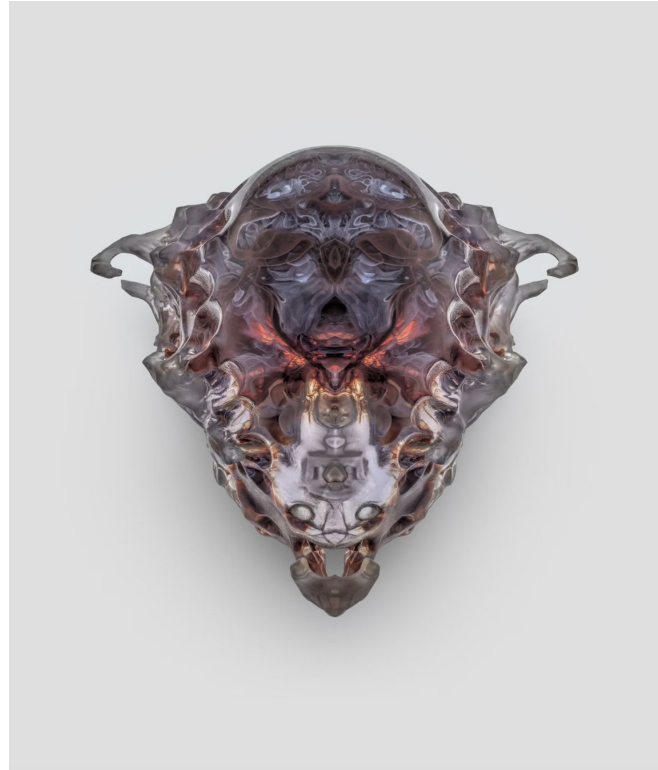
Bacteria growing - territory fight



References: Body as interface



OXMAN "Vespers"



Fashion Design & Aethetics References



Maison Margiela's masks
Fashion Textile - Wearable Devices



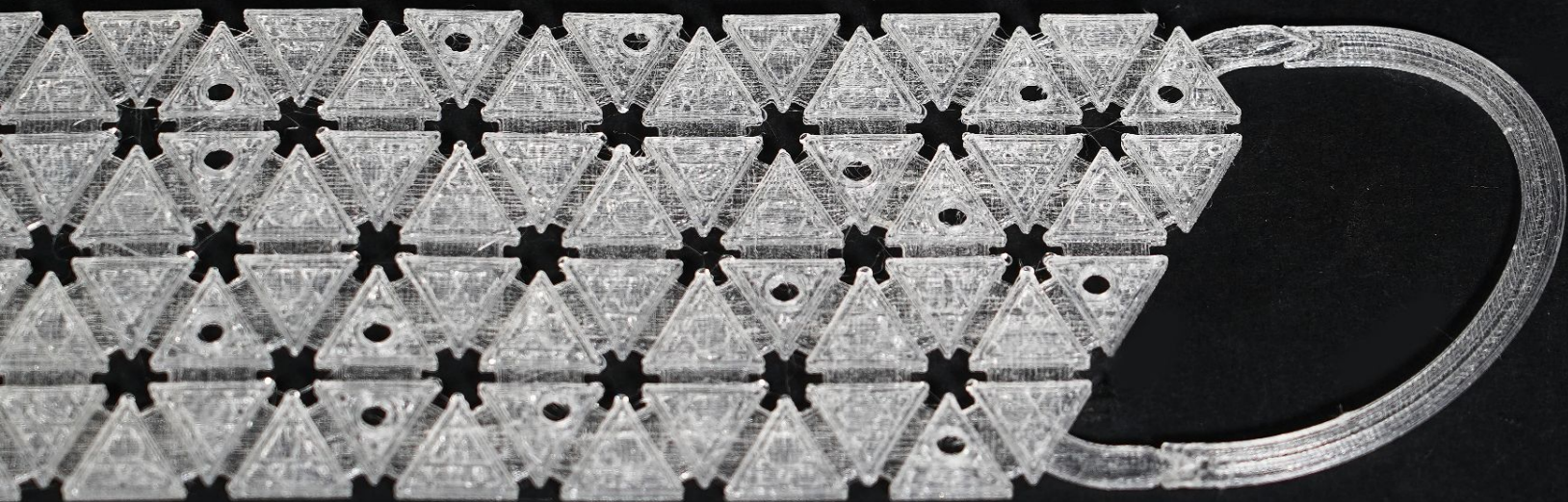




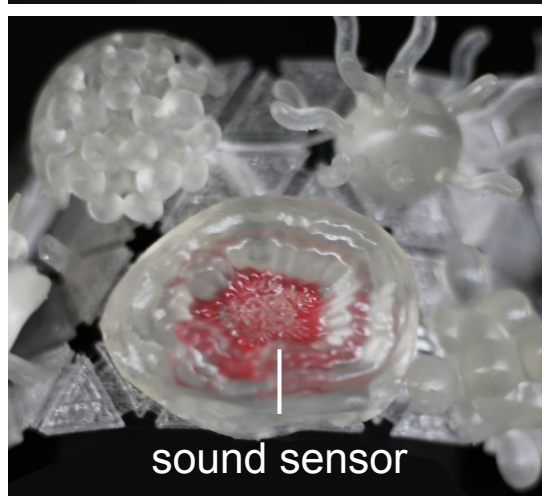
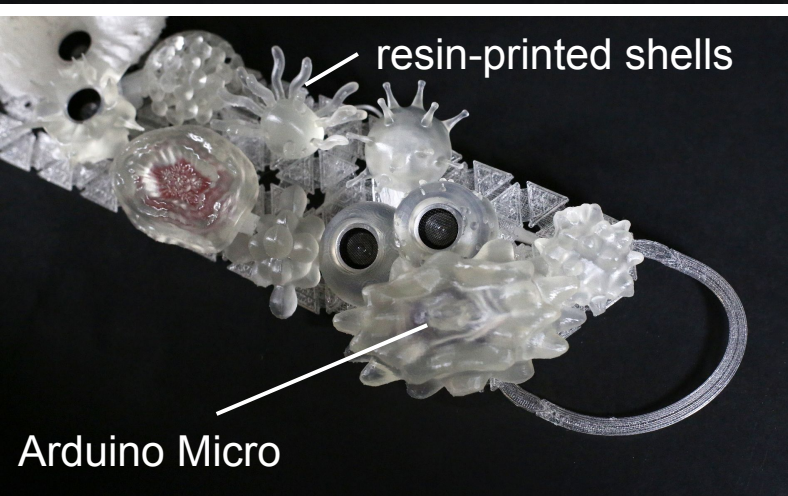
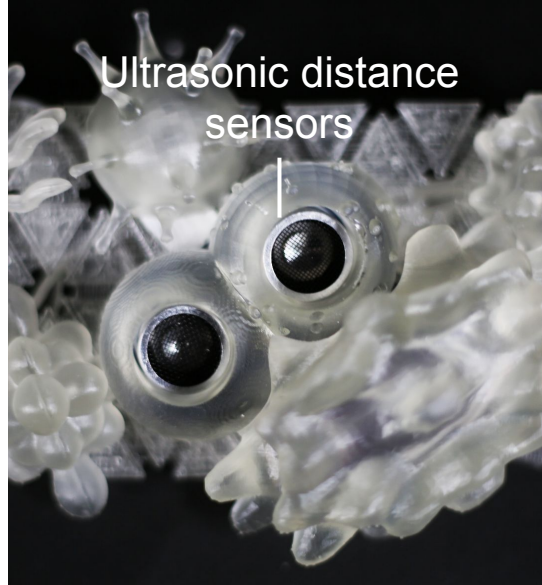
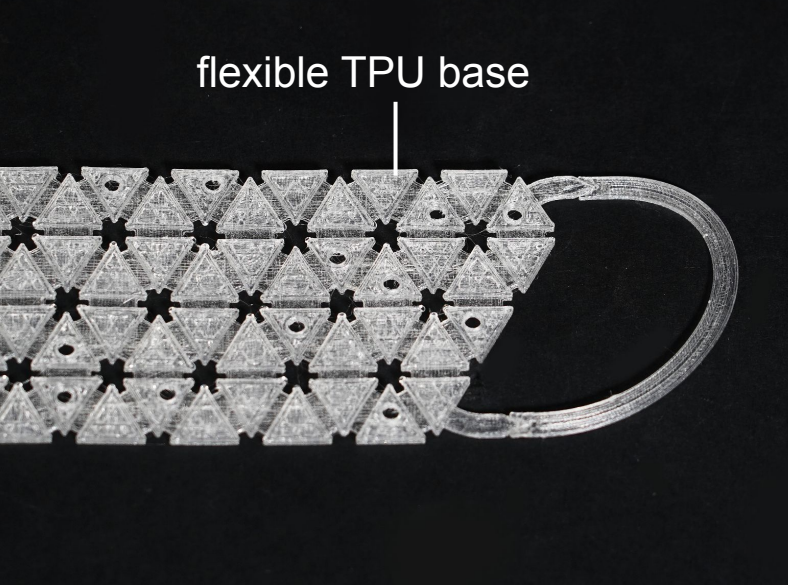


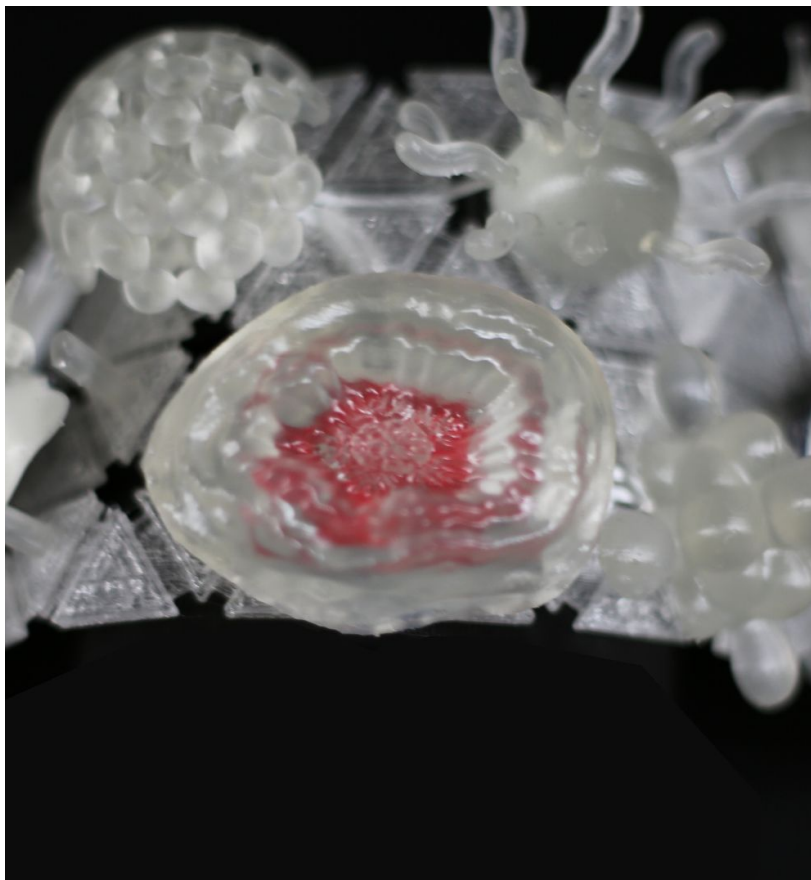






Mask Base





Sensor encapsulation



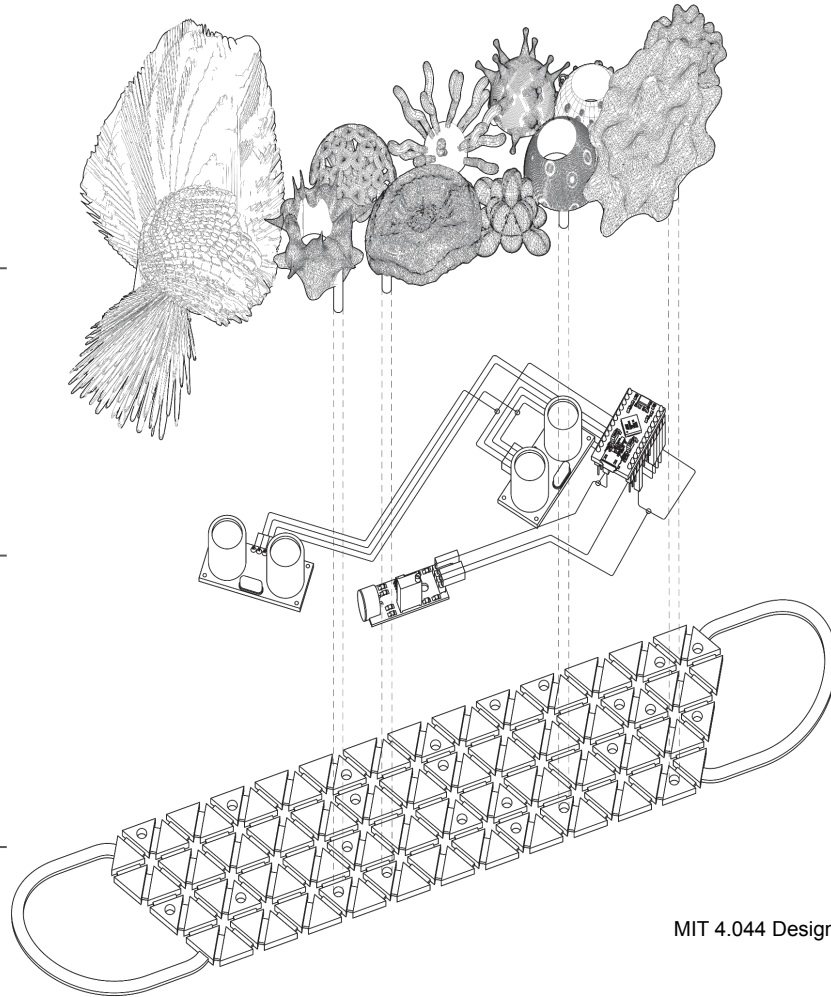
Technical Drawings and Design: Mask

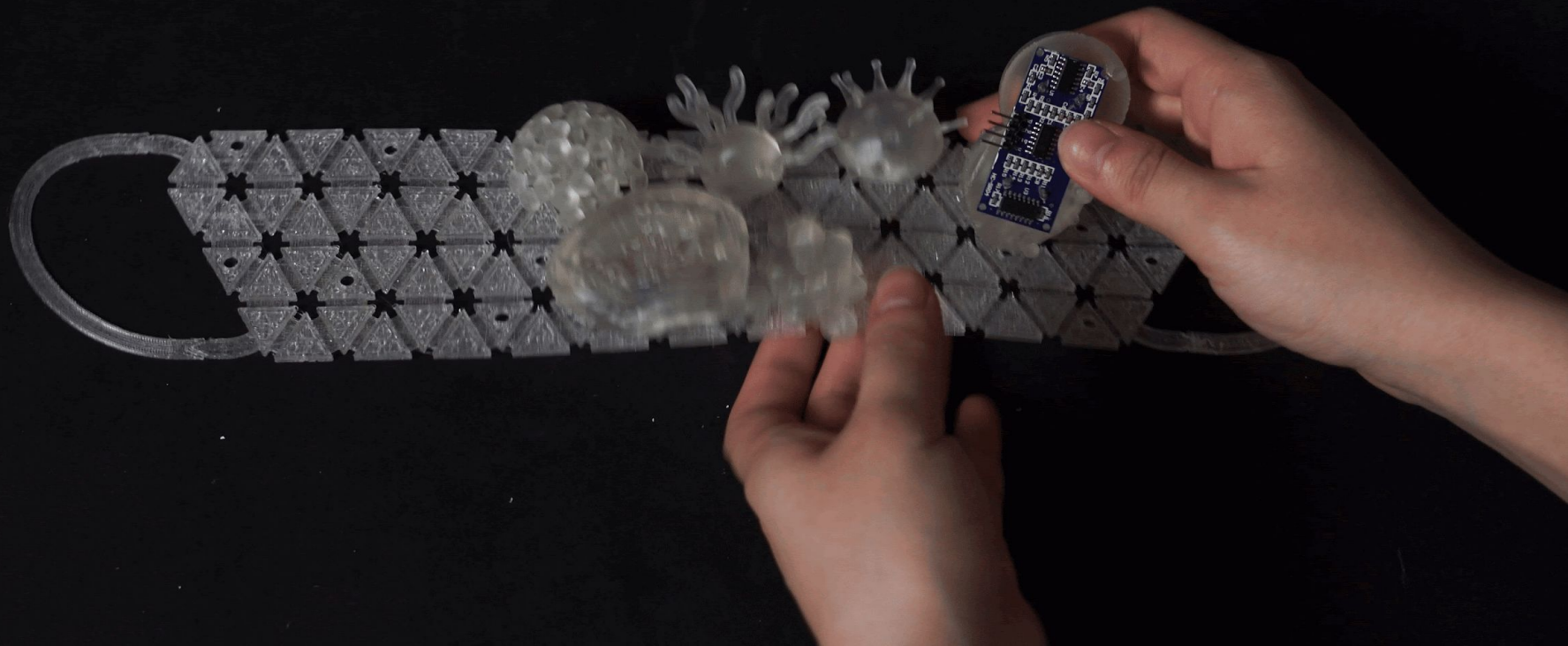
Upper Layer:
modular virus models (resin)

Middle Layer:
sensors and wires

sound detection sensor x 1
ultrasonic distance sensor x 2
Arduino Micro x 1

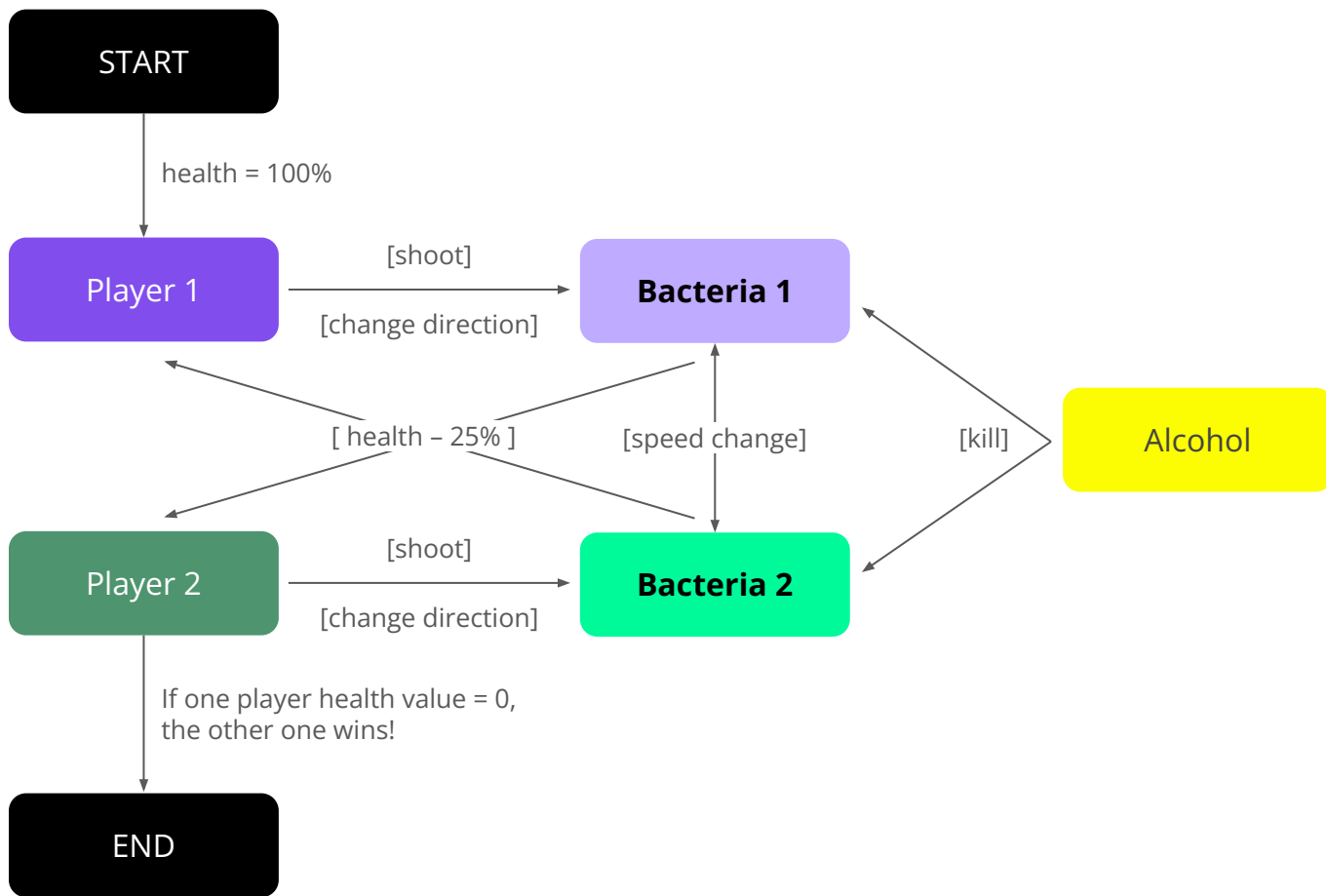
Bottom Layer:
mask (TPU)

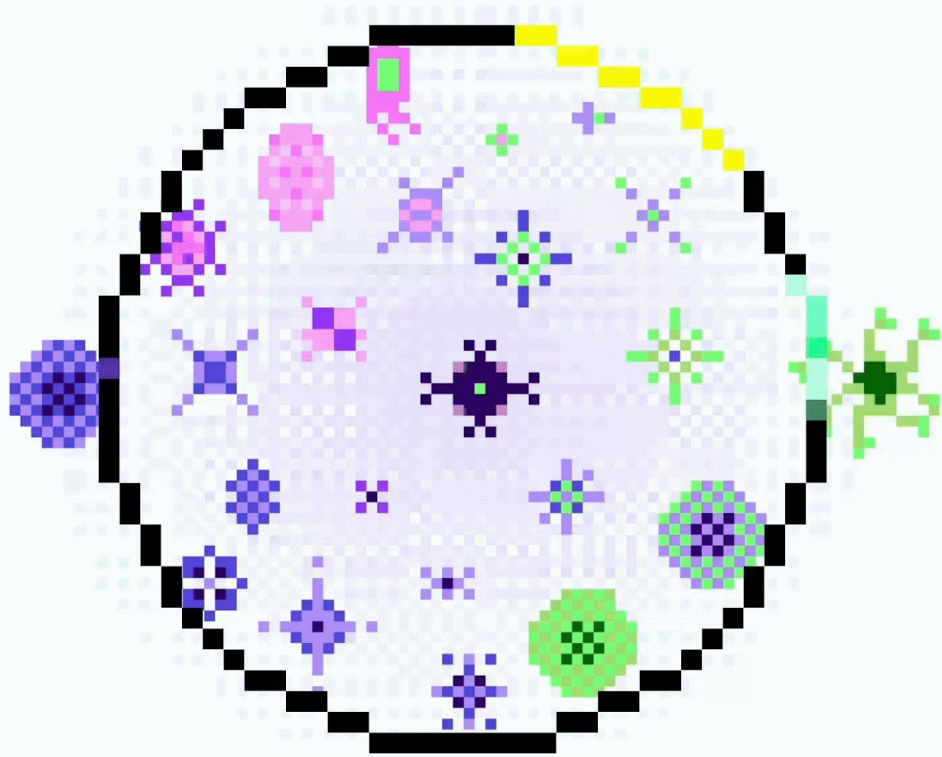












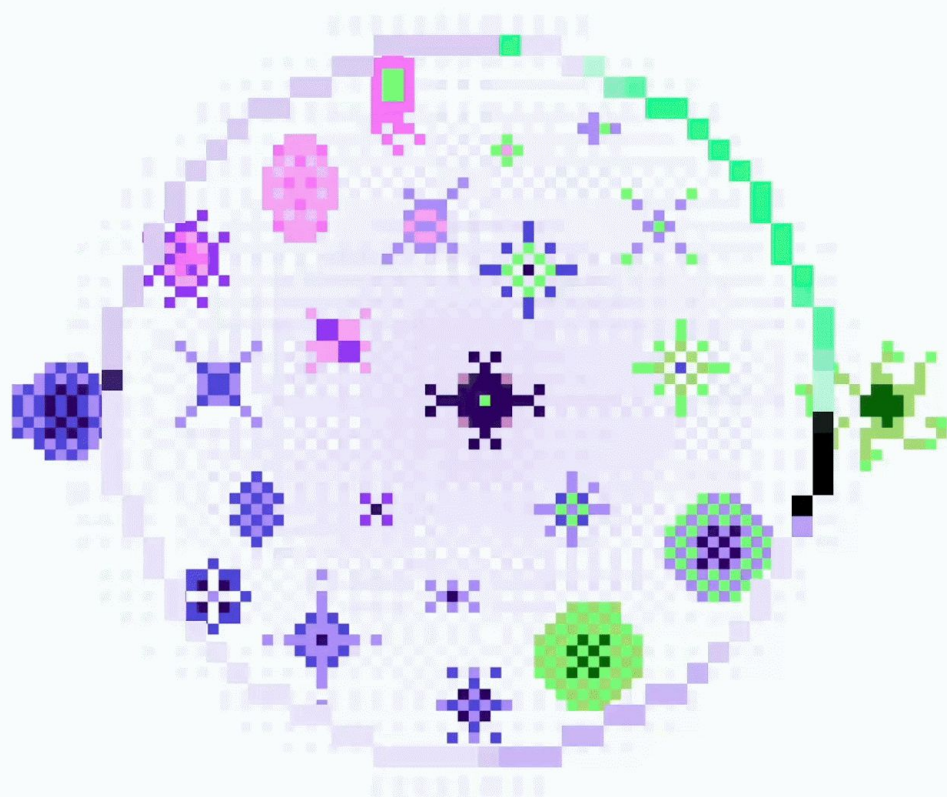
Game Design

Shoot out bacteria





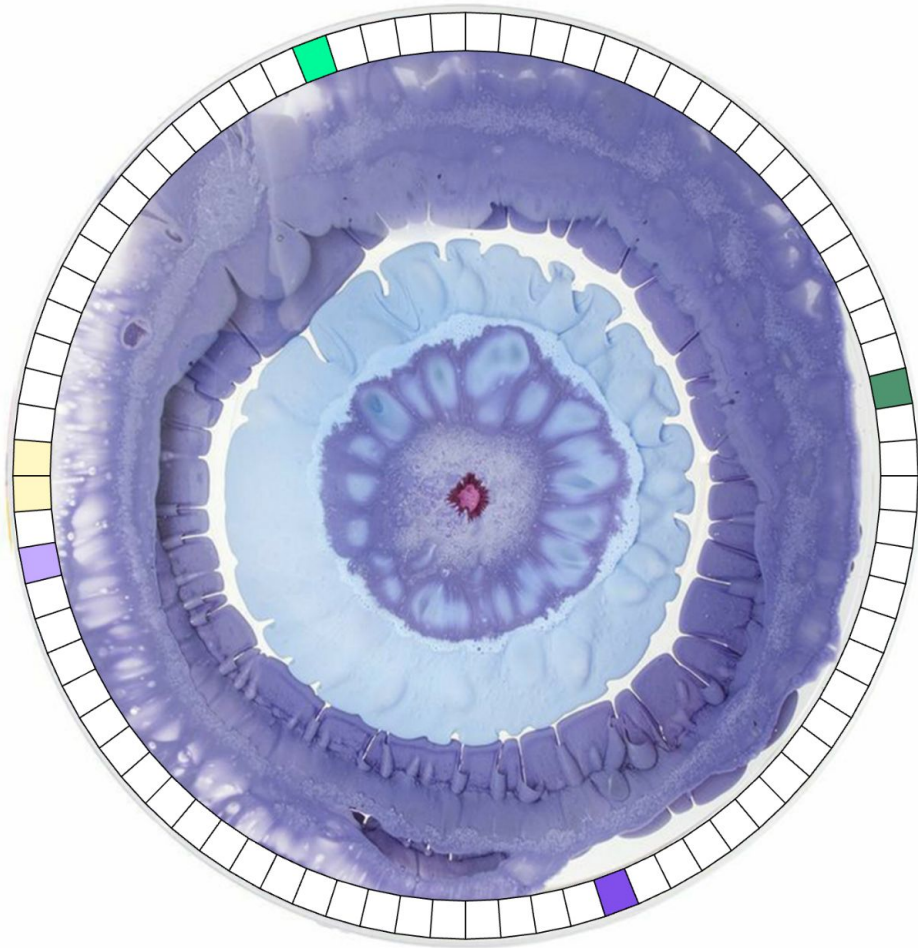
randomly appearing alcohol
that kills bacteria

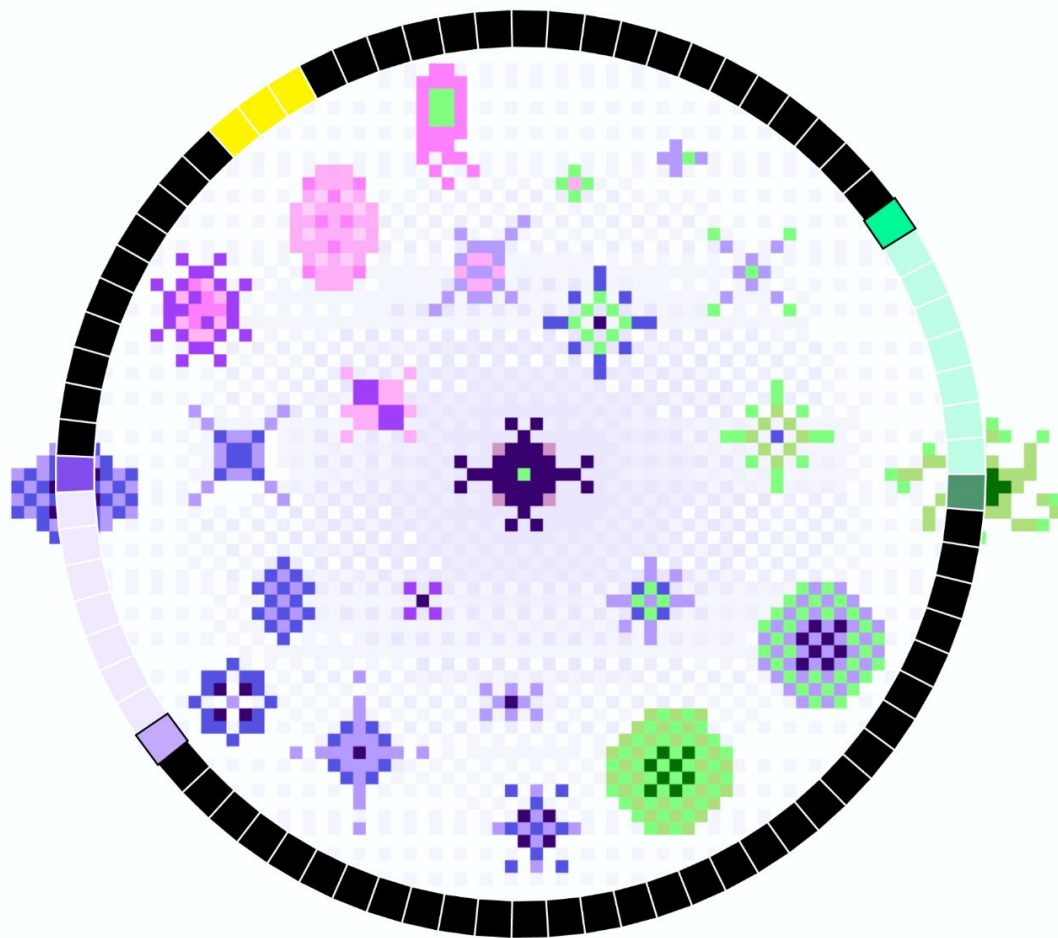


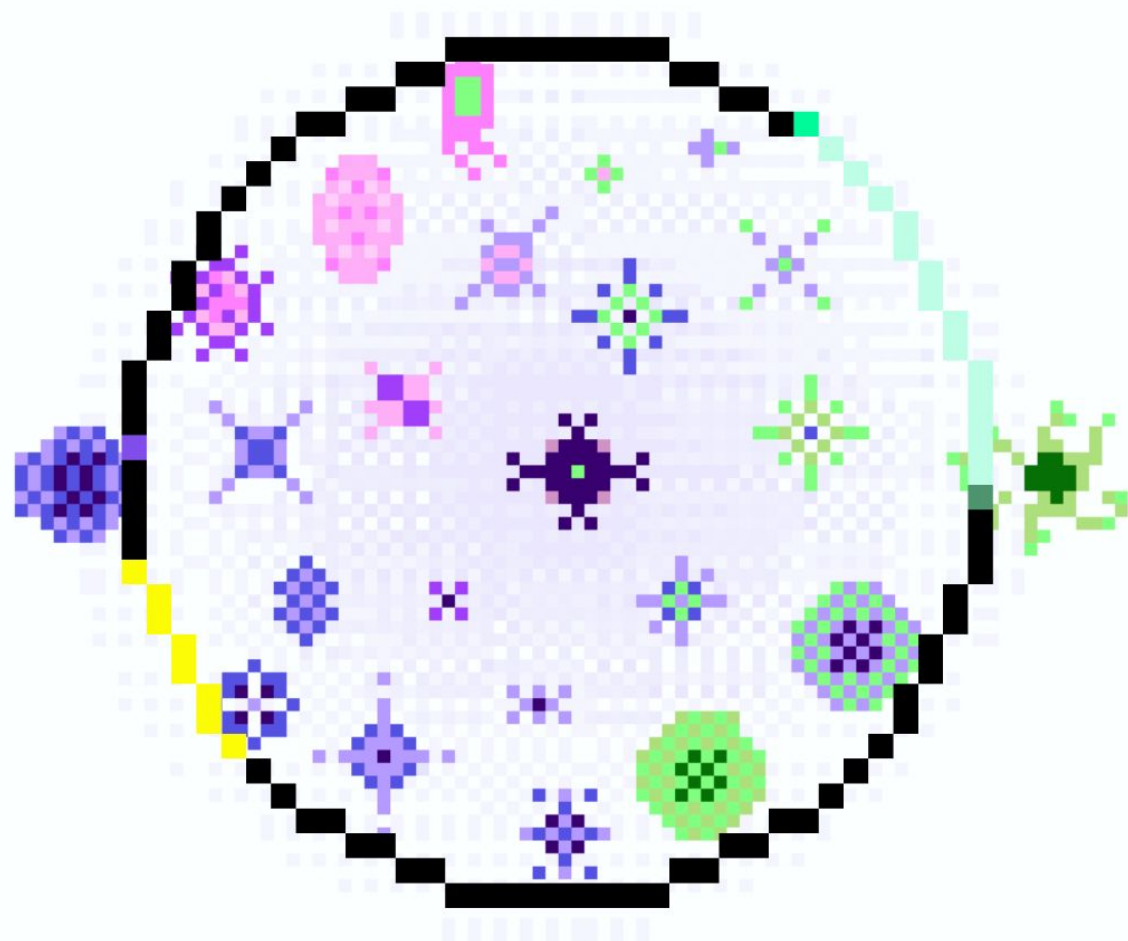
End Game Visual

Design Process

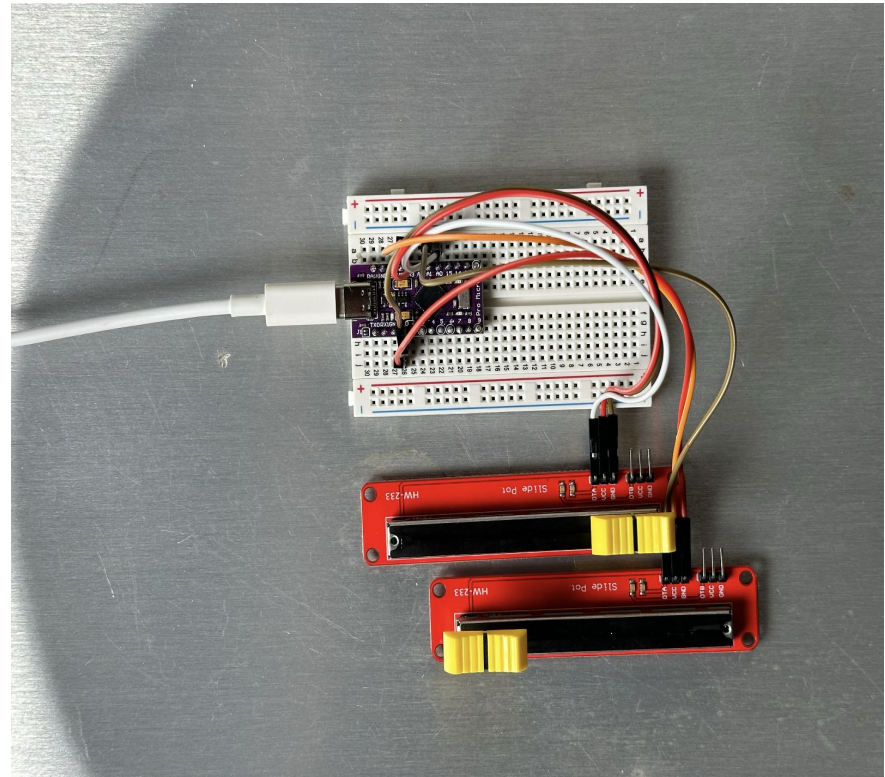
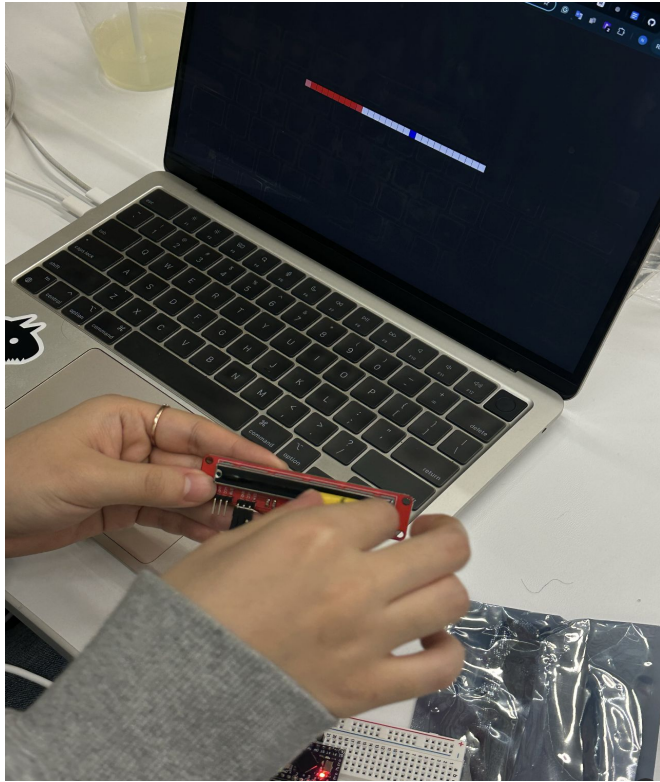








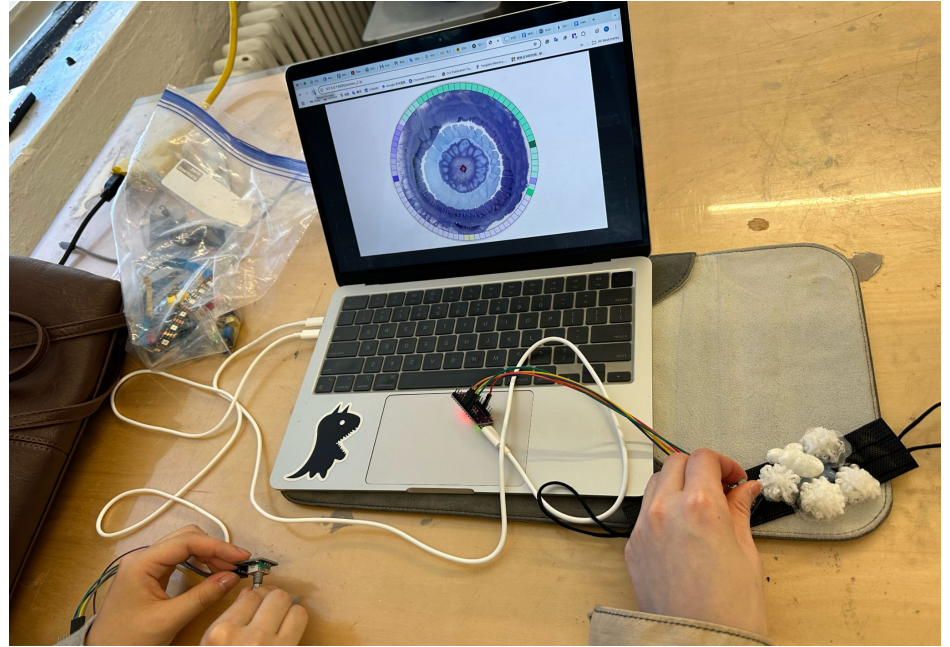
Prototype 1: Linear 1D territory invasion game with Slider



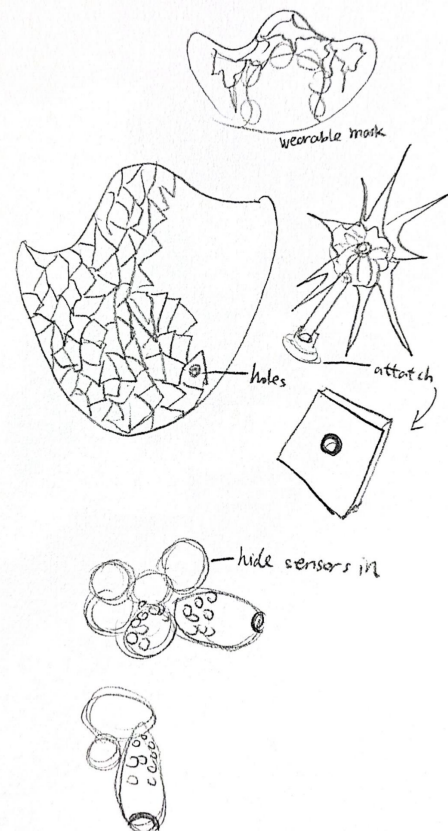
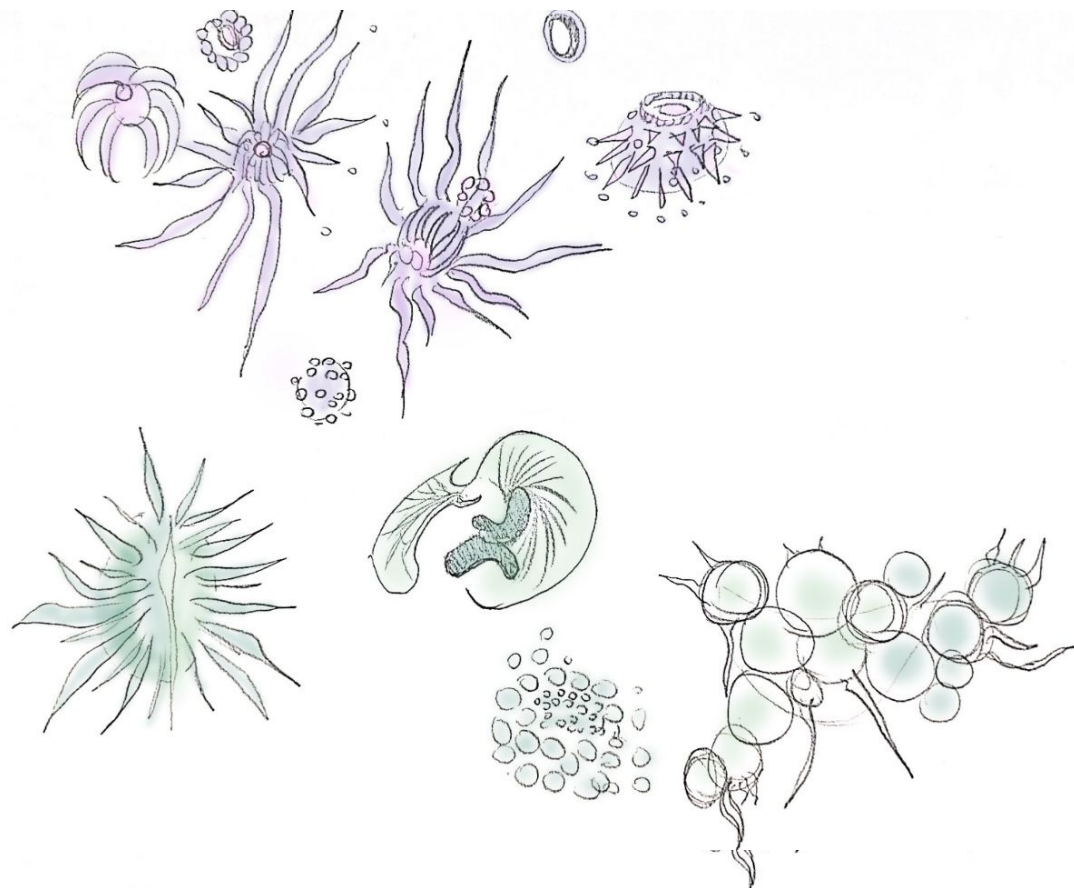
Prototype 2: Wearable
1D territory invasion game with Rotary Encoder



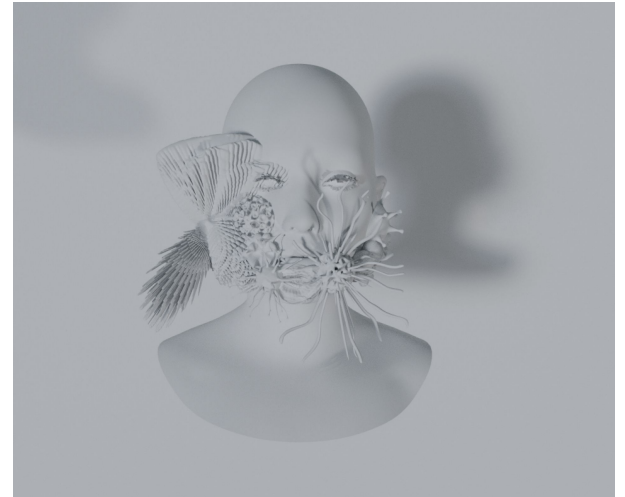
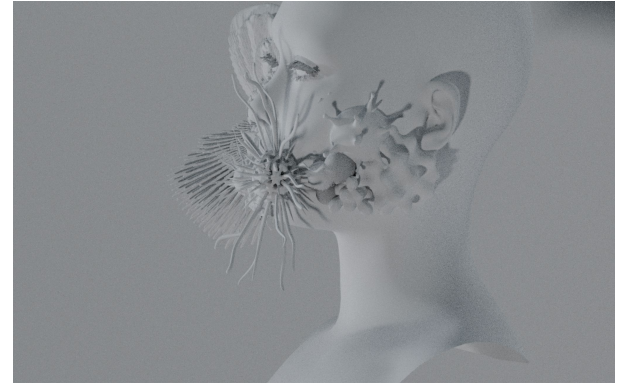
Prototype 3:
mask with 3D print virus



Sketches



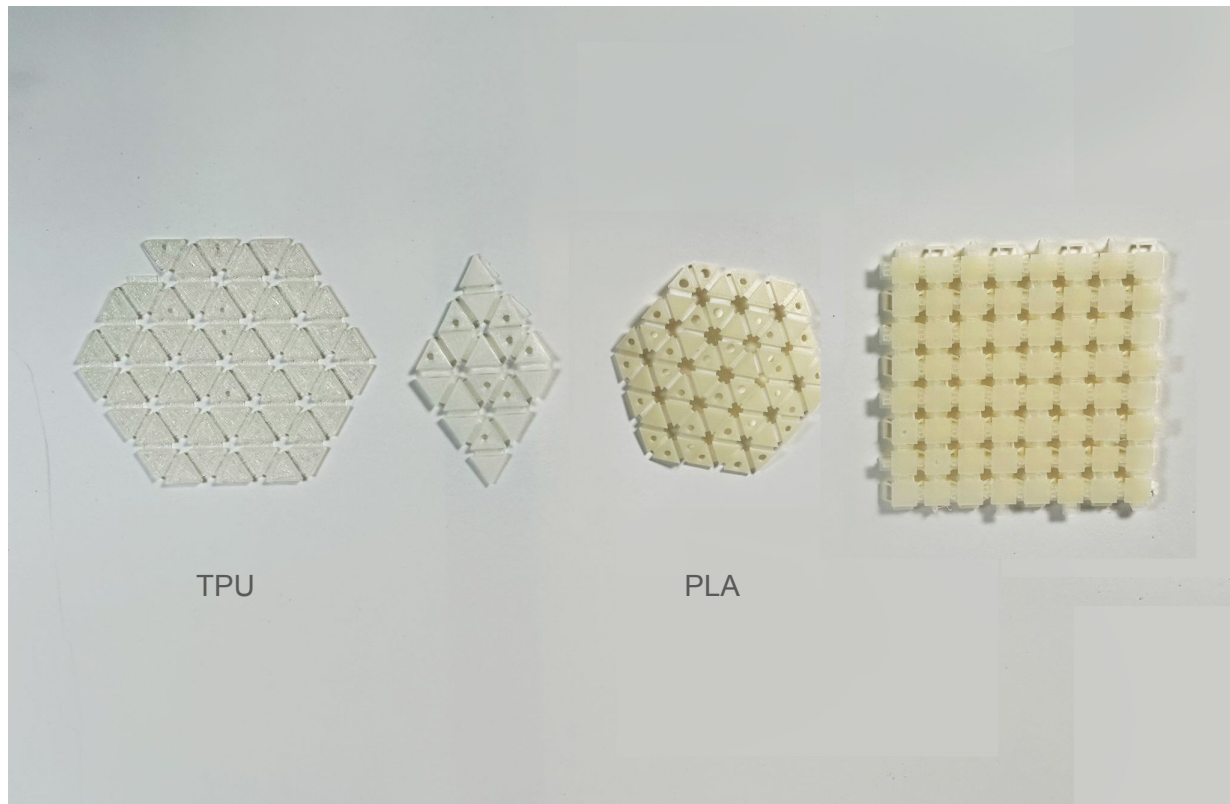
Conceptual Design







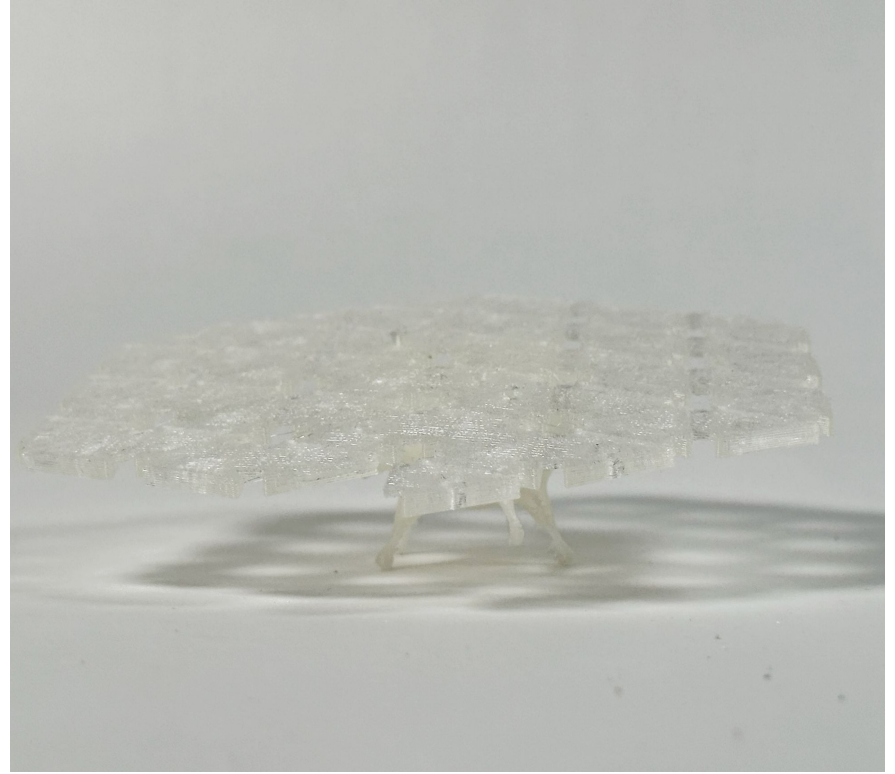
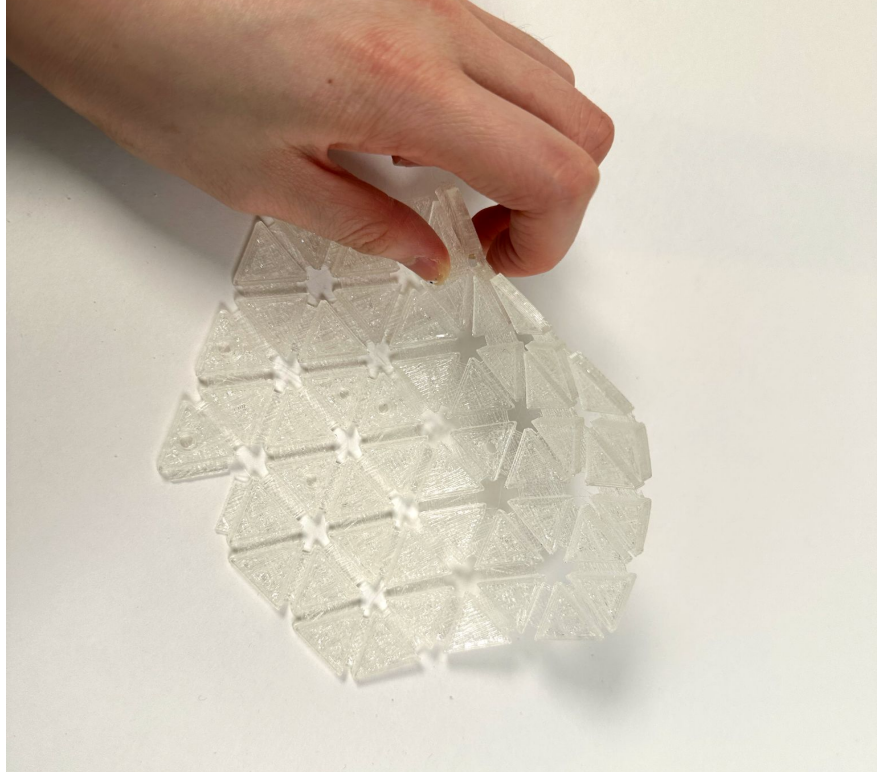
Fabric 3D Printing Experiment



TPU

PLA

Fabric 3D Printing Experiment





Bag of Failed Printes :(





Lessons Learned

Design Process: Iteration is very helpful ! for both front-end interface and our joystick design and fabrication

Fabrication: Unlike typical handheld joysticks, design and fabrication of a wearable joystick is a whole new story, there are more factors to consider, such as aesthetics, texture and softness(no harm to our skin), etc.

HCI in General: As computing devices keep evolving, new ways of interacting with them emerge—voice, gestures, haptics, and more. Our experiment in harnessing everyday acts (like coughing) invites a larger question: What if we use organic, inherent human behaviors to communicate with machines?

Special thanks to Marcelo, Bill and Quincy to
make the 'impossible' 3D printing happened.

THANK YOU!

