UW Reality Labs

Sponsorship Package

*UW Reality Labs is a **XR & Spatial Computing Design Team** at the University of Waterloo*

Who we are

UW Reality Labs at the University of Waterloo specializes in **XR and spatial computing.**

We are the **first design team in Canada** that offers students hands-on experience with consumer VR (virtual reality) and AR (augmented reality) technologies.

Our focus spans a broad range of areas, including optics, mechanical design, software development, firmware, and machine learning applications.
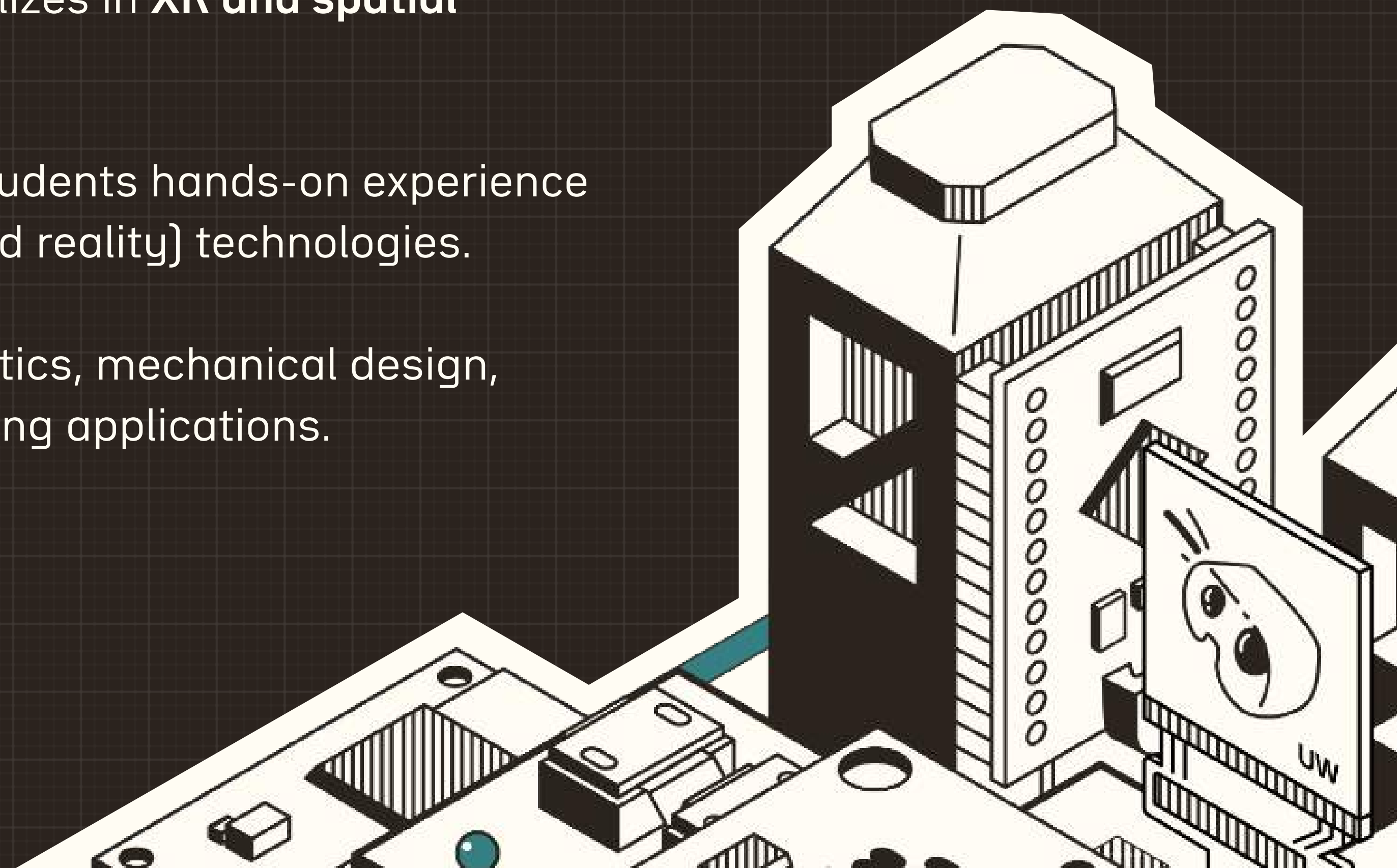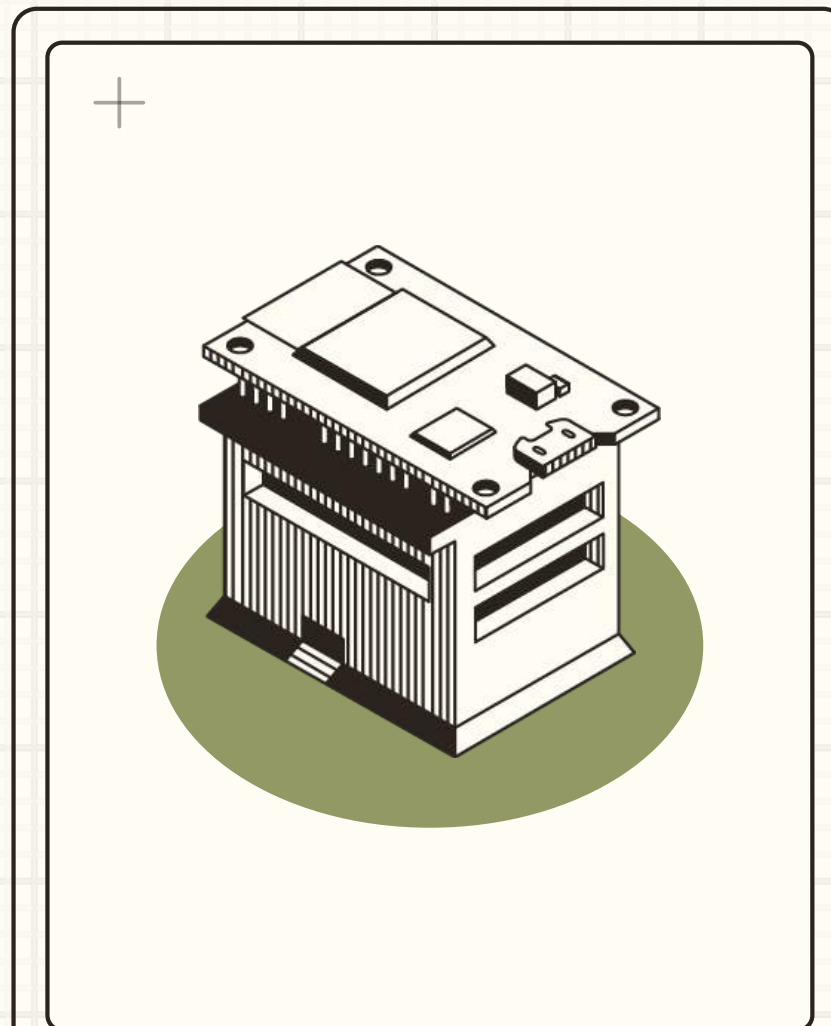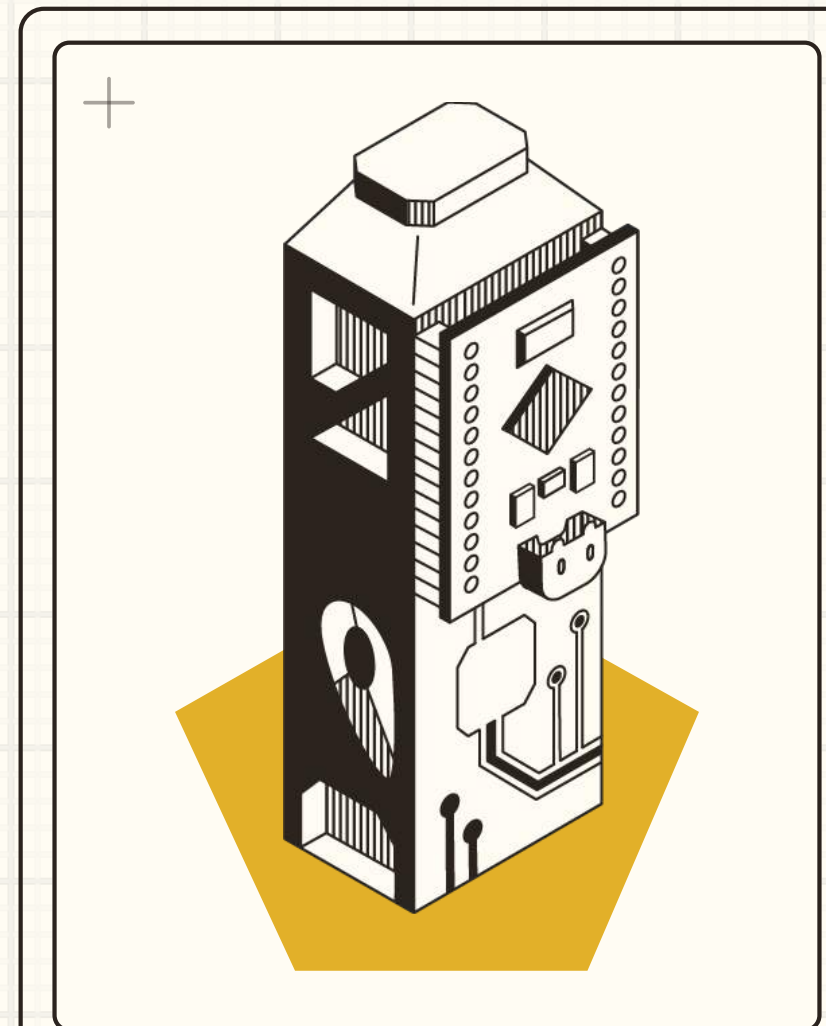
Current Projects
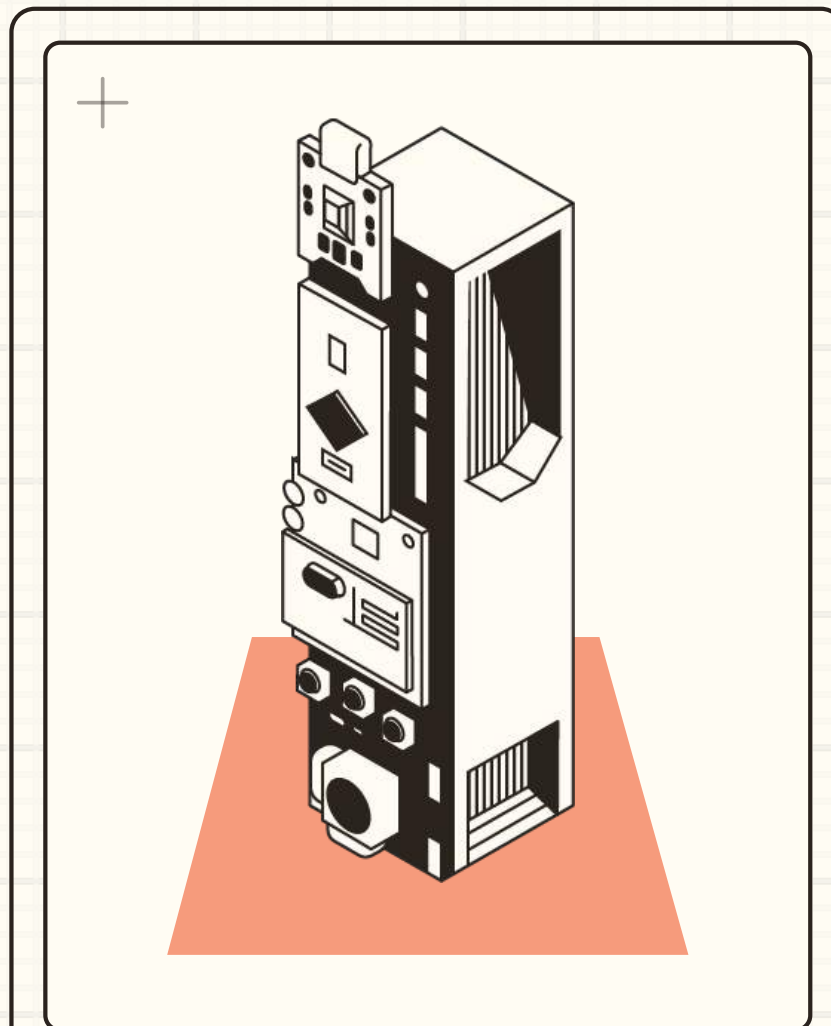
Reality From Scratch

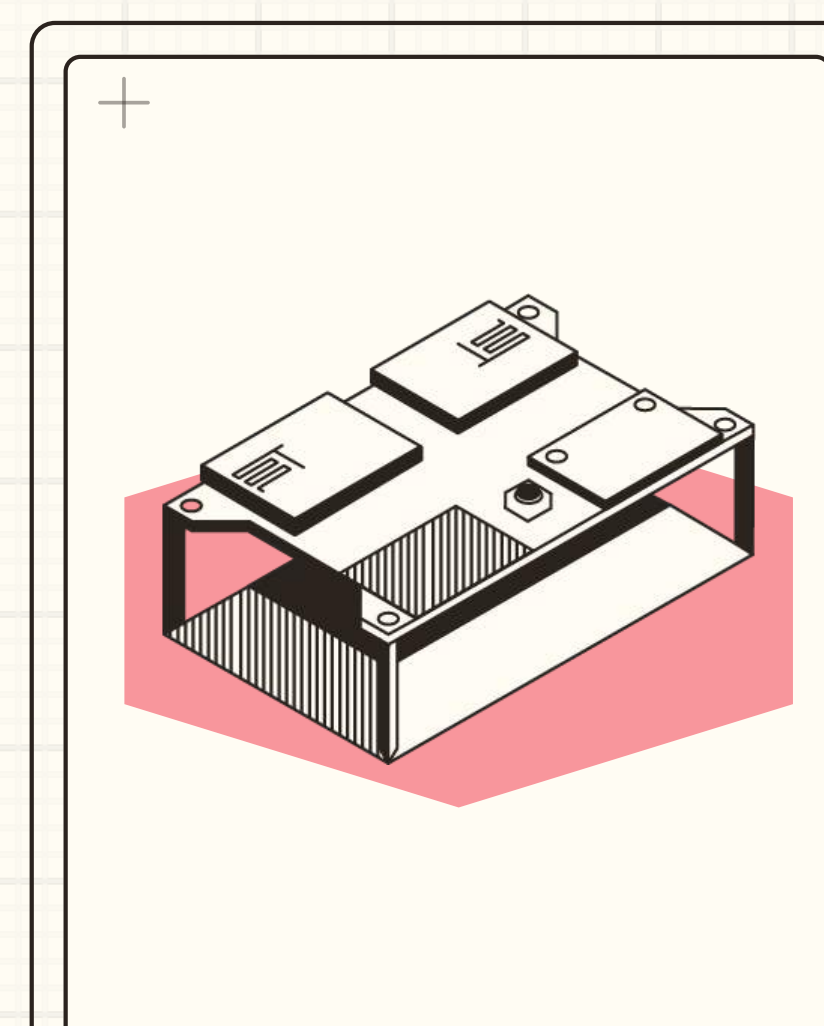Building a custom **VR headset** from scratch

Northstar

Building a working **AR headset** from scratch

Universal Gestures

Using deep learning to understand hand-tracked movements

DeepFocus (Redux)

Creating natural, eye-like defocus blur in real-time game engines for VR

Varifocal

Bringing adjustable focus to VR headsets.

View on GitHub

Reality From Scratch

By using an IMU connected to an Arduino Pro Micro, we achieved **rotational (3DoF) tracking.** The IMU motion vector data is translated into SteamVR readable input through drivers forked from the OpenVR SDK.
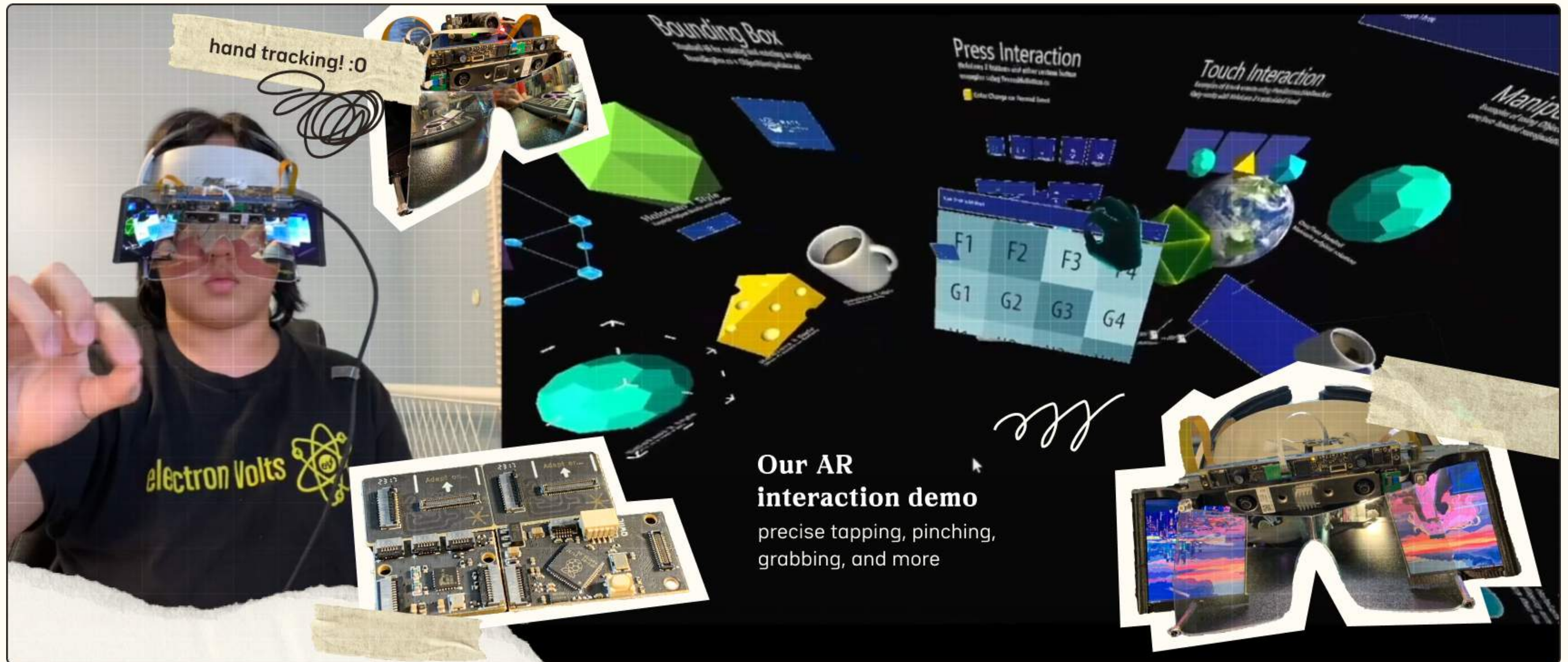
View Github

Prototype I

a simple 3DoF headset built with cardboard, tape, and Styrofoam

soldering done!

Project Northstar

A fully self-contained **AR device** using optical combiners and Intel's RealSense T265. Based on Ultraleap's Project North Star.

Watch Demo ▷

Universal Gestures

Using deep learning to understand hand-tracked movements.

Watch Demo ▷

Varifocal

Traditional VR display systems are limited to a fixed virtual image distance. We achieve dynamic distances by moving the displays closer and further from the lens via stepper motors. To quickly and accurately approximate where in the virtual scene the user is looking (and therein finding the virtual object's distance from the user), we implement real-time eye-tracking with EyeTrackVR and OmniVision cameras connected to an ESP32S3.

Varifocal Research

a snippet from one of our member's research on the vergence-accomodation conflict
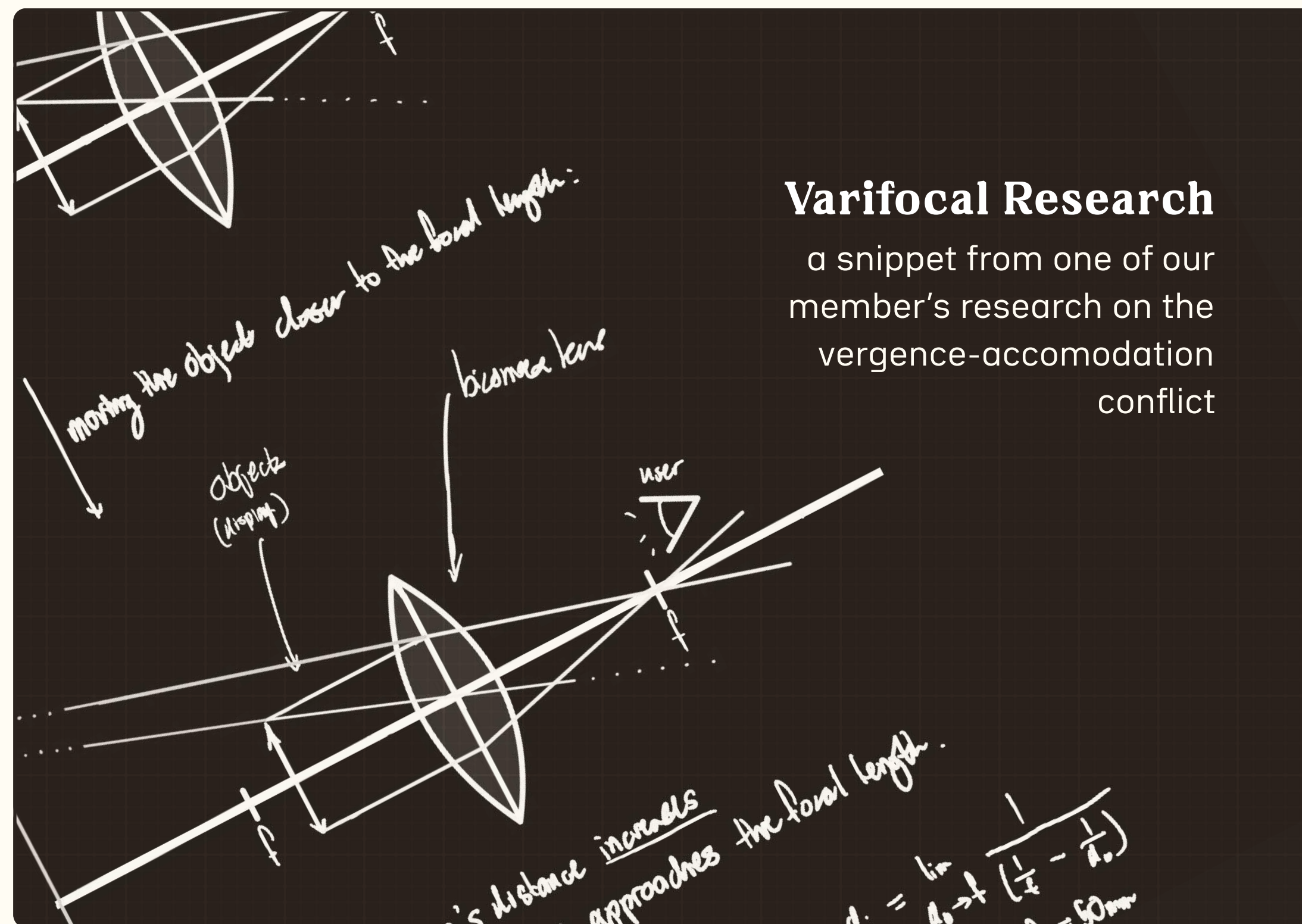
Deep Focus (Redux)

The goal of DeepFocus, originally developed by Meta (formerly Facebook) Reality Labs, is to create a **convolutional neural network** capable of adding natural blur to frames generated by a game engine in real time. This blur mimics the focal properties of the human eye when focused, achieving this effect with minimal performance penalty compared to traditional photorealistic (eye-realistic) blurring methods.

Abstract art generator

a scene made in Blender with randomized assets.
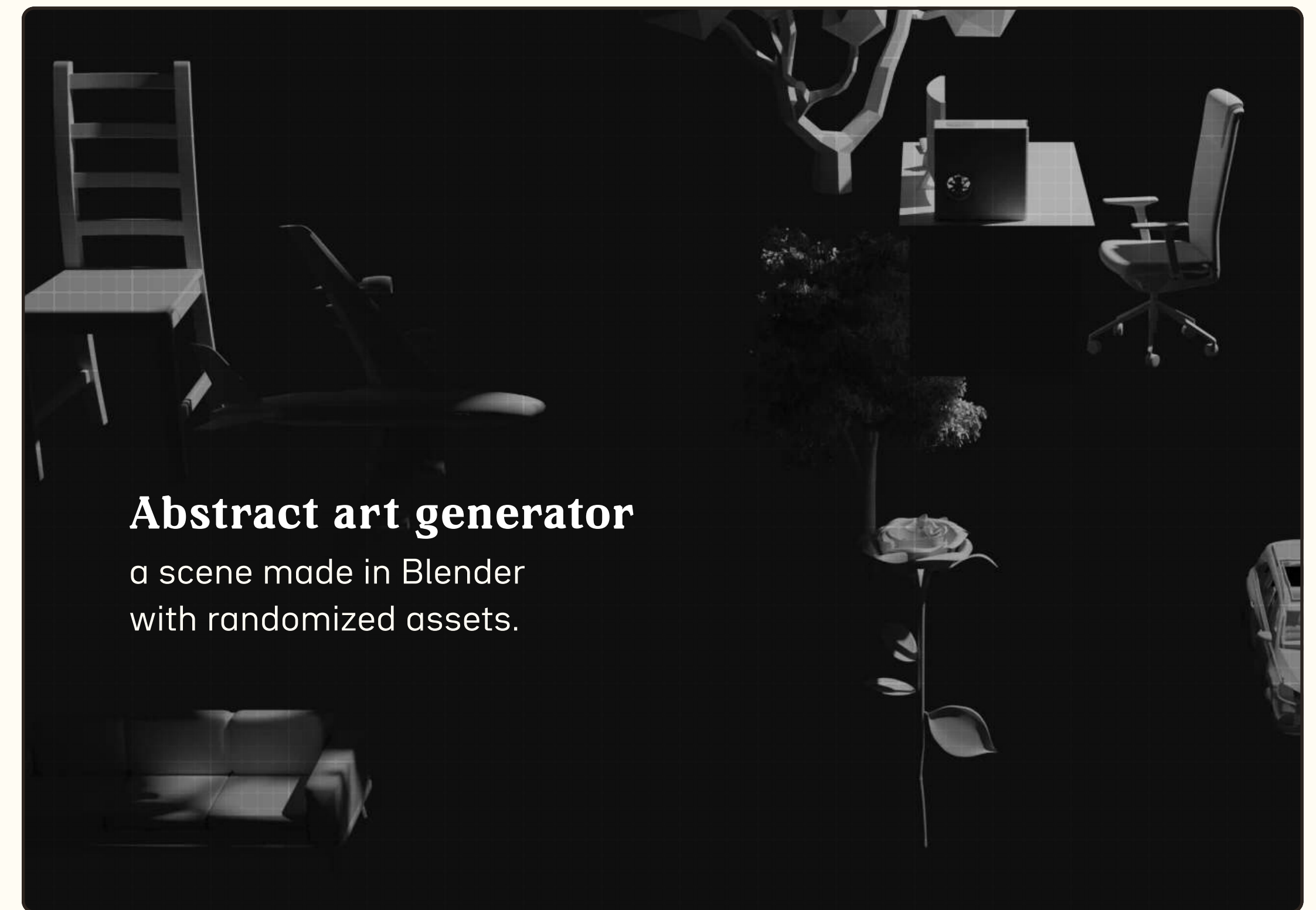
Demo'ed to
700+ participants at the
Socratica Symposium

Super Stage ▪

Slideshows have gotten stale over the last few years for both the the presenter and the audience. So we asked the question: How do we make presentations fun to watch again? The answer we found was Super Stage- an interactive, gesture controlled VR experience that emulates the feeling of a keynote presentation.

How your support helps us ◆

General Support

Alongside funding our projects, your support help us keep the team operating smoothly. This covers things such as:

- Team gear (T-shirts, stickers, shipping, and other essentials)
- Team venues (Event spaces for meetings, workshops, and booths)
- Marketing Costs (Digital and social media marketing)
- General Costs (web hosting, other misc costs)

Varifocal Display System

Funds allocated to the Varifocal project would allow us to purchase high-quality stepper motors, cameras, and ESP32S3 boards, as well as be able to afford multiple 3D prints for quick, iterative designs.

Universal Gestures

Having access to multiple Quest devices will allow us to introduce more students to developing XR experiences. The Quest 3 series in particular will allow for high-quality mixed reality (MR) development.

6DoF Visual-Inertial Tracking Module + Adapter boards

The budget for a visual-inertial odometry (VI-SLAM) module, powered by the Efinix Trion T20 FPGA, includes critical components like a OmniVision cameras and Raspberry Pi HQ cameras for image capture, which are essential for spatial tracking.

The T20 FPGA Dev Kit would be used to develop image processing tasks, such as convolution and corner detection. Funds will support us in creating a compact, efficient tracking solution to fill the void left by Intel's RealSense discontinuation.
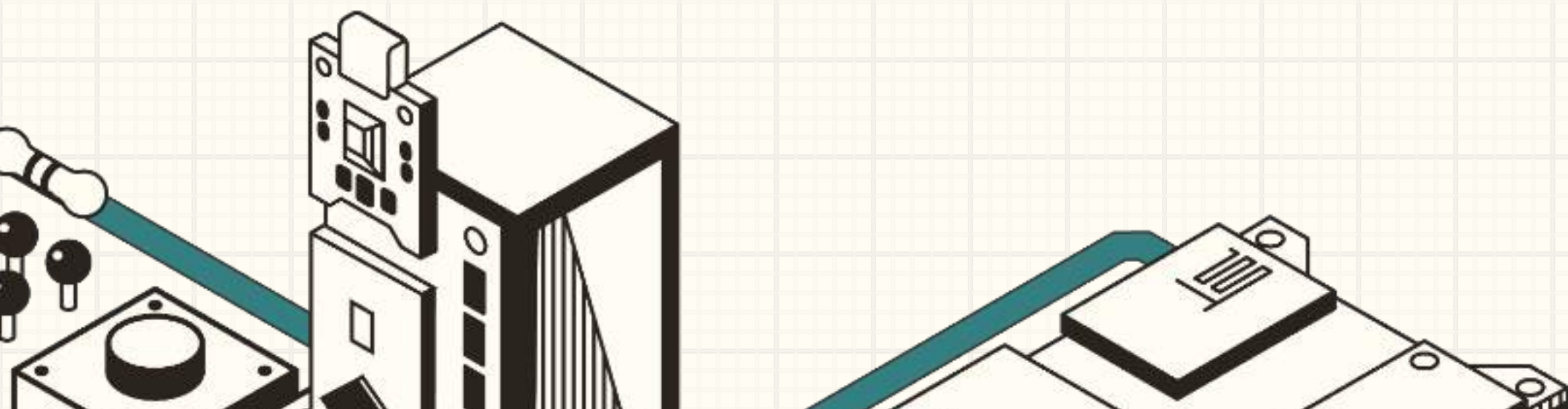
Sponsorship Tiers*
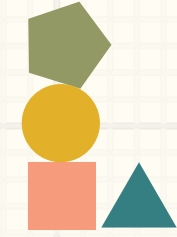
	Silver	Gold	Platinum
Company Logo on the design team t-shirt	X	X	X
Company Logo on design team website	X	X	X
Company promotion on Social Media	X	X	X
Company Logo in team presentations and videos during outreach events		X	X
Company shoutouts at events		X	X
Logo on project(s)**			X
Special collaboration requests			X
	$1,500	**$5,000**	**$8,000+**

*If you would like to sponsor us with hardware/ software, please reach out to us at **uwrealitylabs@gmail.com**
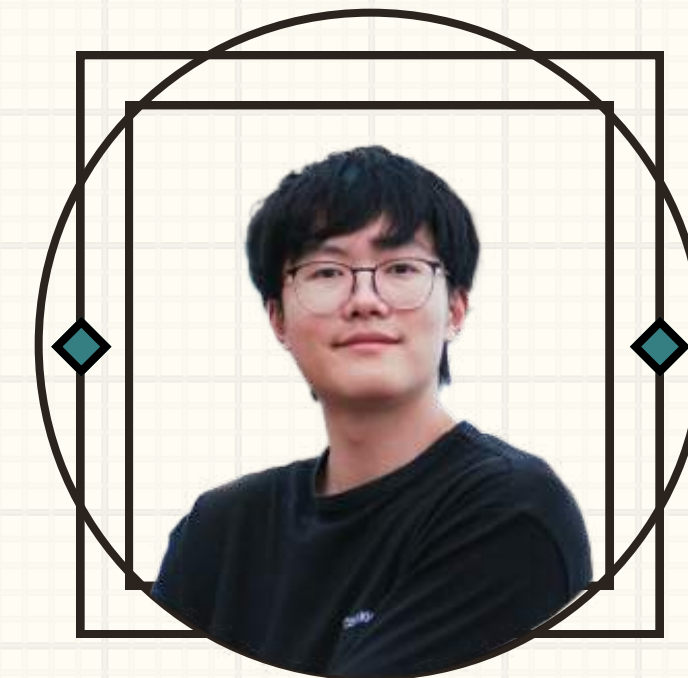**Your logo will be on the project(s) that your funding is put towards.
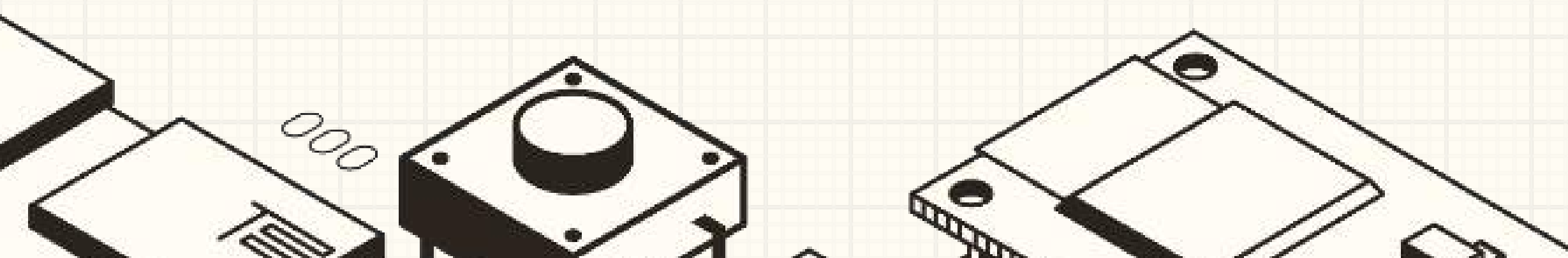
Team Leads
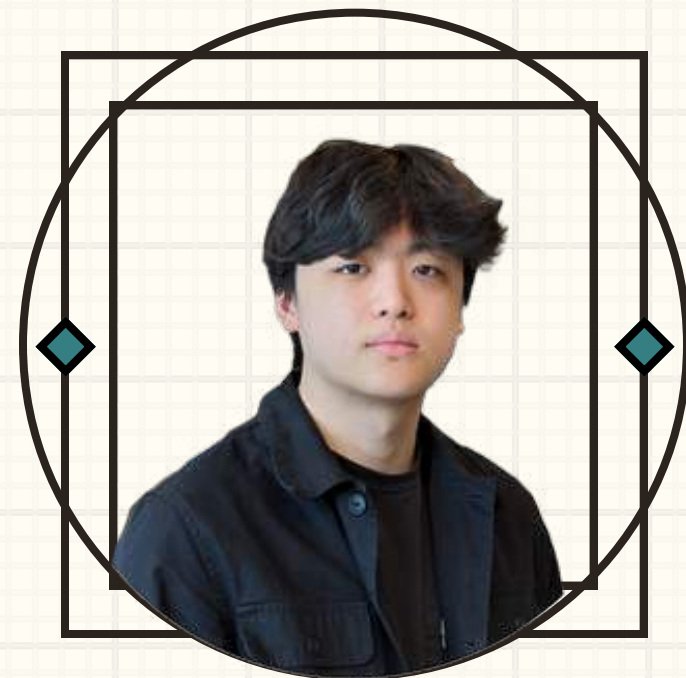
Kenny Na
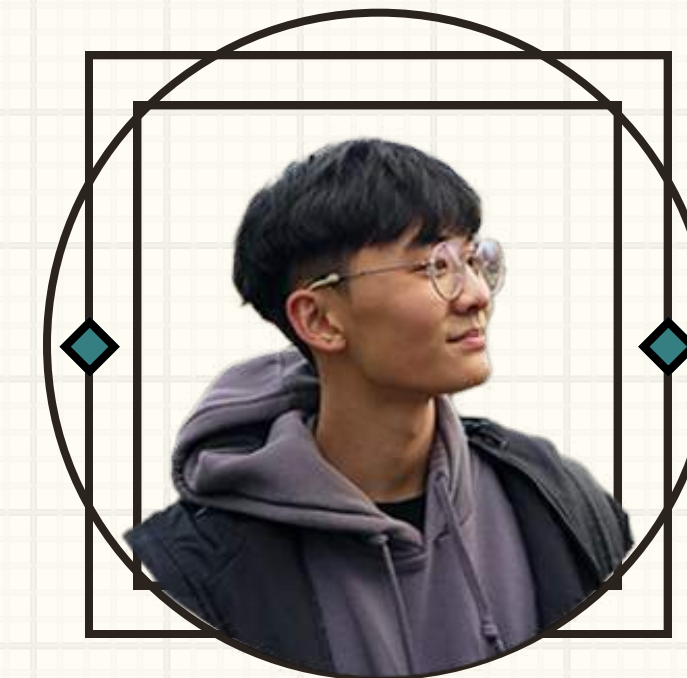*Hardware Lead*

kenny.na@uwaterloo.ca

Vincent Xie
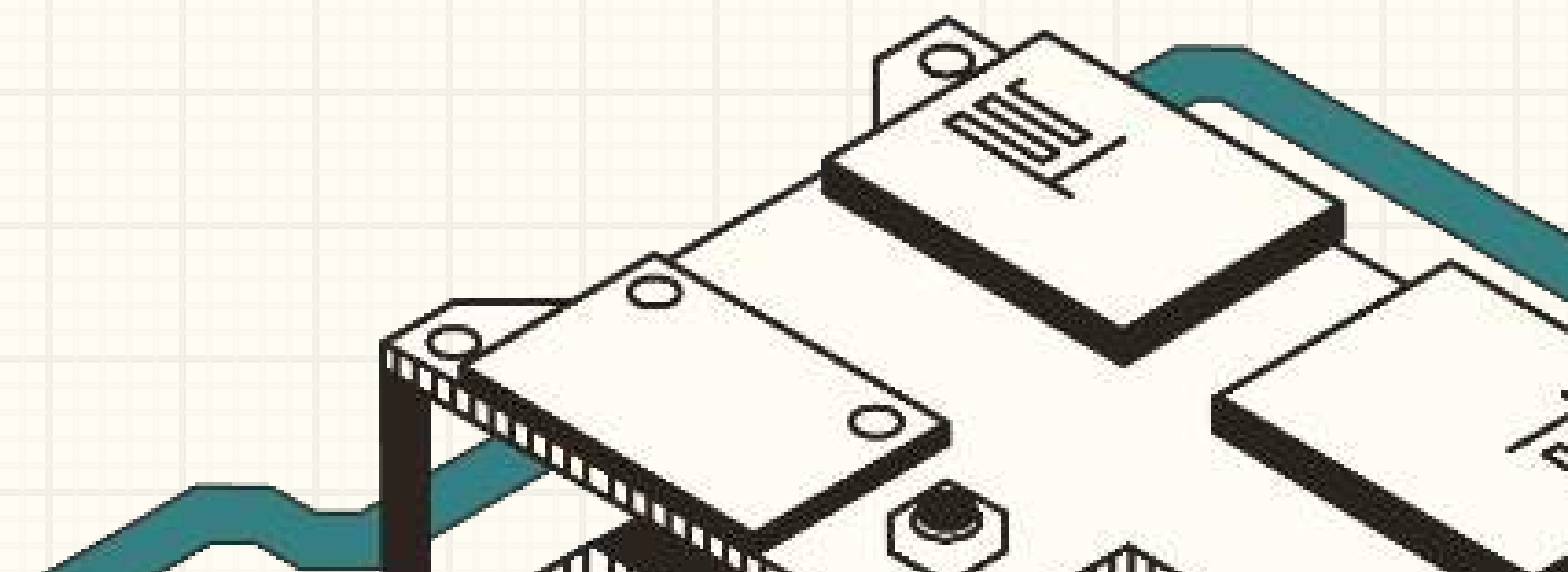*Software Lead - AR*

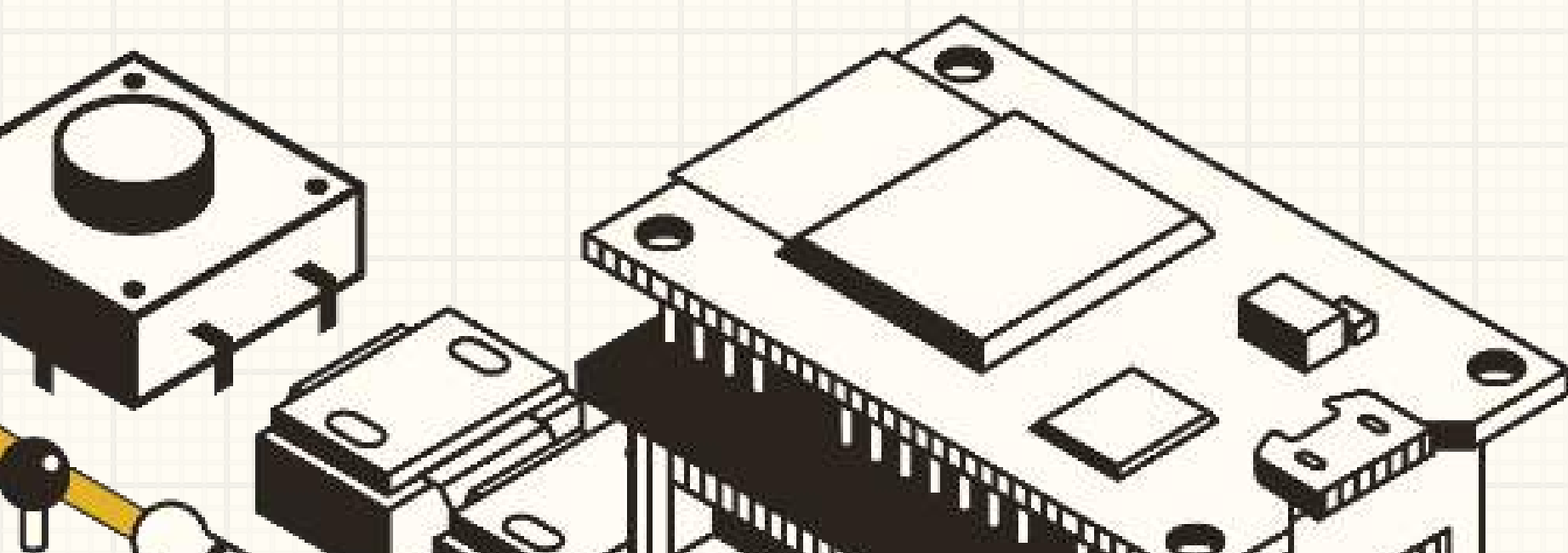vincent.xie@uwaterloo.ca

Justin Lin
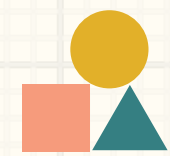*Software Lead - VR, ML*
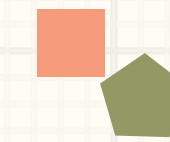
justin.lin1@uwaterloo.ca

Spark Mark
Branding Lead

spark.mark@uwaterloo.ca

Thank You!

The team at UW Reality Labs greatly appreciates your consideration.
We are excited build a brighter reality through the **exploration of creating human centered XR experiences**, and we hope you can join us on this journey.

LinkedIn │ Discord │ Github

uwrealitylabs@gmail.com