Bazeed & Jun:

SSRI Research

With Professor Lee and Professor Boggia

02.

ABOUT US

Rachel Boggia

Associate Professor of Dance & Chair of the Department of Dance

S. James Lee

Associate Professor of Computer Science

Bazeed Shahzad

Lee's Student Researcher & Ammerman Scholar

Junyi He Wu

Lee's Student Researcher & Ammerman Student

03.

Our SSRI Research Projects

Posture Portrait Project (PPP)

The Posture Portraits Project (PPP) is an interdisciplinary exploration of how bodies were historically shaped through scientific interventions and surveillance, while also addressing inclusivity. By examining the development of healthism and its ties to the U.S. eugenics movement, specifically through the use of posture portraits taken at universities from the 1920s to the 1960s, the project aims to critique discriminatory practices and promote a more just society through technology and the arts.

Visualizing the Breath

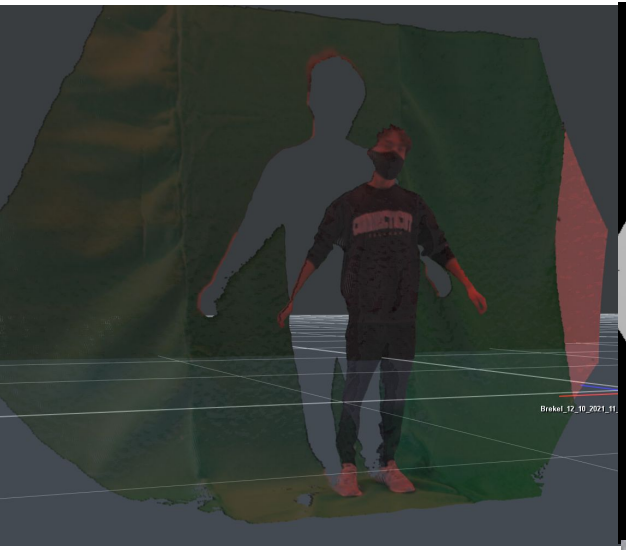
[tentative title]

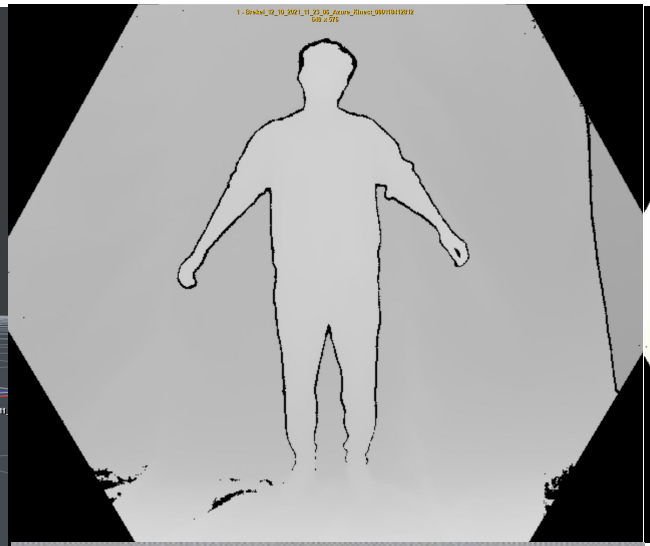
An immersive installation or VR experience in which the audience can draw/paint in 3D utilizing their breath.

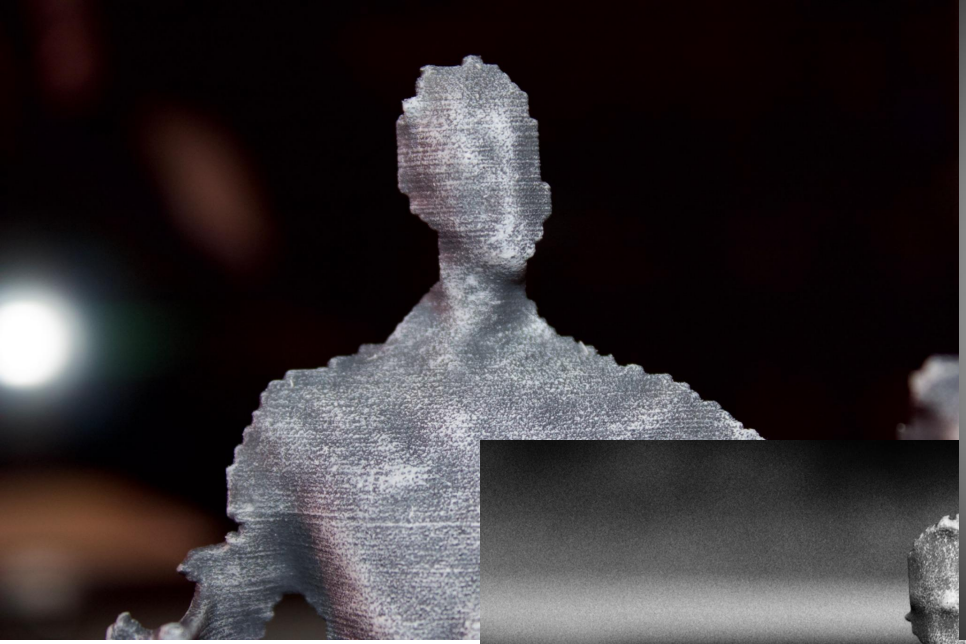
After the COVID-19 pandemic, many of us have developed a fear of others' breath, even holding our breath around others to avoid infection. The goal of this project is for audience members to heal their relationship with breathing by creating something beautiful and playful using the breath in a safe environment.

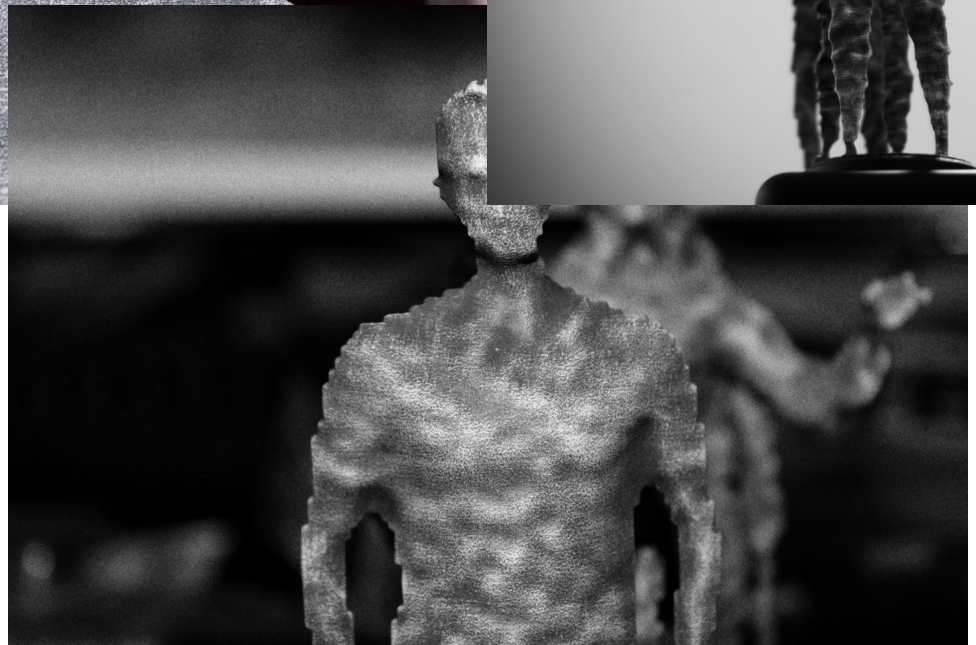
Posture Portrait Project (PPP):

The Process









Visualizing the Breath: The Process

Visualizing the Breath Timeline

1

Development + Goal Setting

Professor Boggia presented her original idea and we developed it collaboratively.

Visualizing the Breath Timeline

1

Goal Setting + Planning

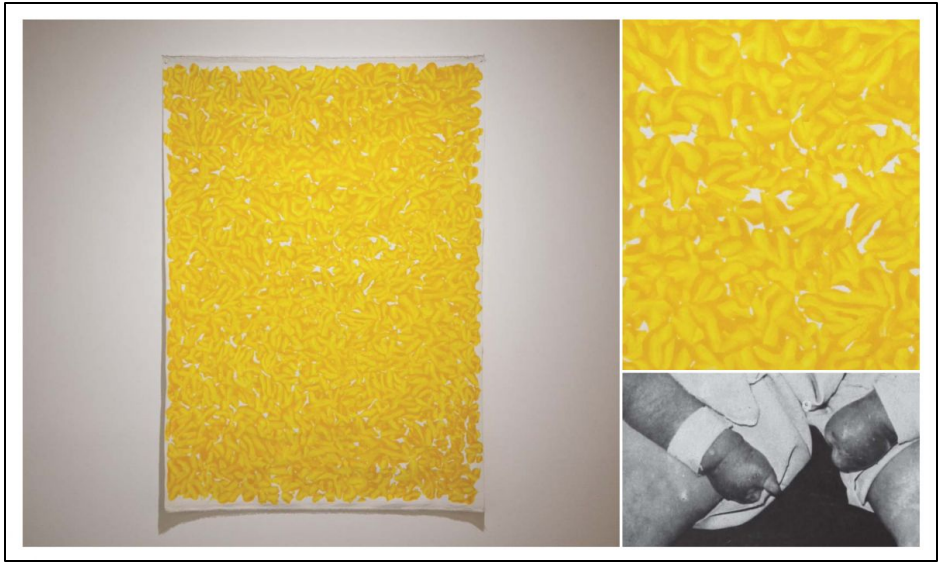
Professor Boggia presented her original idea and we developed it collaboratively.

2

Research artworks and breathing sensors

We developed a list of artworks about the breath and did a literature review of breath tracking research

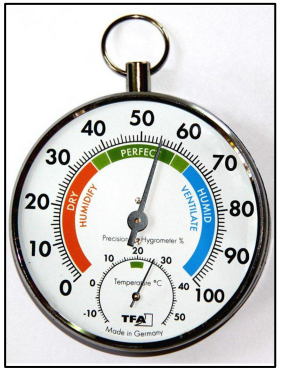
“Prima Ballerina Míra Holzbachová Dancing on the Roof during the Spanish Civil War”, Valencia (detail), 1937



“You Can Continue to Breathe at the Ending Point of My Breath”, Sun Choi (2015)

“Breath with me, ” Jeppe Hein’s (2019-ongoing)

Tracks only exhale/inhale



Humidity sensor/hygrometer (generic)

Small wind turbine (generic)

Thermal camera (generic)

Heart rate monitor(generic)

Tracks both

Breath tracker (Spire Stone)

Baby Sleep Tracker (Sense-U)

Clip-on microphone (generic)

Breathing Strap (neuropeak pro)

Conclusion: Strap or Build

What we need

- Tracks inhalation and exhalation
- Live output
- Reasonable budget
- Easy to use and extract live data
- Reasonable shortcomings

Two choices:

- Buy the Neuropeak Pro (not cheap)
- Build it ourselves

Visualizing the Breath Timeline

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Goal Setting + Planning

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Research artworks and breath sensors

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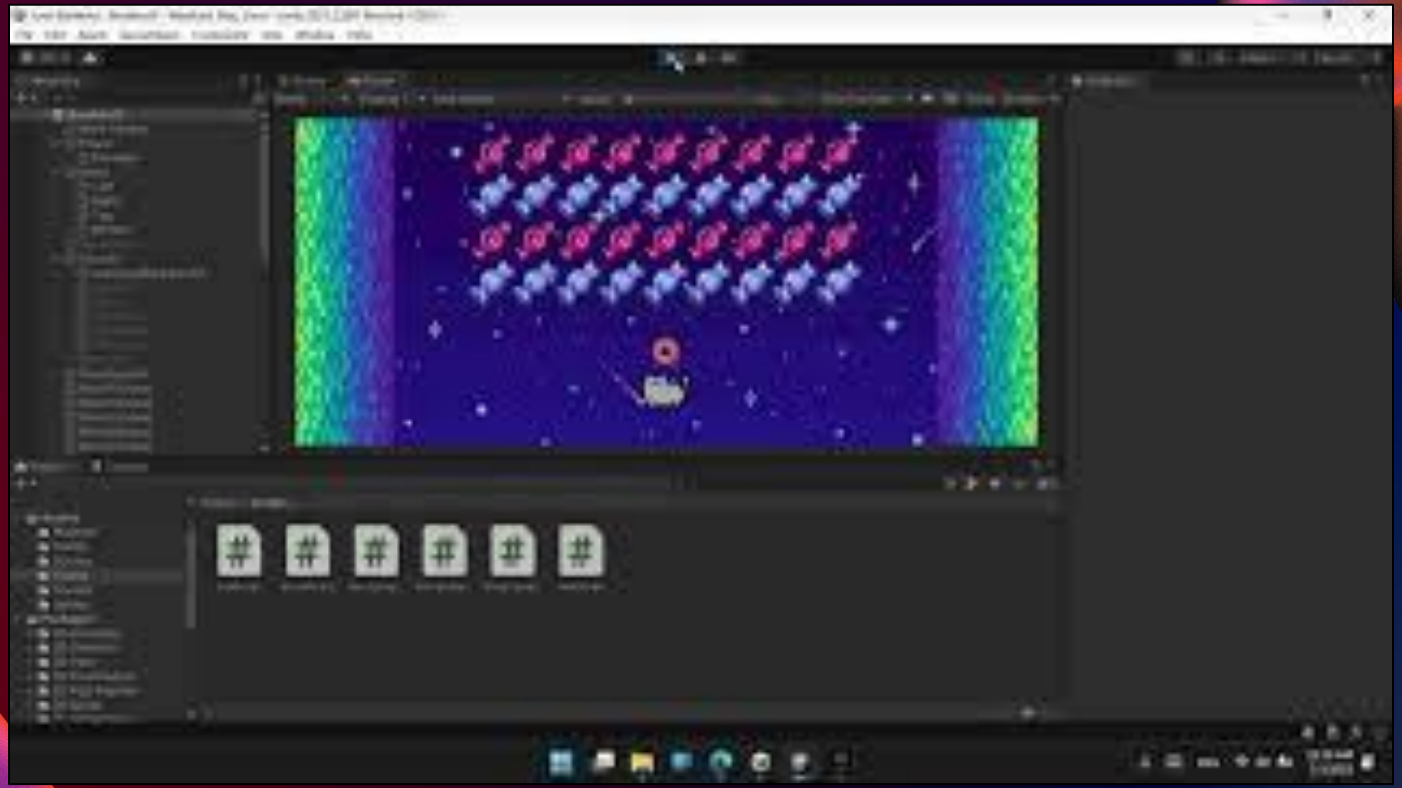
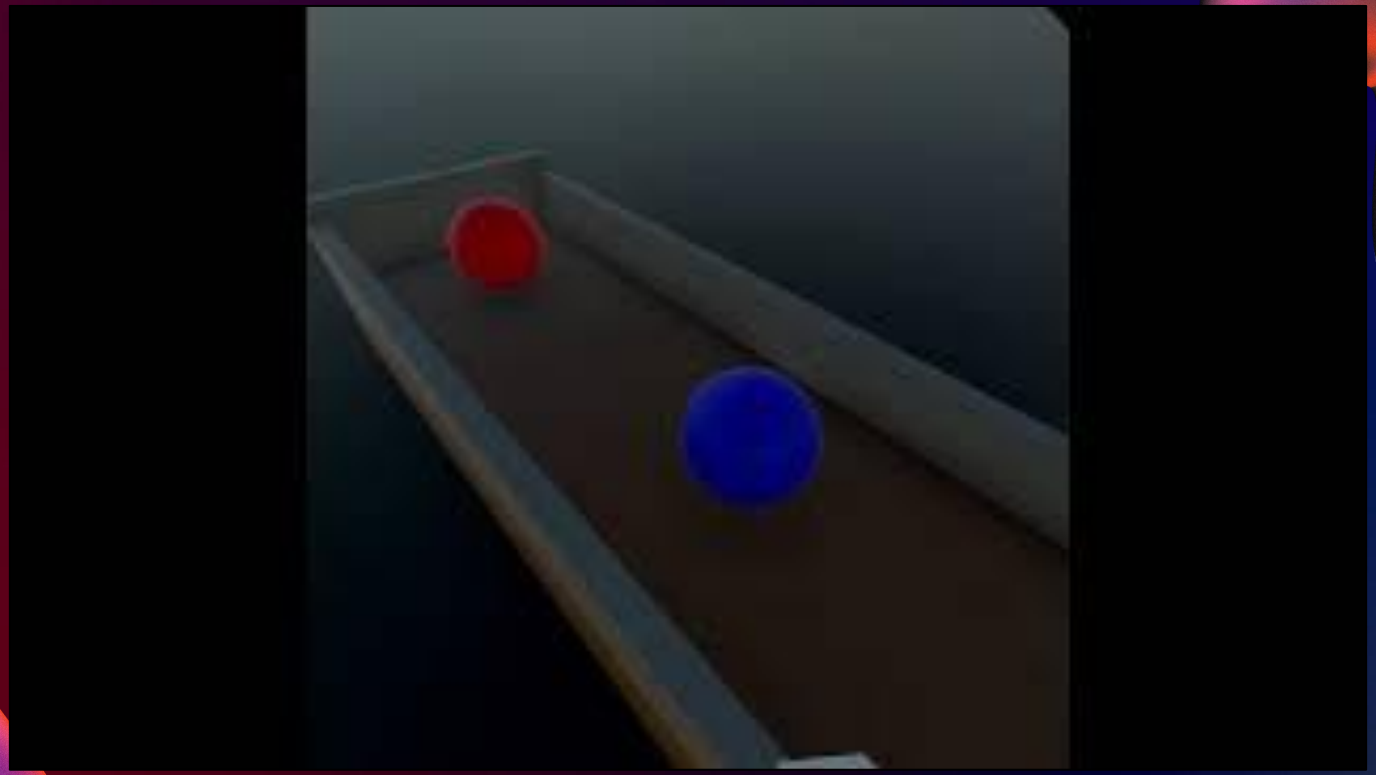
3

Learning the software

Before starting to prototype, we learned to use Unity and Unreal Engine





Visualizing the Breath Timeline

4

Visualizing + Building the prototype

Created different prototypes to test and visualize our idea through a 3D environment and in Virtual Reality

Particle System on controllers

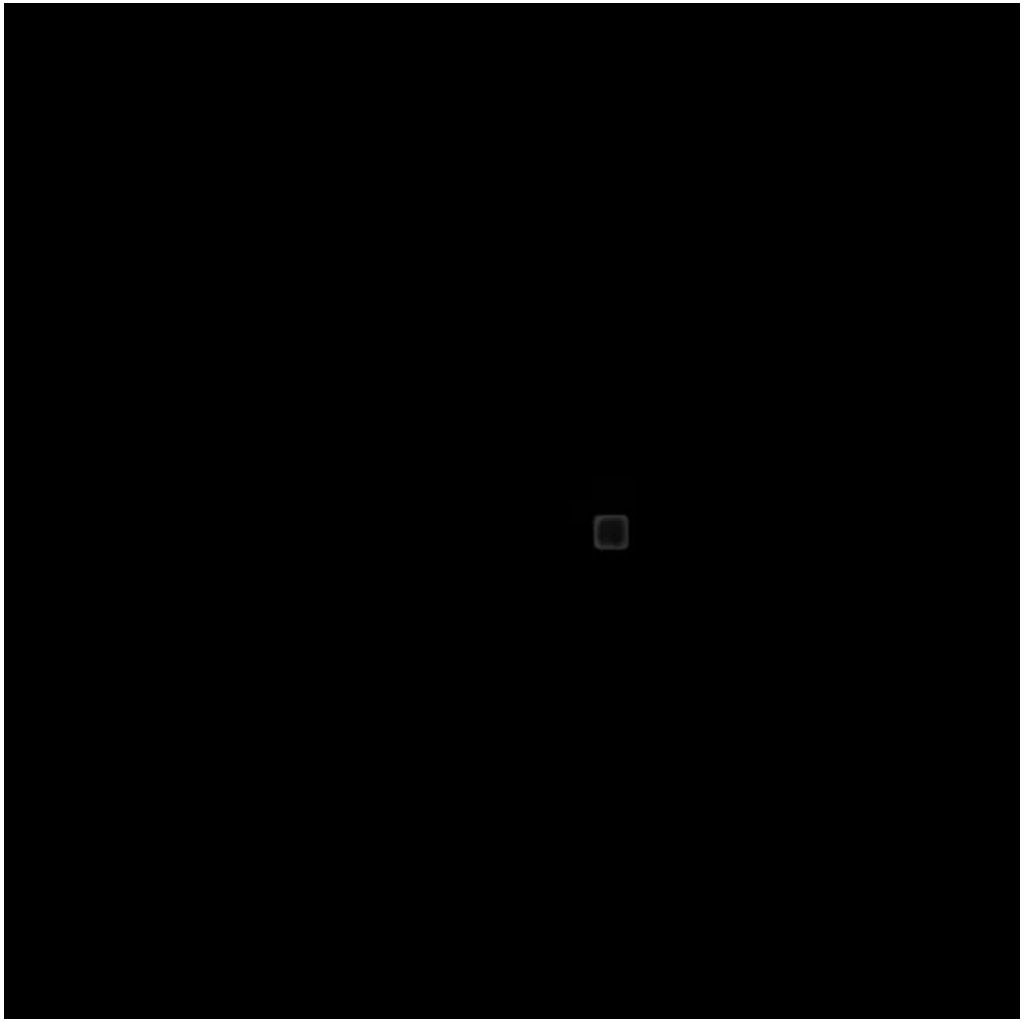
Post processing + Particle System on the Headset

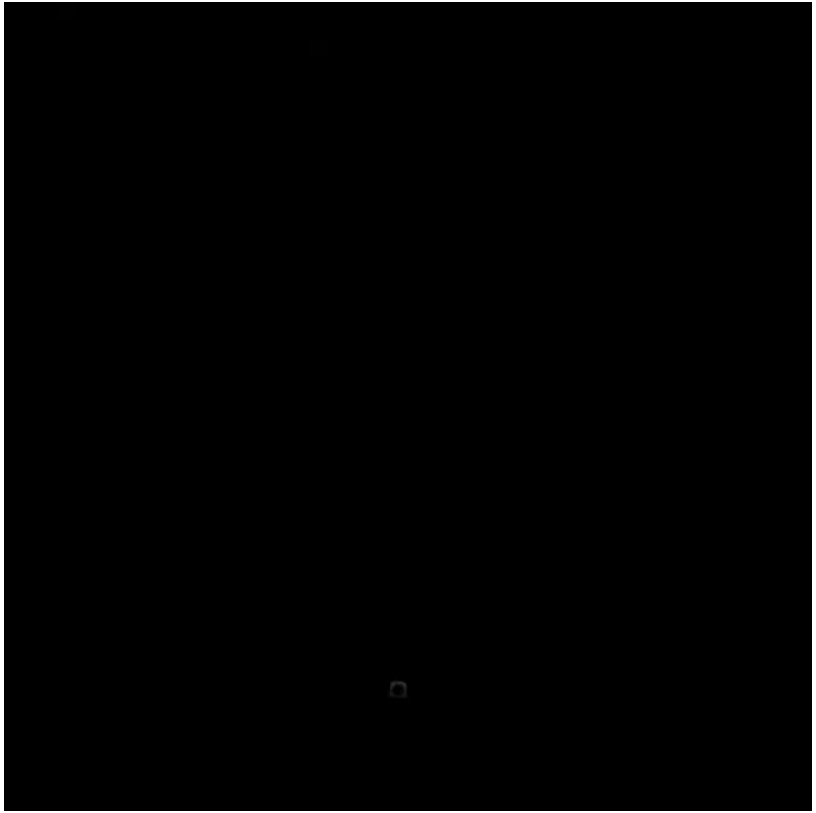
Added environment decorations + sounds and music

Keyboard controls + Refinement of Particles

Microphone input to control exhaling

Implemented Forcefield + Threshold values on mic





Visualizing the Breath Timeline

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Visualizing + Building the Prototype

Created different prototypes to test and visualize our idea through a 3D environment and in Virtual Reality

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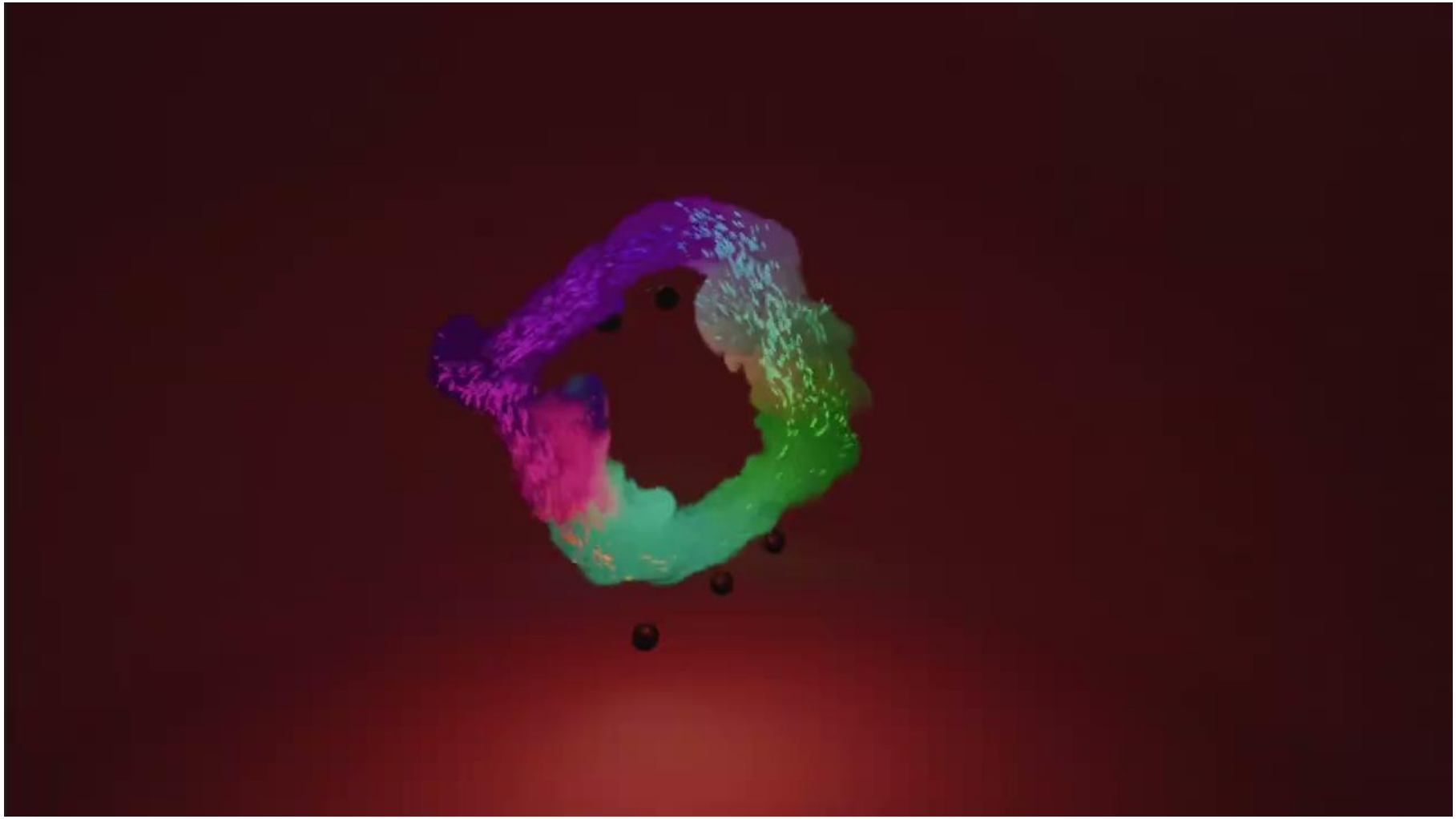
Complicating/Improving the Prototype

Creating a more complex Prototype, able to render more amount of particles

Different particle systems + performance

Latest Unity Shuriken PS Prototype



Jun's Next Steps

(before July 14th)

1. **Create a particle system using Unity VFX graph**
   Unity Shuriken Particle System VS Unity VFX Graphs

2. **Finalize and optimize the Prototype**
   Implementing basic VR controls, and creating two separate prototype: demanding vs efficient

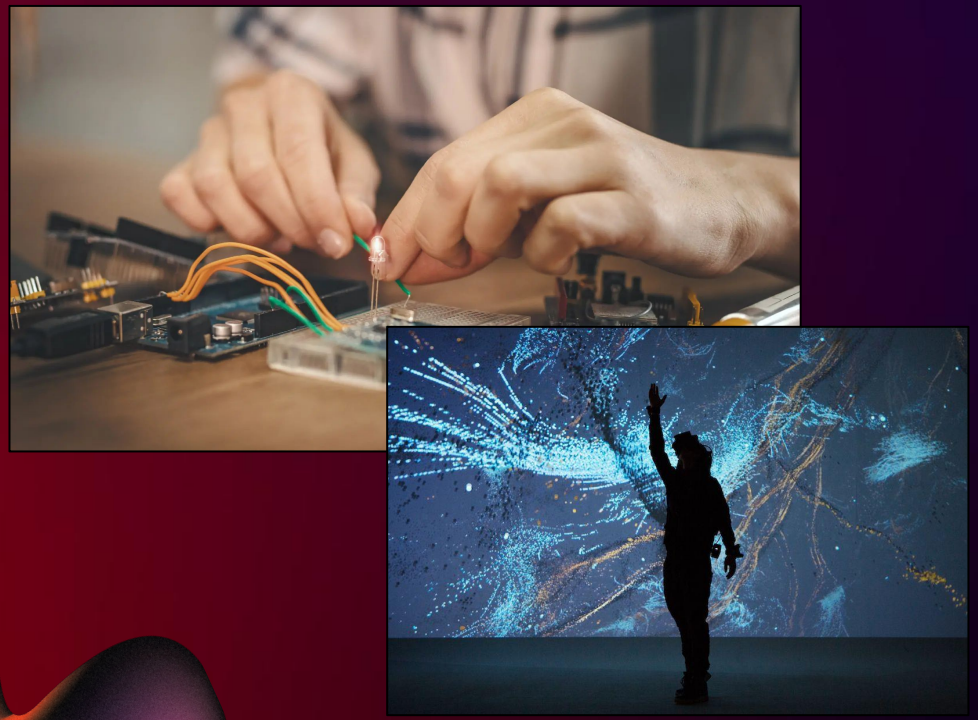
3. **Write SSRI Summary and Paper**
   Finish up writing a summary and paper for SSRI

Bazeed's Next Steps

(before July 14th)

1. VR Ready
2. Sound Reactive
3. Optimized Performance

In the Future... (post SSRI)



1. **Building the breath tracking device**
   Using the variable resistance stretch fabric to calculate threshold for inhale/exhale

2. **Optimize software for the hardware**
   Depending on the CPU used to run the installation different program settings are required

3. **Hosting the Installation**
   YAYYY!

Any questions?

THANK
YOU
luisricardo