MOUSE USING EYE TRACKING

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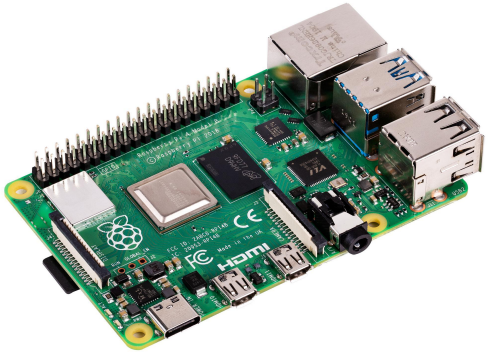
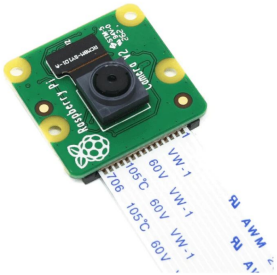
OBJECTIVE

- Developing a mouse emulation system for individuals with disabilities, leveraging both hardware and software components.
- Implementing an eye-tracking technology with a Raspberry Pi, allowing users to control the mouse pointer by tracking their eye movements.
- Leveraged Mediapipe and PyAutoGUI libraries
- Orchestrating the setup of a Raspberry Pi access point for seamless Wi-Fi connectivity with a laptop, enabling real-time visual capture and eye movement tracking using the Raspberry Pi camera.

COMPONENTS USED





- **Raspberry Pi:** Leveraged as an access point for data transmission via TCP/IP to a PC. Utilizing Mediapipe library and OpenCV , extending its capabilities beyond basic computing tasks.
- **Raspberry Pi Camera:** Integrated with Raspberry Pi boards, offering an affordable and versatile solution for capturing images and video. Enhanced Raspberry Pi projects with capabilities for photography, videography, surveillance, and computer vision applications.

LIBRARIES USED

- **Mediapipe library :** Machine learning models for tasks such as object detection, pose estimation, facial recognition, and more.
- **PyAutoGUI library :** A Python library facilitating cross-platform automation of mouse and keyboard interactions.

BLOCK DIAGRAM

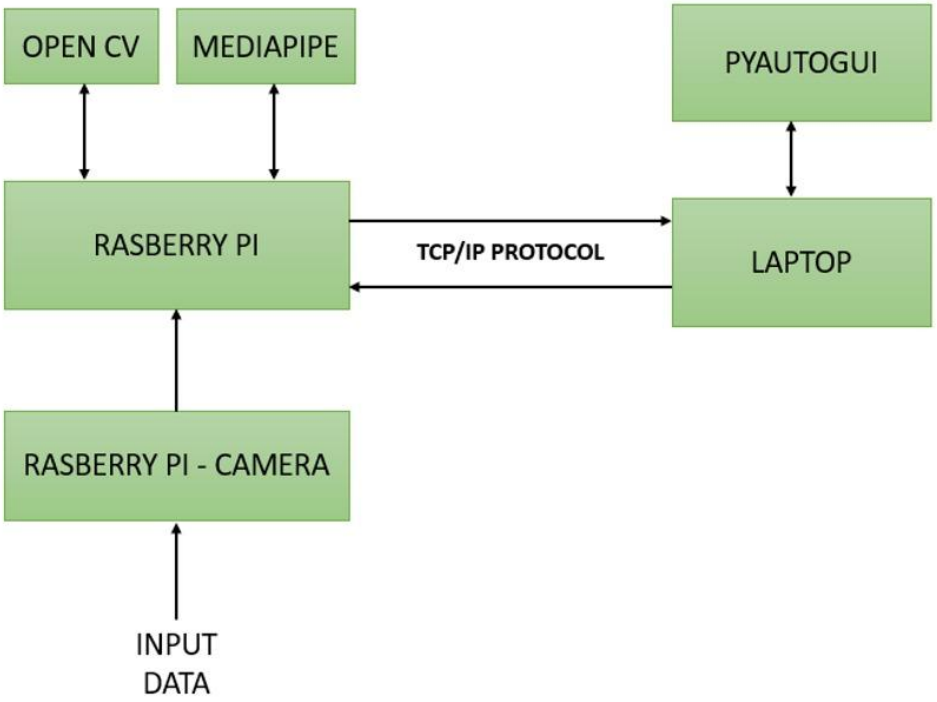


FIGURE 1

PRODUCT DEVELOPMENT

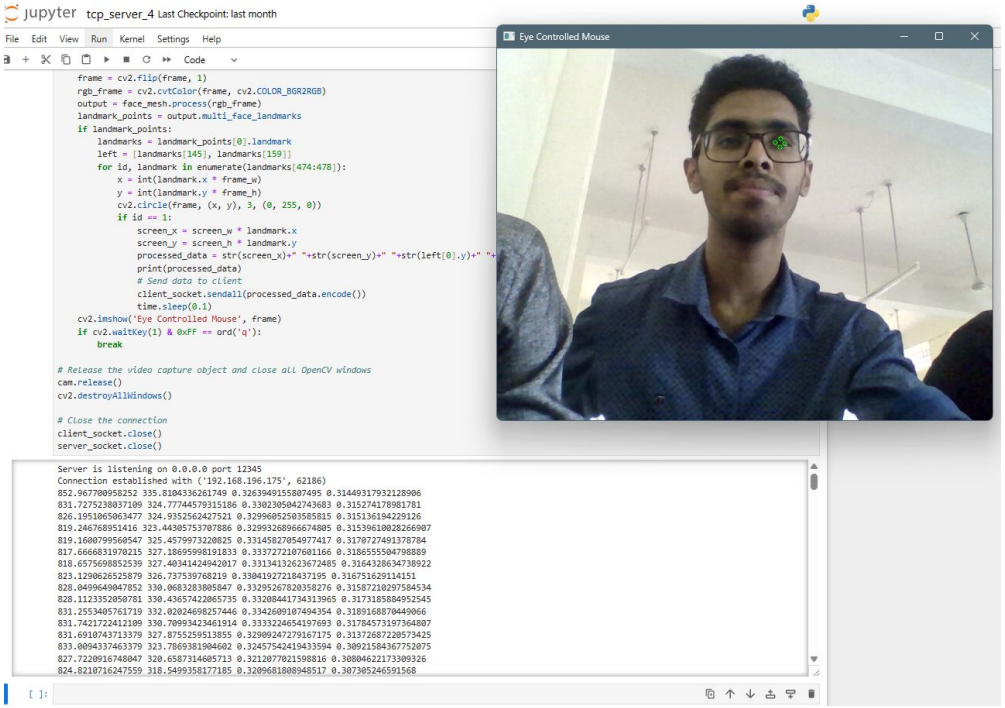
1. **DEMO CODE CHECK:**

- Step 1 : Used webcam of a laptop to track eye coordinates and moved it's own mouse cursor.

- Step 2 : Eye coordinates were tracked using the webcam of one laptop. These coordinates were then transmitted over a common WiFi network via the TCP/IP Protocol to another laptop, which utilized the data to move its cursor

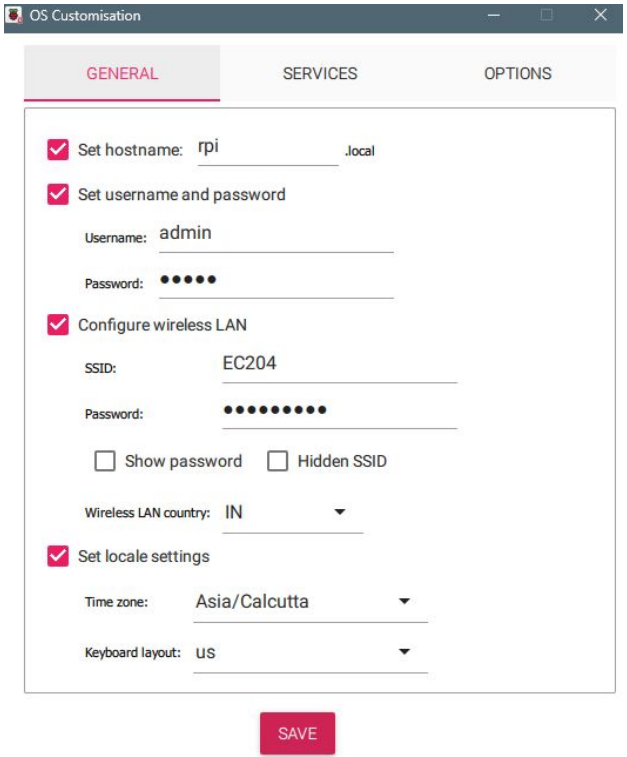
1. **DEMO CODE CHECK:**

- Step 3 :We eliminated the need for an external WiFi network. Instead, we configured one laptop as an access point, with the other laptop connecting directly to it.



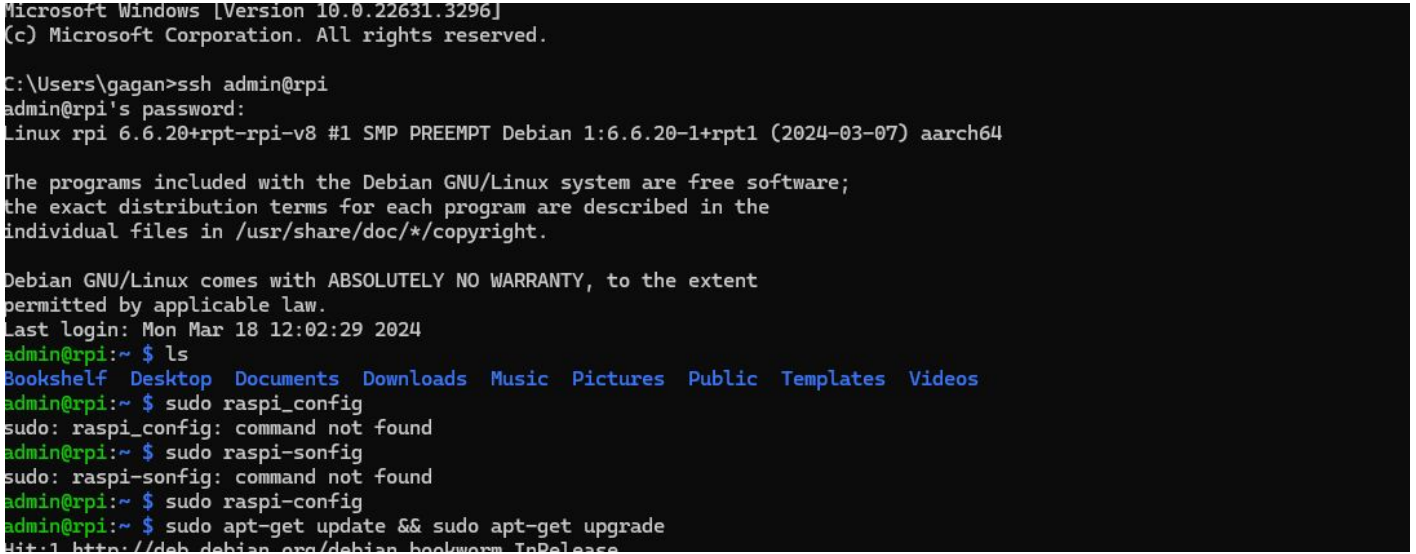
2. **HARDWARE :**

- 32 bit OS for Raspberry Pi 4B was Configured and Installed



2. **HARDWARE :**

- In order to use Raspberry Pi Headless ,we SSH (Secure Socket Shell) into Raspberry Pi via terminal



2. **HARDWARE :**

- Dependencies like OpenCV , Mediapipe were installed
- Virtual environment is created using venv module
- Used shell commands to access file and transfer them between a laptop
- Picture was captured using Raspberry Pi camera

FURTHER PLANS

- We've successfully developed code that tracks eye movements using one laptop and moves the cursor of another laptop without relying on an external WiFi network.
- Next step is to obtain videocapture by Raspberry Pi camera. If camera is working properly, import code to Raspberry Pi.
- After ensuring proper working , we can upgrade code for tracking eyeball movement and ensure more accuracy to the product.

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