OmniView: The Future of Glasses

EECS 473 Senior Design Project

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Design Inspiration

Since the beginning of human interaction, people have struggled to remember names. For this reason, our group created a head worn device, capable remembering those names for you.

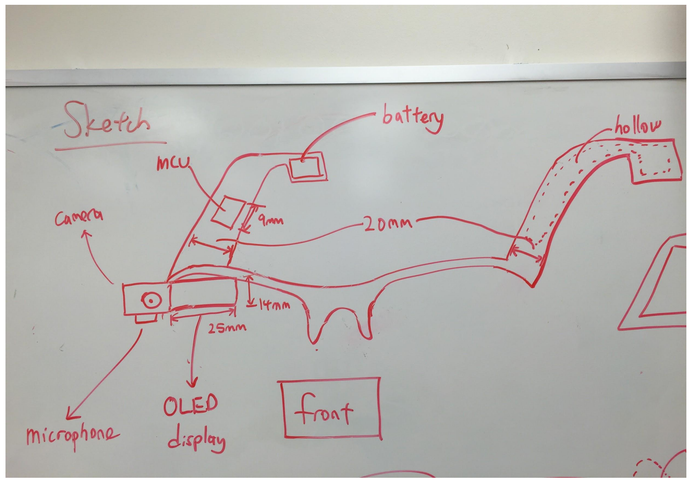

Figure 1: Original sketch of OmniView

Potential Market

We believe this product could see widespread casual use but is especially useful for people entering a large or new social environment. A prime example would be a teacher using OmniView to learn all the names of his students in a new college class.

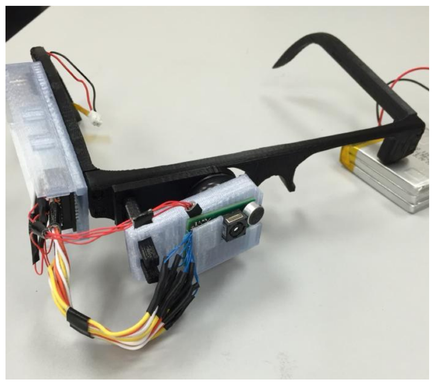

Figure 2: Finished Project

Implementation

Goals and Planning

Task	Start Date	Duration (days)	End Date
Decide on the microprocessor families and components models	Sept. 21	11	Oct. 02
Decide on reasonable face recognition libraries	21	11	02
Work on the final proposal and order development boards.	28	06	04
Order components	28	06	04
Wifi should at least be able to send/receive something (dev board)	Oct. 04	07	11
Board and schematic design	04	16	30
Implement OLED interface and user interface (dev board)	04	42	Nov. 15
Implement Face Recognition Algorithms (dev board)	04	42	15
Order PCB + shipping time	30	16	15
3D print the frame of the glasses	Nov. 15	02	17
Software development on face recognition feature with PCB	17	08	25
Fix remaining bugs on Wifi and OLED with PCB (if any)	17	08	25
Implement stretch goals if possible - Microphone	18	15	Dec. 03
Fix minor bugs, enclosures and final writeups	25	15	10

Figure 3: Design Schedule Plan

We prioritized scheduling hardware first due to the turnaround time in obtaining our PCBs from the manufacturer. We aimed to finish a week prior to the final due date to allow us to debug any remaining issues.

Server Side

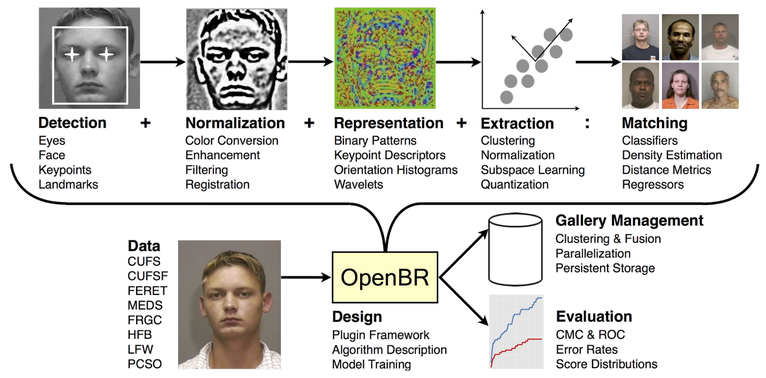

Figure 4: OpenBR Facial Recognition Algorithm

The server software houses the facial recognition algorithm and natural language processing unit, as well as the database of stored faces. It connects to OmniView through WiFi and waits for a picture. Once it receives a picture, the server responds back with the matching name which OmniView displays.

Embedded Software

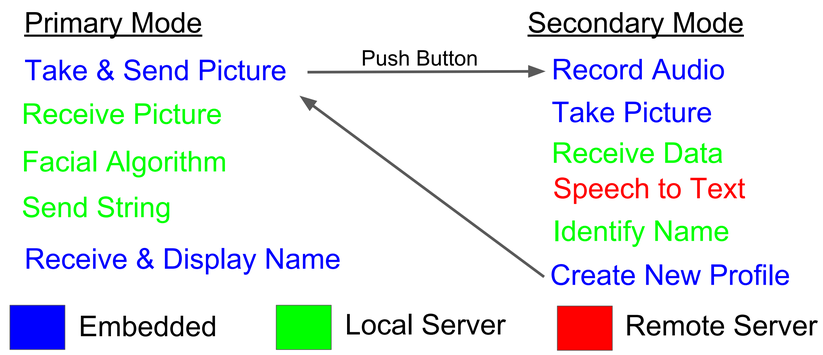

Figure 5: Operation Modes

OmniView has two modes, primary and secondary. Primary mode is the normal mode of operation which displays people's names. Secondary mode adds new people to your database by recording their introduction then storing their parsed name with their picture.

Hardware

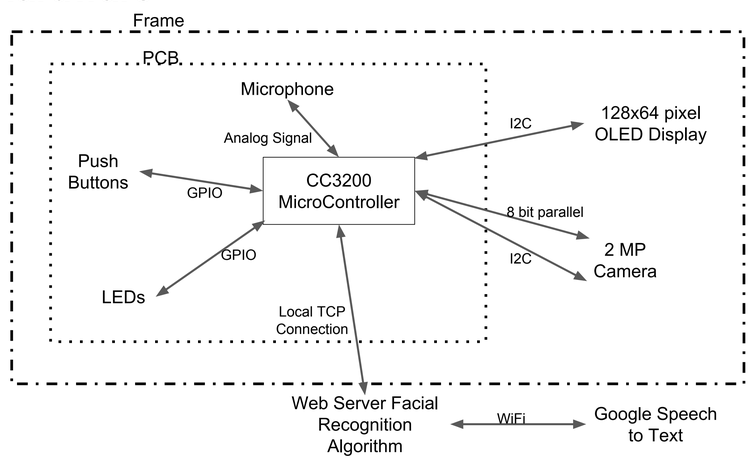

Figure 6: Hardware Schematic Layout

Our design goals were to stay small, lightweight, and power-efficient. Eventually we decided on TI's CC3200 microcontroller. The microcontroller contains an ARM Cortex M4 processor and an on-board wi-fi module which we use to connect to the server. The I2C lines are used to connect to both the camera and display. The camera has a resolution of 2MP while the display contains 128x64 pixels.