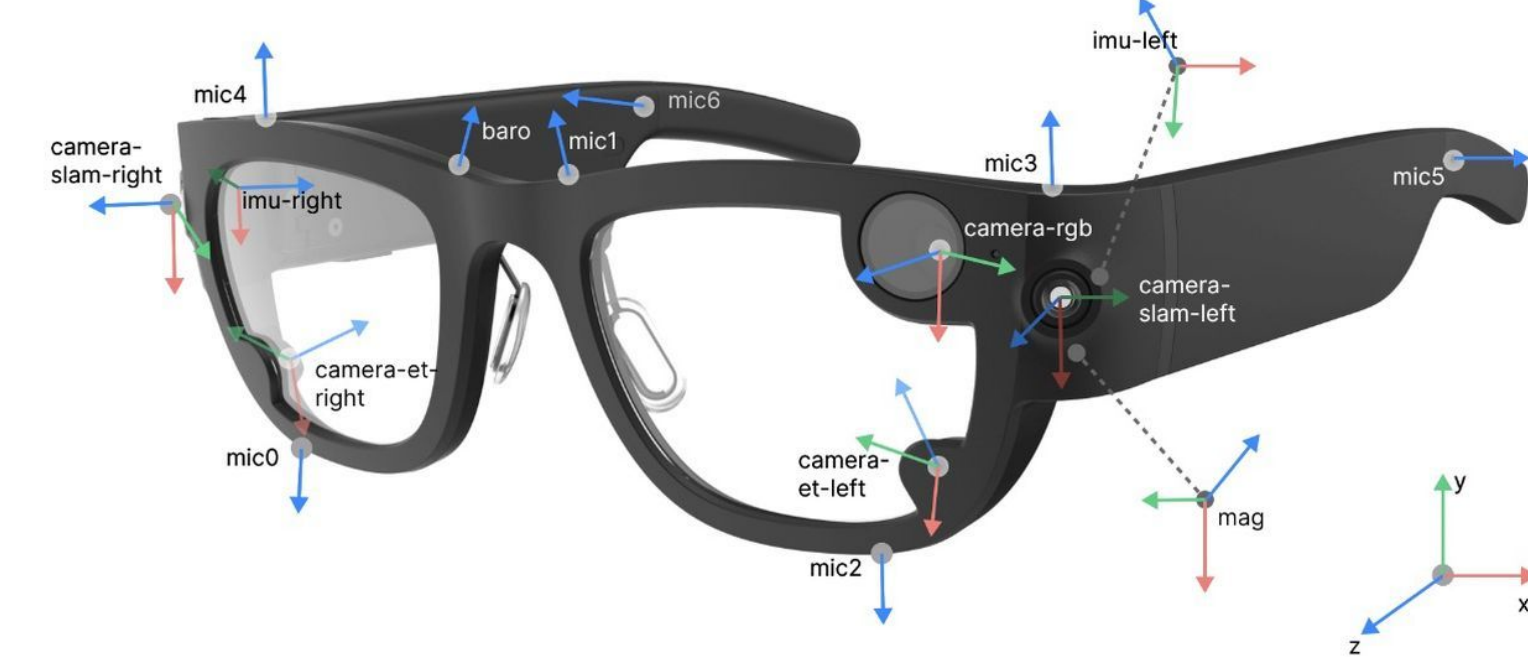
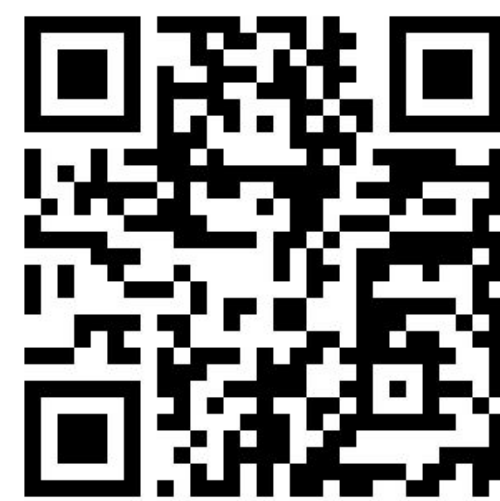




Introduction

Project Aria, developed by **Meta Reality Labs Research**, is a platform for advancing AI in areas like computer vision. Using its software development kit (**SDK**), data can be streamed from **eye-tracking** and **RGB sensors** to gain real-time insights into attention and behavior.

This was applied to tackle **focus issues**: people often **overuse** digital devices without breaks, causing **eye strain**, or get **distracted frequently**, hurting **productivity**.

Workflow

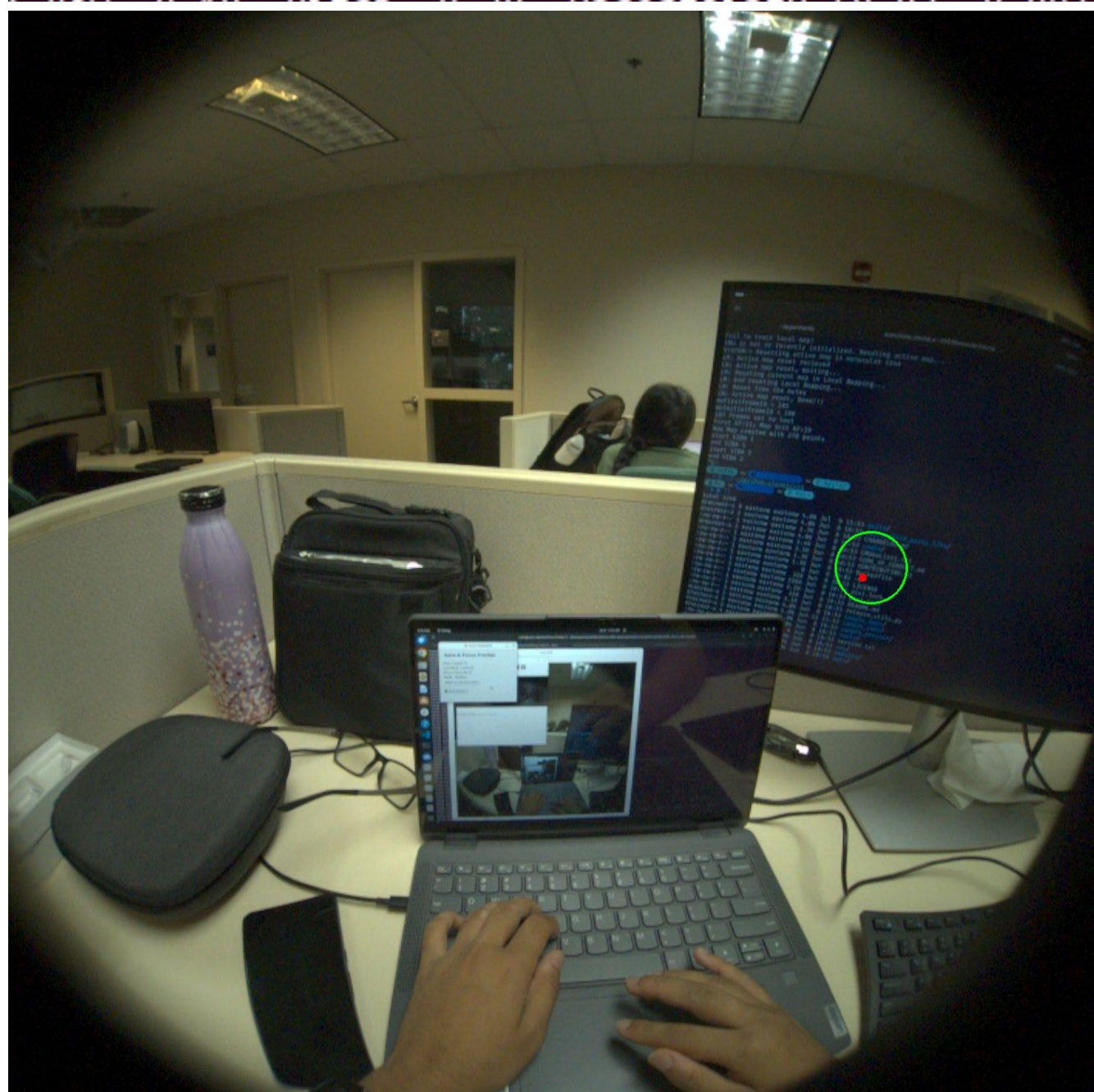
- Images sent from **glasses** to **Laptop** through **Wi-Fi**
- Frames sent to **ORBIT** server through **SSH tunneling**

- Aria Eye Tracking Model** returns eye gaze **yaw/pitch** prediction, **converted to pixel**

```

: Yaw=0.04, Pitch=-0.18, Uncertainty=(0.06, 0.11),
: Yaw=0.03, Pitch=-0.14, Uncertainty=(0.07, 0.12),
: Yaw=0.02, Pitch=-0.14, Uncertainty=(0.07, 0.12),
: Yaw=0.16, Pitch=-0.26, Uncertainty=(0.02, 0.03),
: Yaw=0.16, Pitch=-0.32, Uncertainty=(0.02, 0.03),
: Yaw=0.06, Pitch=-0.25, Uncertainty=(0.03, 0.06),
: Yaw=0.06, Pitch=-0.26, Uncertainty=(0.03, 0.05),
: Yaw=0.06, Pitch=-0.27, Uncertainty=(0.03, 0.06),
: Yaw=0.05, Pitch=-0.30, Uncertainty=(0.03, 0.05),
: Yaw=0.05, Pitch=-0.33, Uncertainty=(0.02, 0.04),
: Yaw=0.05, Pitch=-0.35, Uncertainty=(0.03, 0.05),
: Yaw=0.06, Pitch=-0.38, Uncertainty=(0.03, 0.07),
: Yaw=-0.11, Pitch=-0.33, Uncertainty=(0.04, 0.08)

```



- YOLO model returns **bounding boxes**
 - Object identified based on **which bounding box** the pixel is in
- Alerts displayed based on **objects being looked at** over a period of time

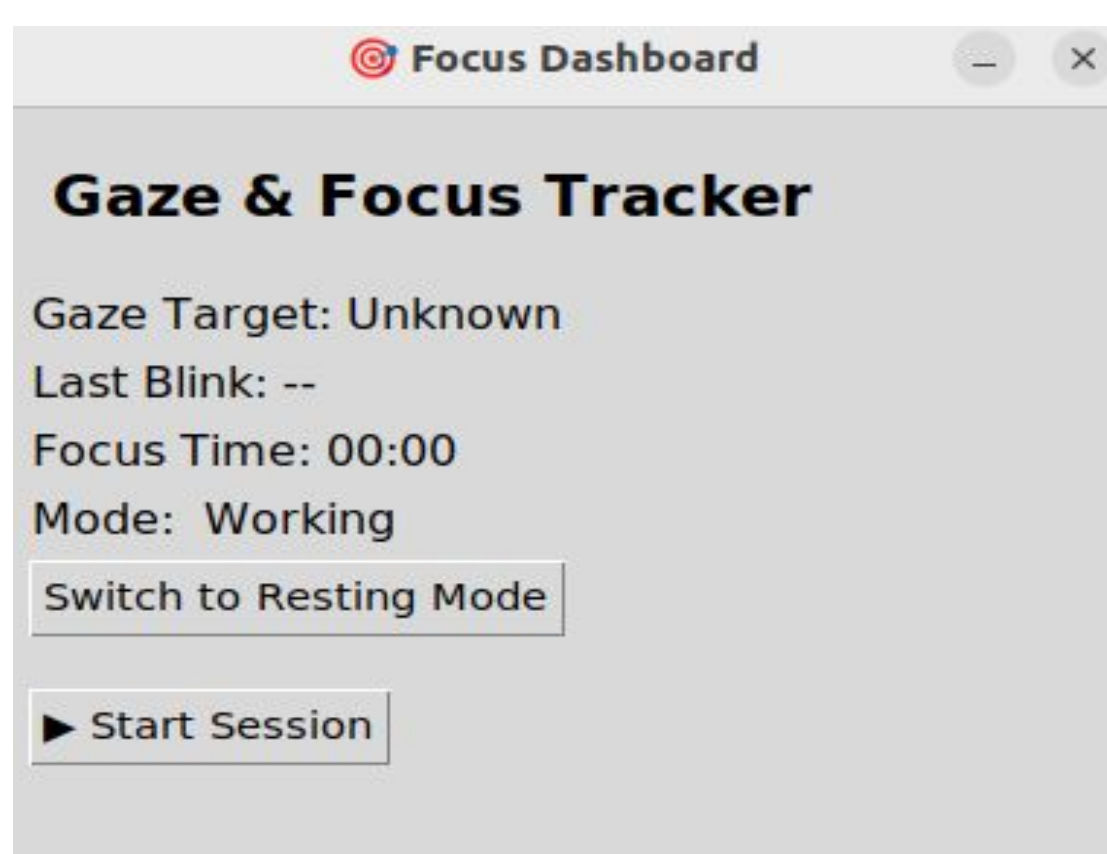


Testing and Validation

Gaze overlays (green circle, red dot) were saved to disk to **test accuracy**.

Object detections with **confidence scores** were logged to a **CSV file**.

Dashboard UX was refined through iterative testing, and **alert logic** was adjusted for **demonstration purposes**.



```

laptop,0.915
laptop,0.902
laptop,0.902
laptop,0.902
laptop,0.925
laptop,0.925
tv,0.813
tv,0.813
laptop,0.929
laptop,0.933

```

Acknowledgements

- Ivan Seskar** and **Jenny Shane** for managing the internship
- Professor Yao Liu** for her mentorship and guidance throughout the project
- Zihao Ding** for his support in the early stages of the project
- Meta** for use of their open source models and SDK

Objectives

- Create an efficient **visual perception** system using the Meta Project Aria Glasses.
- Develop a **smart study “assistant”** that can monitor eye behavior with the aim of **reducing strain, encouraging breaks, and detecting distractions**.
- Use local computer as an **edge** device and run all machine learning models on **ORBIT testbed**.
- Maintain a **reasonable accuracy** and as close to real time system as possible for **several minutes**.

Results

The system **accurately** detects when a user looks at a laptop for over **15 seconds** (or a **phone** for over **3 seconds**) and triggers alerts accordingly. In **resting mode**, alerts were correctly activated if the user **looked at the laptop** for more than **2 seconds**.

Object detection maintained an average of 93% confidence, 98% accuracy, an average latency of 9.5 ms per image, and an alert response time of 300 ms.

Future Work

- Use Meta Aria Gen 2 Glasses**
 - Increased battery use, more sensors, features such as microphone and speaker
- Advanced Applications**
 - Adaptive gaze-based UIs, posture correction alerts using IMU and SLAM data
- Dashboard Upgrades**
 - Personalized visual heatmaps, detailed post-session focus and strain analytics