MINI PROJECT

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Synopsis

Team Members

Sumit Mishra

(University Roll No: 191500826

Yashi Mishra

(University Roll No: 191500938)

Supervised By

Mohd. Amir Khan

Technical Trainer

Department of Computer Science Engineering & Applications

GESTURE HOME AUTOMATION

Introduction

This project is made for the convenience of the people who are old aged or disabled and they can‘t walk. And there is no one who is always with them for 24 hours. Controlling electric home appliances and gadgets with the help of switches is difficult for old and disabled people. The main motive of this project is to help them by automating the control of electrical home appliances using hand gestures and patterns. This model uses a hand gesture recognition system to automate various home devices like lights, fans, etc. This system uses real-time image processing for hand gesture recognition by using Mediapipe and OpenCV.

And after connecting our gesture recognition Machine Learning model with IoT devices we can operate with our home appliances.

This project uses a large set of hand gesture datasets to train the Machine Learning model.

Objective

- The objective of this project is to implement a low-cost, reliable and scalable home automation system.
- To provide comfort and convenience for every user, especially disabled or blind.
- Suitable for physically impaired people to operate the devices within the home.
- Adds Safety Through Appliance and Lighting Control.
- Devices can be controlled more comfortably.
- Low Power Consumption.

Working Methodology

- Gesture-controlled home automation is utilized to control and work the home apparatuses for diversely debilitated people.

- The entire procedure depends on picture handling utilizing a mediapipe library and microcontroller.
- The video contribution for this procedure is taken utilizing a Web camera. By running the CV program the camera is turned on following a couple of moments. At that point, the video begins pursuing that if the signal is appeared against the video running in the constant procedure. The postponed time for catching the picture in the running video is settled. At long last, the video is changed over into the casings.
- The information obtained by a web camera is bolstered as a contribution to CV and a microcontroller is utilized to send controlling signs to the gadgets.

Software Specifications

- Technology Implemented : Computer Vision , IOT
- Language Used : Python
- Development Environment : Pycharm
- Web Browser : Chrome / Firefox

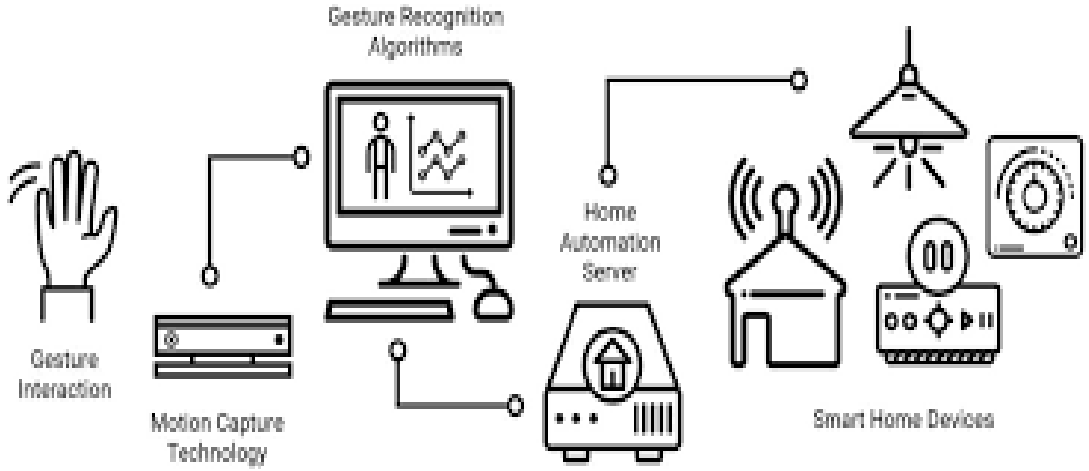
Hardware Requirements

- Processor : intel i3
- Operating System : Windows 7/8/10
- RAM : 8 GB
- Hard disk : 64 GB
- Hardware Devices : Arduino Uno

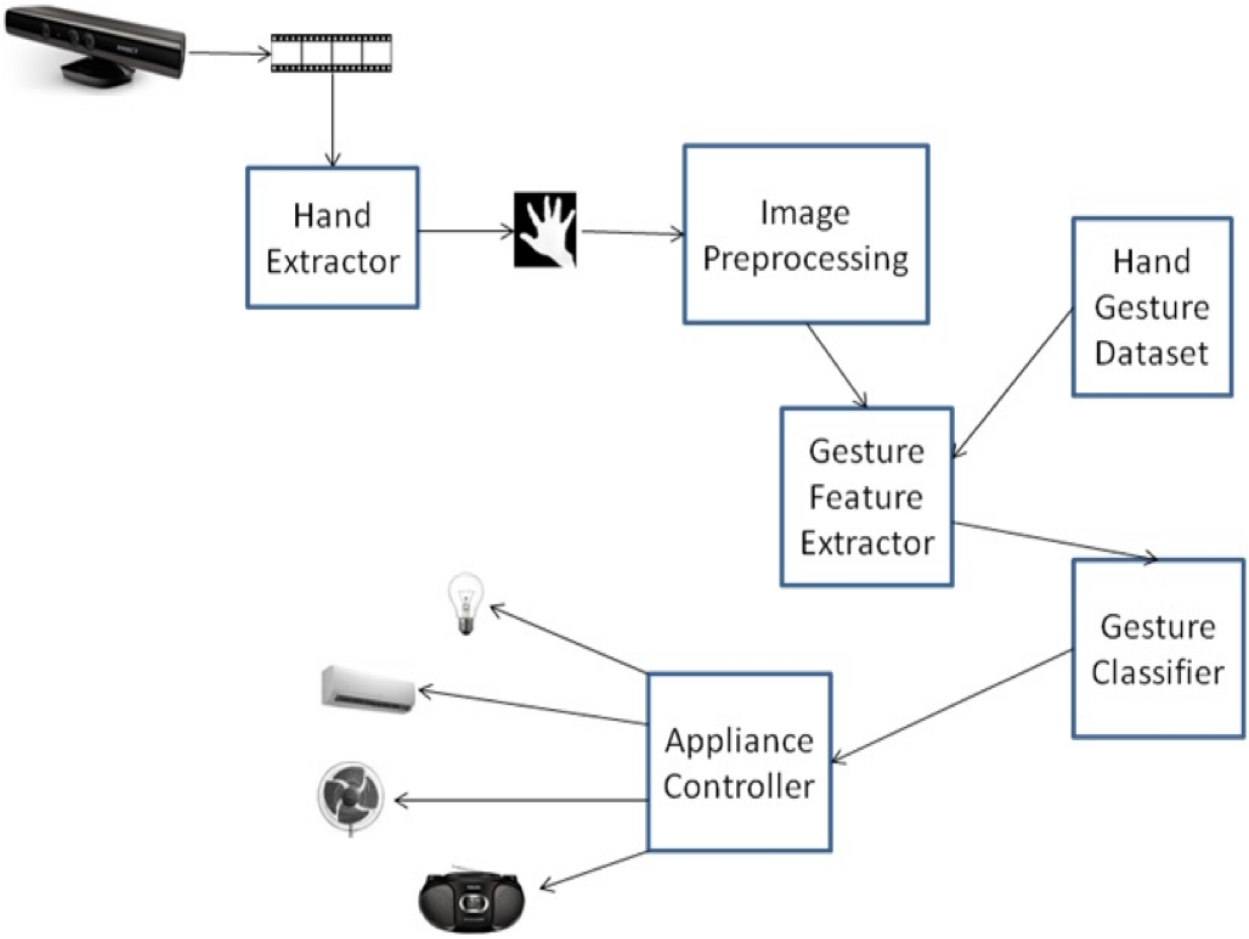
Existing System-

Many existing home automation systems with gesture recognition use hand-crafted techniques like Speeded up Robust Features (SURF), Histogram of Oriented Gradients(HOG), and Local Binary Patterns (LBP) for the purpose of feature extraction.

System Architecture-



Flow Chart-



Advantages -

- Low power requirement
- Simple circuitry as it does not require special hardware
- Devices can be controlled more comfortably
- Helps to overcome situations where normal cabling is difficult as well as financially impractical
- Suitable for physically impaired people to operate the devices within the room

Future Scope-

Hand motions are utilized to control the home machines, for example, fans, lights, and so on. The platform accessed for the acknowledgment of the motion is the computer vision reproduction apparatus. The future headway will be founded on the IoT premise, we can control the home apparatuses in and around the globe by the assistance of the web of things. The appliances use these motions to control volume tuning, TV channels, speed controls, and the controller of a fan can be controlled by the signal. In future progression innovations, motions can be utilized to control autos and even programming applications.

Online Git repository-

https://github.com/Sumit0730/Gesture-Home-Automation

Conclusion-

The objective of this project is to develop a system that will help the physically impaired or anyone to control home appliances by hand gestures using a webcam. This provides comfort and convenience for common users as well, especially in-home systems. Wireless technology is used for home automation for the physically impaired. In this system, physically impaired people use the home appliances very easily or they are comfortable with using the devices. This system is simple for operating the devices, this will be replaced by the remote-control instead of pushing the button there for this system will be very suitable for operating the home appliances.

References:

- www.google.com
- https://mediapipe.dev/
- https://opencv.org/