

AUGMENTED DISPLAY AND MAPPING & ENHANCED VISION FOR EMERGENCIES (ADAM & EVE)



PROBLEM STATEMENT

Firefighters face low visibility in smoke and darkness, and current handheld thermal imagers slow down operations and increase risk.

PROPOSED SOLUTION

A compact, SCBA-integrated thermal Head-Up Display (HUD) for hands-free visibility, enabling faster heat detection and safer navigation.



THERMAL IMAGING: THE AXISFLYING 256

- Infrared camera captures objects in dark, smoke-filled environments
- High-quality imaging with object-depth capabilities



ADAM: PROJECTION DISPLAY

- Compact design with seamless, wireless connections
- Projects processed image onto helmet HUD for real-time visibility
- Provide information overlay hands-and-hassle-free



AI AND OBJECT DETECTION

- OpenCV with AI detection draws bounding boxes around identified objects
- Ability to distinguish between normal objects and potential fire sources
- Fast and smooth, with an **83%** accuracy rate

EVE: REFLECTIVE DISPLAY

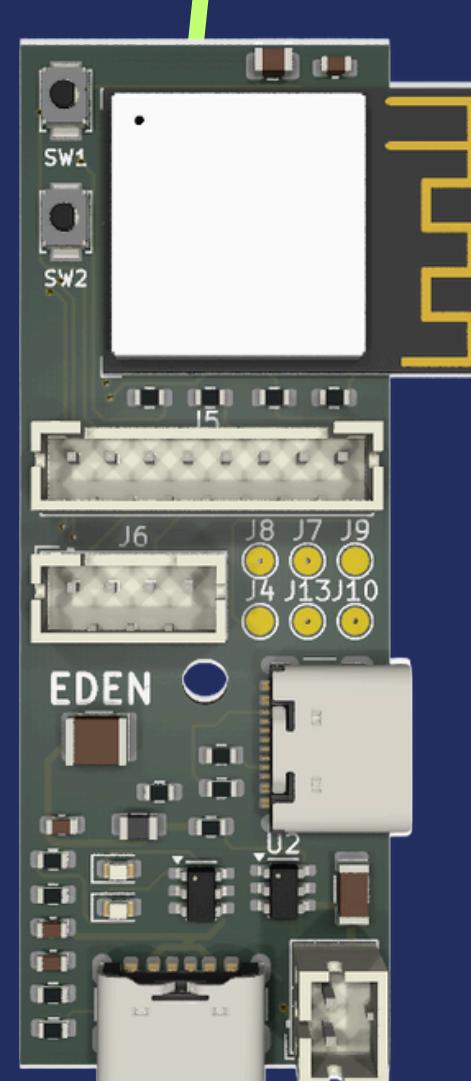
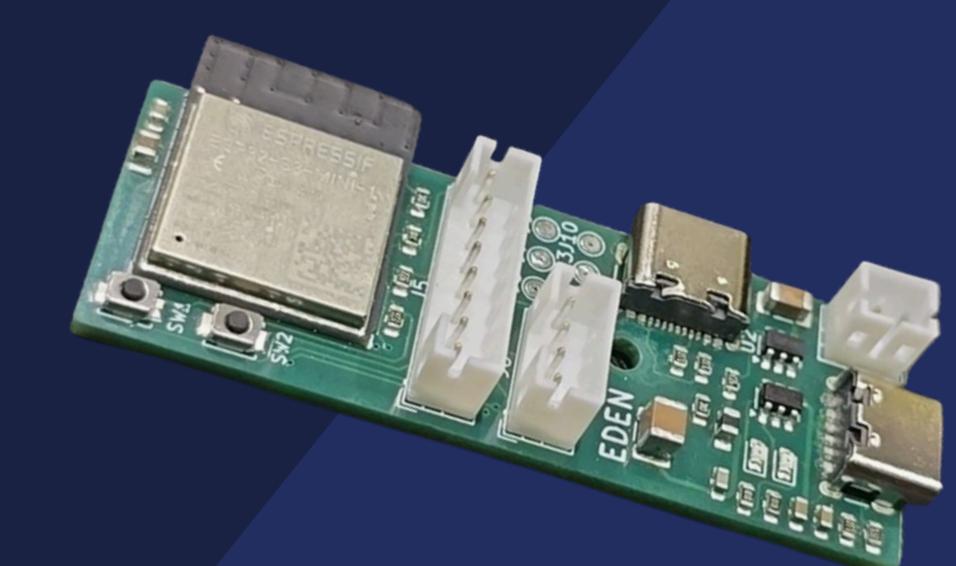
- LCD screen with 128×128 pixel density positioned at the nose bridge, hidden in the natural blind spot
- Utilises the helmet's natural curvature to slightly elongate the image, creating the effect of a larger display



MATERIAL CHOICE

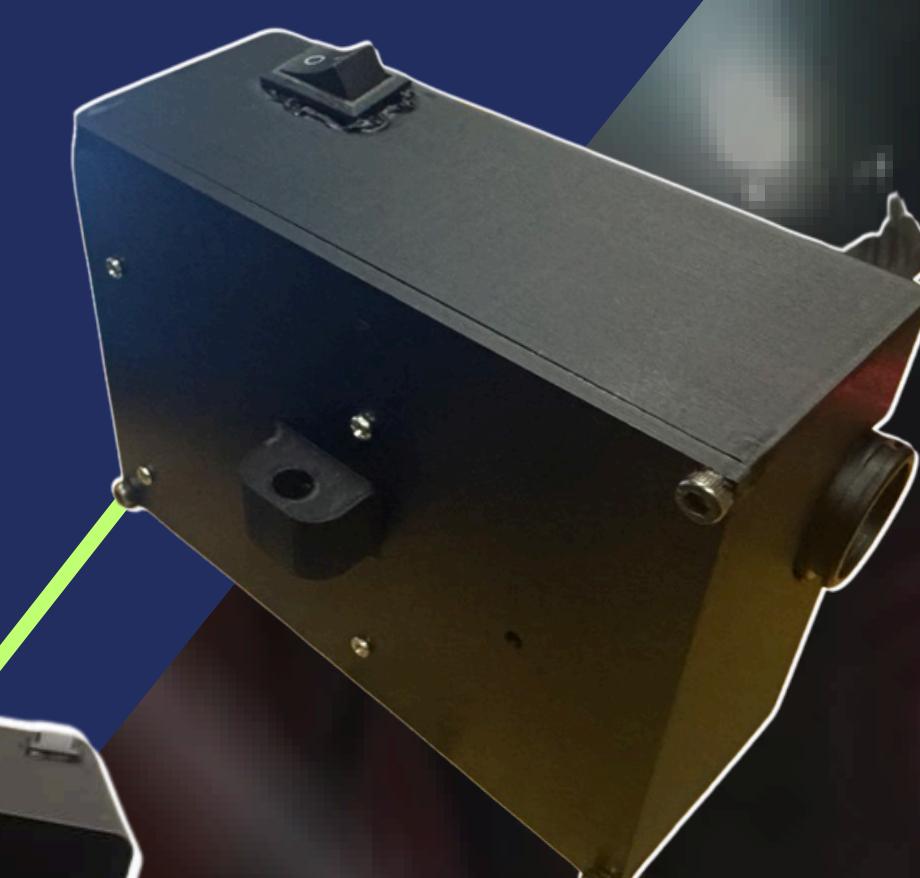
These materials are chosen based on their properties and ability to withstand heat

- Fibreglass structural piece
- Fire-retardant ABS housing



CUSTOM MICROCONTROLLER

- Custom-made PCB and microcontroller
- Capable of receiving and displaying thermal imaging information via Bluetooth
- Fast and small for minimum space wastage
- Charging module included



360° CAMERA MOUNT

- Adjustable camera mount for 360° thermal view
- Versatile yet sturdy
- Quick and easy customisation