

Raspberry Pi using Monocular Display

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Objective

- The main objective of this project is to build a portable Linux based computer using a Monocular Display.
- By using the OpenCV libraries, we can implement Face Recognition using the Raspberry Pi Cam built into the model itself.
- Using the Geany IDE, which allows users to code in more than 50+ programming and scripting languages.



Why a wearable device?

- Portable Linux based computer.
- Convenient to use.
- Eliminates the need of desktops and notebooks.
- Peripherals can be connected via Bluetooth.



Literature survey

Sr. No.	Authors	Contributions
1	Severance & Fontichiaro	Researchers discussed the history of Raspberry Pi's development and potential applications of Pi in classrooms for engaging students in programming.
2	Lynn	<p>Lynn discussed the main idea of using Raspberry Pi was getting students engaged in computing and learning to program</p> <p>However, Raspberry Pi was used as a standalone computer to compose music, drawings and build robots</p>
3	Ibrahim Mohammad Sayem ; Mohammad Sanaullah Chowdhury	The proposed system can implement face recognition even from poor quality images performing well over both known and unknown datasets. Face recognition leverages techniques from the OpenCV library and is written in the Python language.
4	Ishita Gupta ; Varsha Patil ; Chaitali Kadam ; Shreya Dumbre	<p>This paper aims at taking face recognition to a level in which the system can replace the use of passwords and RF I-Cards for access to high security systems and buildings.</p> <p>With the use of the Raspberry Pi kit, we aim at making the system cost effective and easy to use, with high performance.</p>

Technologies used

Hardware:

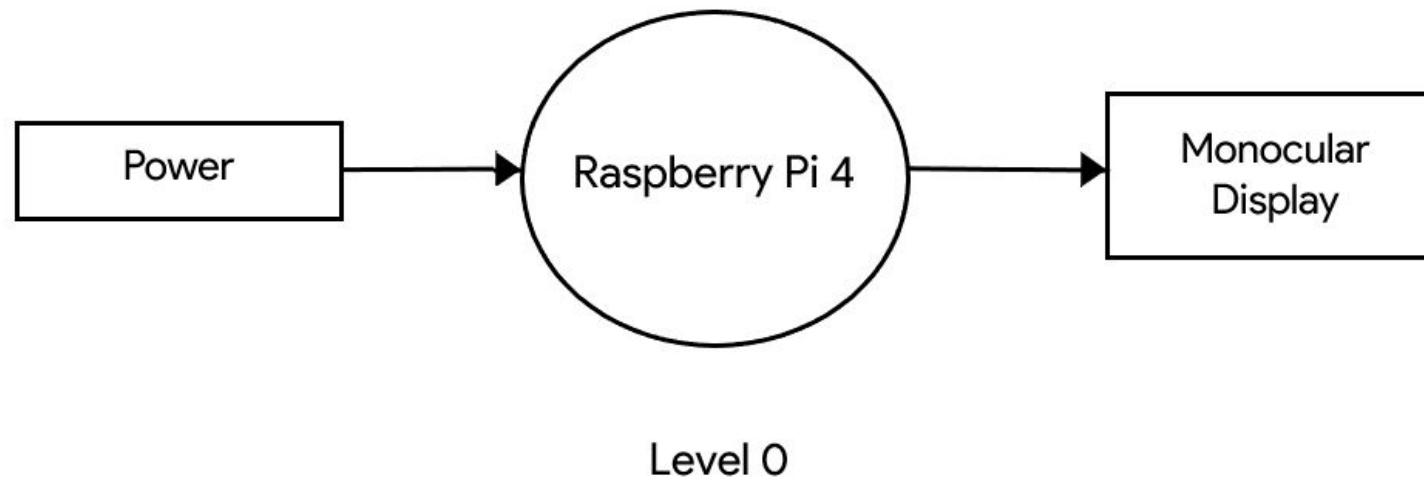
- Raspberry Pi 4
- Monocular Display
- HDMI to AV converter
- Raspberry PiCam

Software:

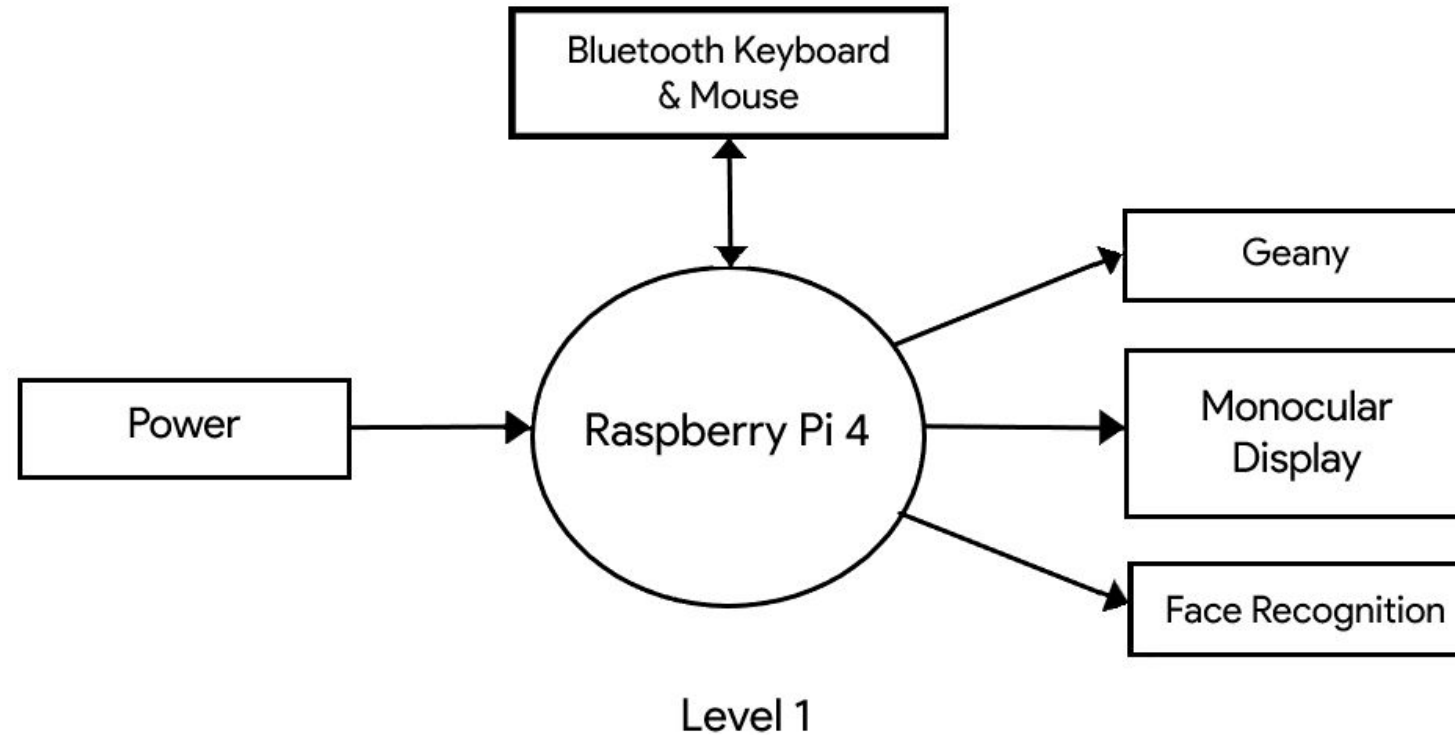
- Raspbian OS
- OpenCV
- Geany IDE



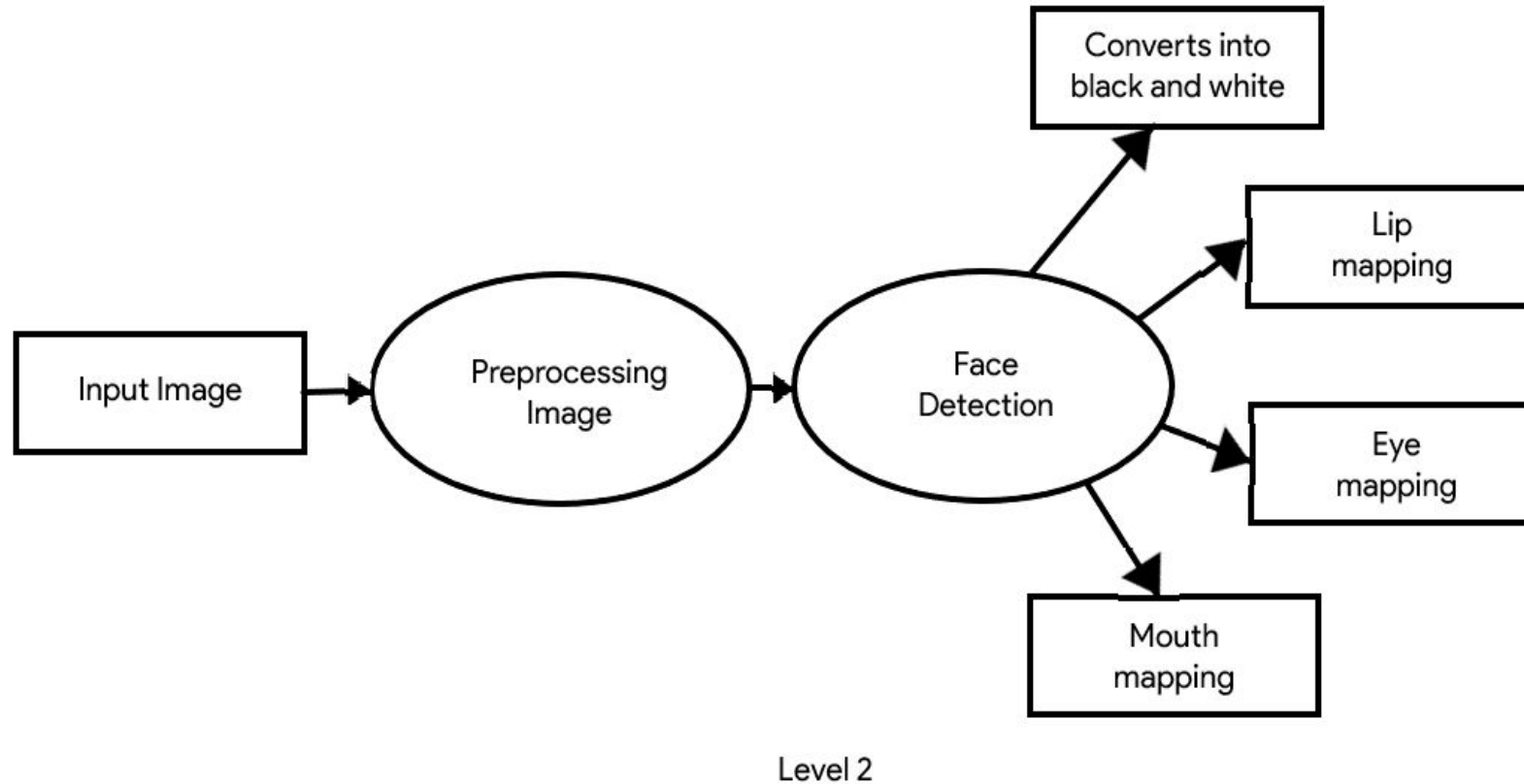
Data Flow Diagram



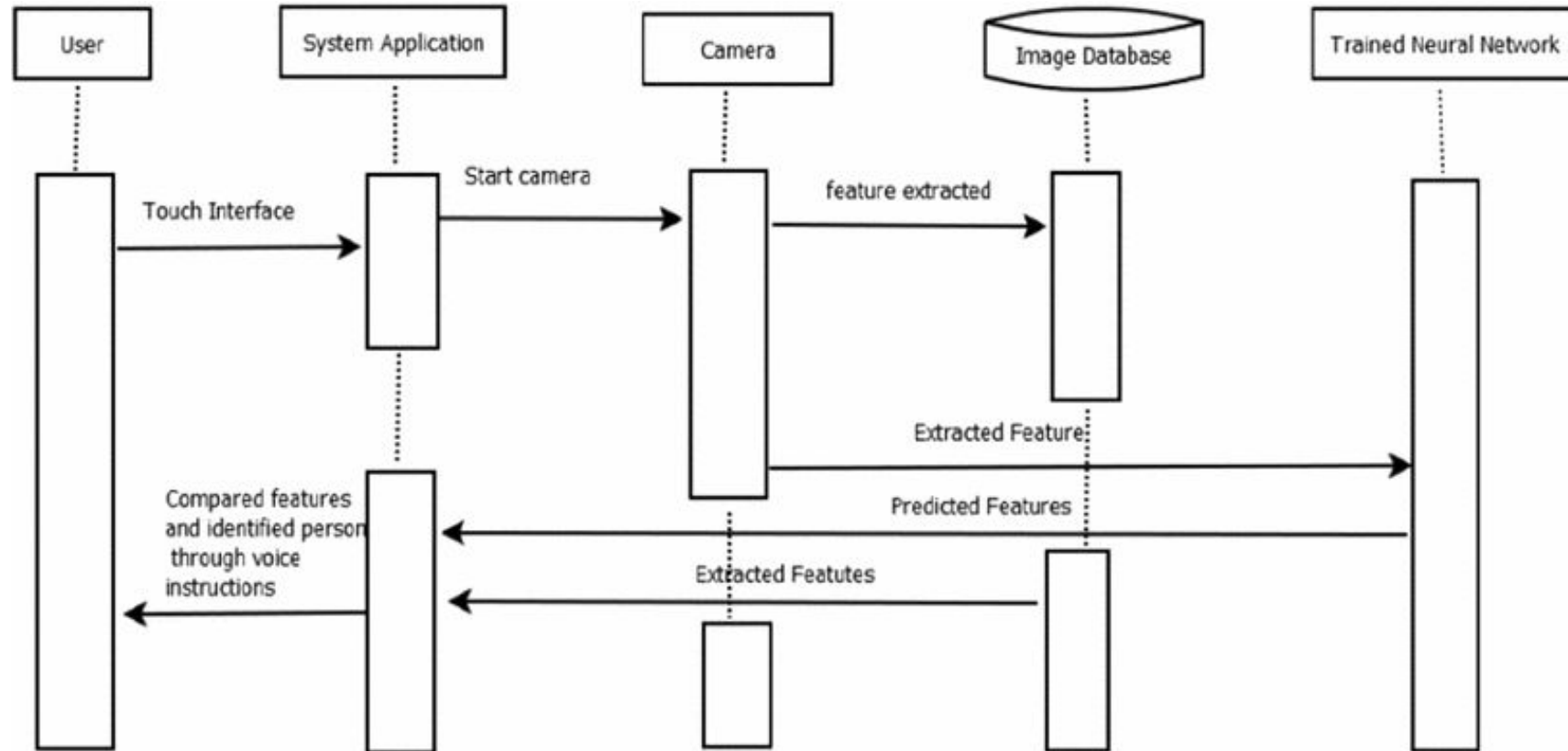
Data Flow Diagram



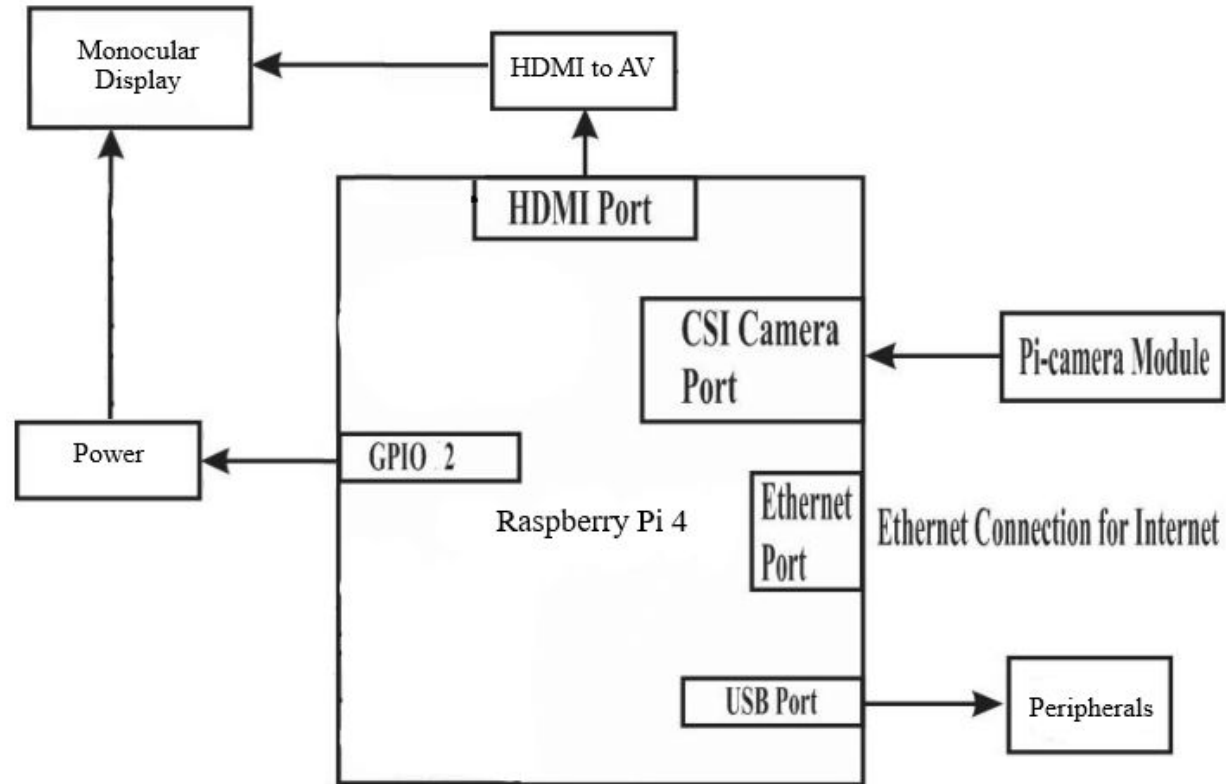
Data Flow Diagram



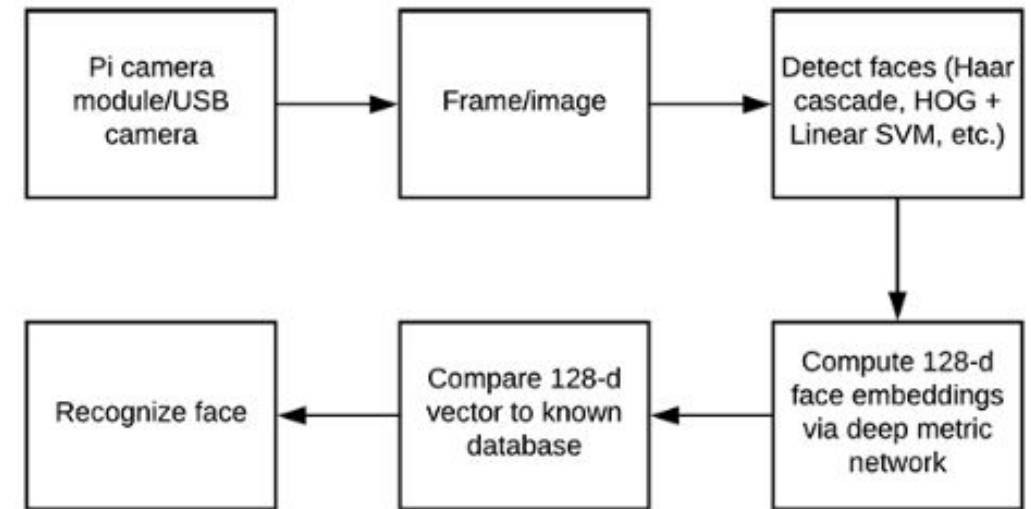
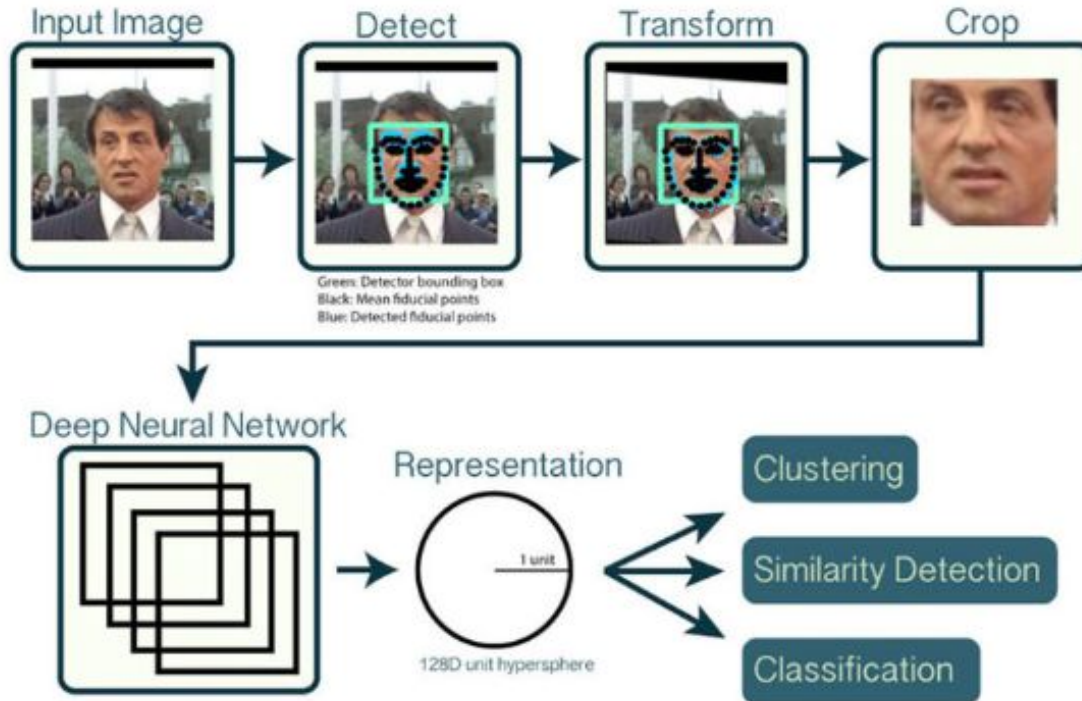
UML Diagram



Block Diagram



Working of OpenCV



Applications

A device which would allow users to code and to provide users a Linux based wearable computer right up to their eye; which can be used in situations like in a commute or when a desktop is not available. PiCam attached to the glasses can be used for Face Recognition and also as a regular camera.

- In commute
- For full-stack developers
- For security (Recognizing faces)

Limitations

- Expensive
- Delicate
- Battery capacity/size can be a limitation
- Long time of use can lead to eye strain

References

- Vufine

<https://store.vufine.com/products/vufine-wearable-display-2>

- Instructables

<https://www.instructables.com/id/RaspberryPi-Powered-Wearable-Computer/>

- Geany IDE

<https://raspberrypi-projects.com/pi/programming-in-c/compiler-and-ides/geany/installing-geany>

- Face Recognition

<https://www.pyimagesearch.com/2018/06/25/raspberry-pi-face-recognition/>