ECE 6780 Project Proposal

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Description of application—I will be creating a real time interface between a miniature ESP32-CAM and a small, high pixel density OLED display. This display can then be mounted near a user's eye to create a Head Mounted Display (HMD) to facilitate real time user controlled image enhancement and processing. An eventual goal of this project is to incorporate infrared, thermal, and dual parallax cameras to extend the range of human vision. While implementation of this is beyond the scope of the project, eventual sensor expansions will be given consideration during design.

I. Block Diagram

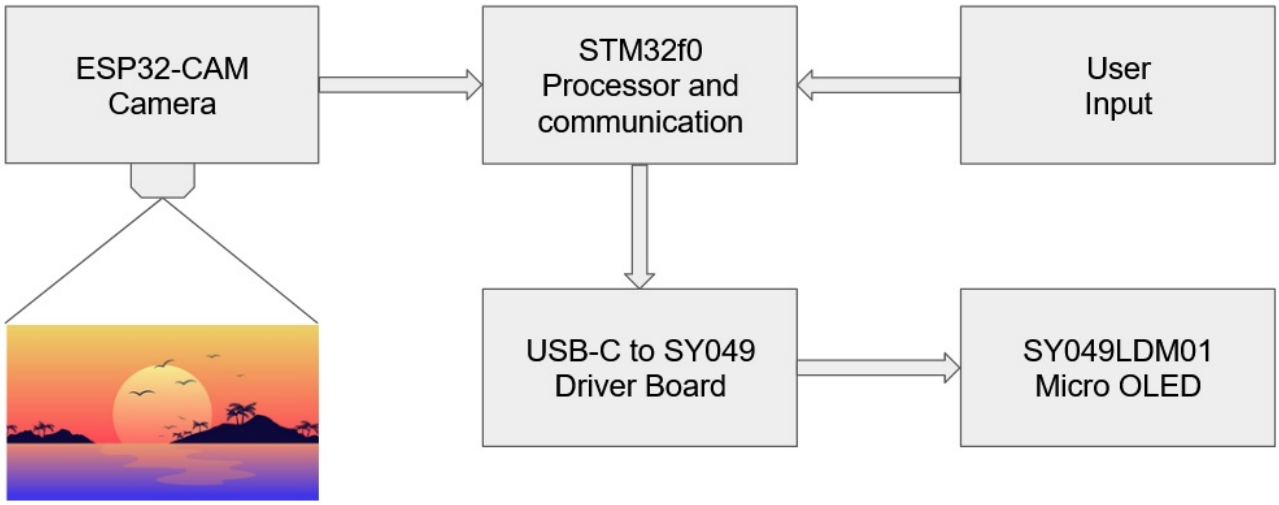

Fig. 1. A block diagram of the hardware to be used, including direction of information transfer.

II. Implementation Milestones

Milestone 1:

Communication between the ESP32-CAM and the micro-controller (assumed to be STM32f0 at this point). This includes taking images and transferring them to the STM32f0.

Milestone 2:

Manipulation of images stored within the STM32f0, including hue and saturation manipulation, as well as implementing CANNY edge detection.

Milestone 3:

Communication between the STM32f0 and the SY049LDM01, done through either an existing driver board or custom one. This communication includes displaying both static images and video smoothly.

Milestone 4:

Real time image capture, transfer, manipulation, and display from a camera to a HMD.