Gesture Recognition using IoT and Machine Learning

GUIDE

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By
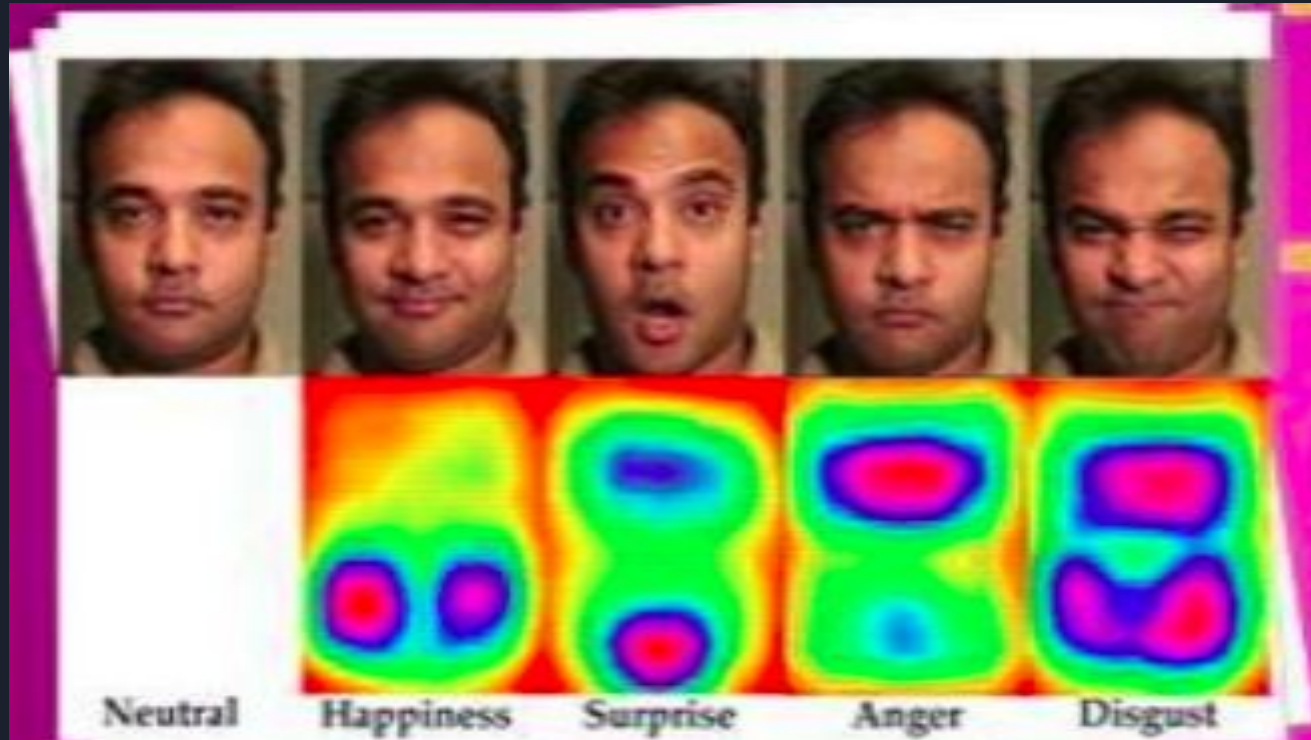
Abirami A   (14I302)

Overview

➢ Introduction

➢ Proposed Work

➢ Implementation

➢ Challenges

INTRODUCTION

- A gesture is a non-verbal communication in which visible body communicates particular message
- Motion of body that contains information
- Enables humans to interface with the machine (HMI) and interact naturally without any mechanical devices
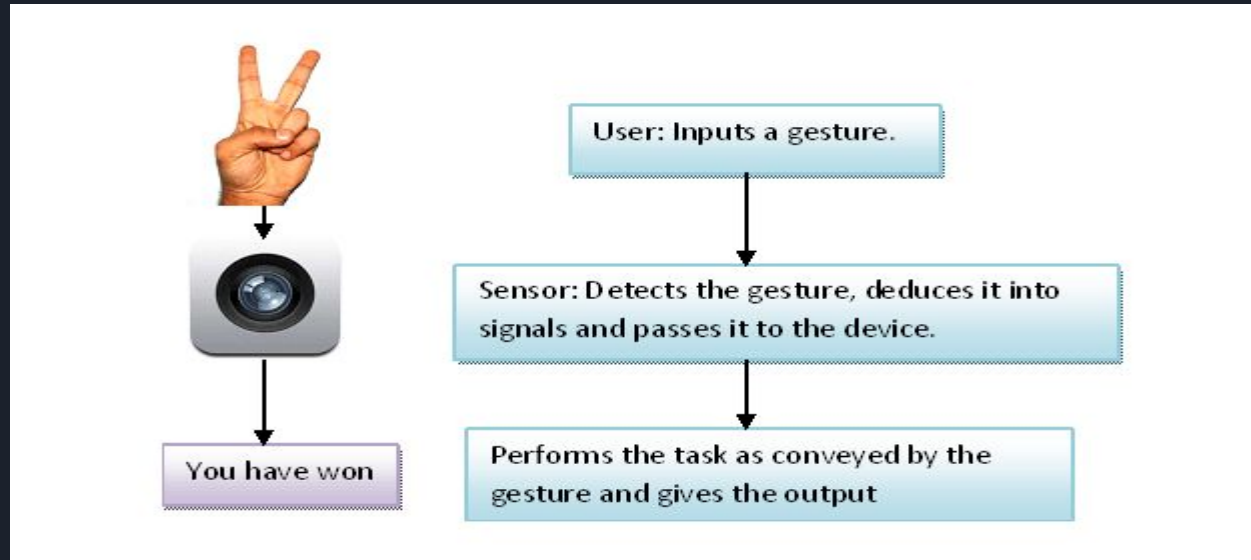
Facial gesture detection

Neutral   Happiness   Surprise   Anger   Disgust
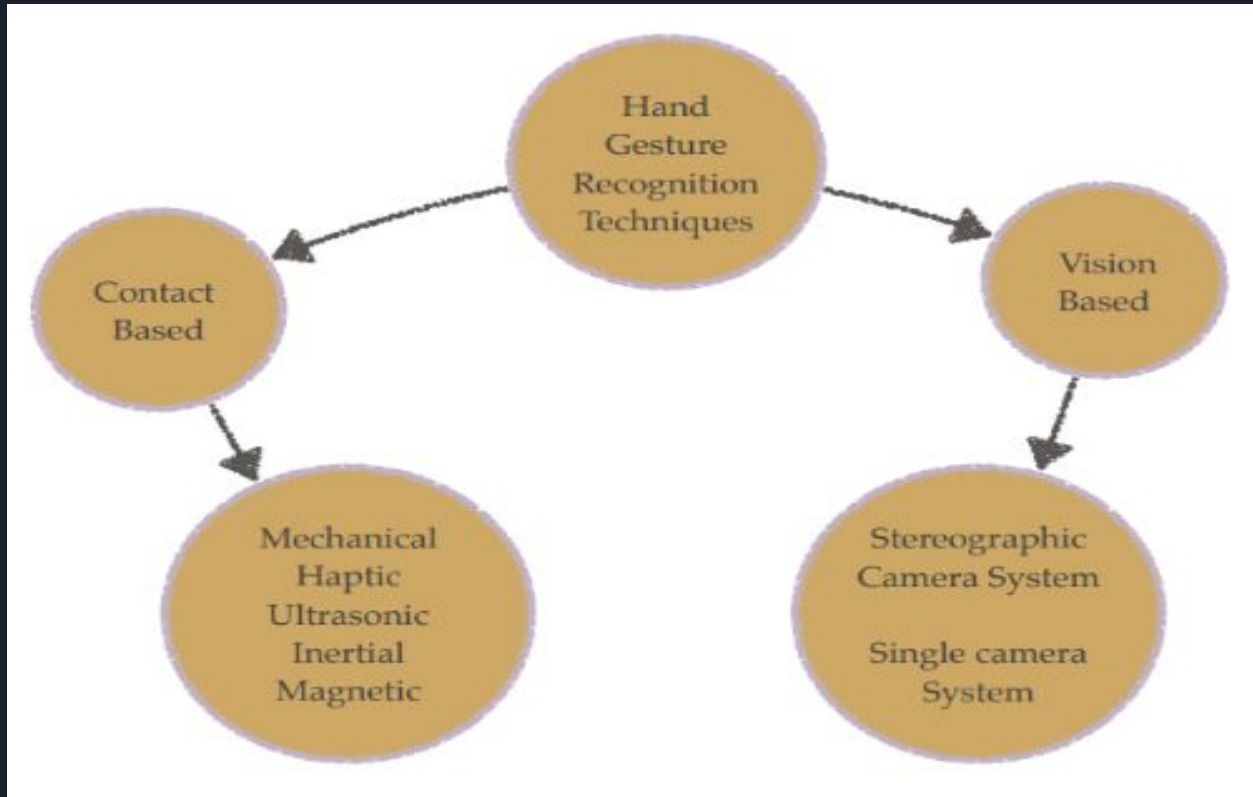
Sign language recognition

Proposed work

- Recognize various gestures and provide them as input to the system using web camera or ultrasonic sensors

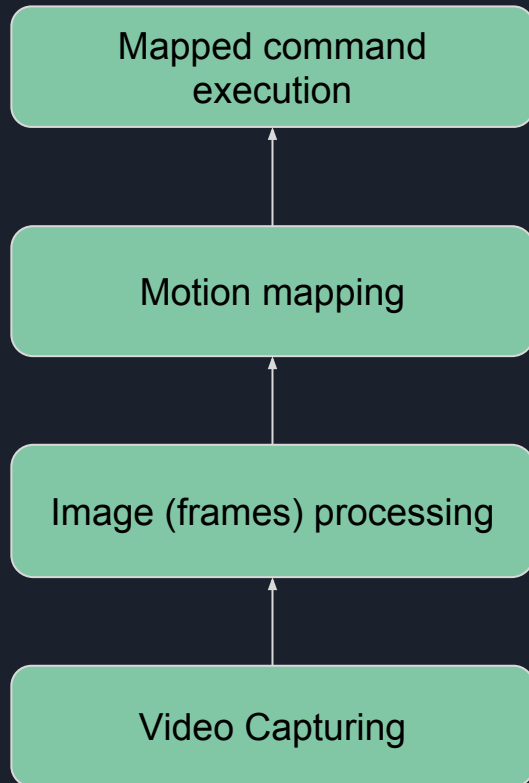- Convert the captured gestures into commands and perform related task in real time

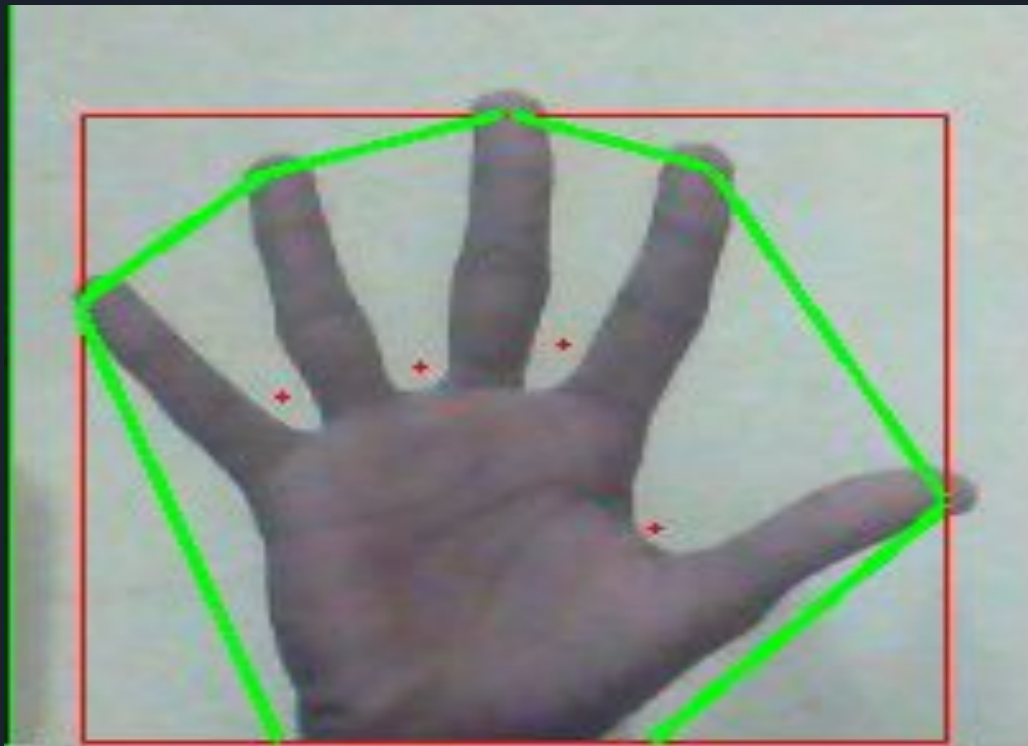# Hand Gesture Recognition Techniques

ARCHITECTURE

```
┌─────────────────────────────┐
│      Mapped command         │
│        execution            │
└─────────────────────────────┘
              ▲
              │
┌─────────────────────────────┐
│      Motion mapping         │
└─────────────────────────────┘
              ▲
              │
┌─────────────────────────────┐
│   Image (frames) processing │
└─────────────────────────────┘
              ▲
              │
┌─────────────────────────────┐
│      Video Capturing        │
└─────────────────────────────┘
```

Hand Detection

Tracking

Controlling VLC Media Player

System recognition architecture

MODULES

- **Action 1:** When both the hands are placed up before the sensor at a particular far distance then the video in VLC player should Play/Pause.

- **Action 2:** When right hand is placed up before the sensor at a particular far distance then the video should Fast Forward one step.

- **Action 3:** When left hand is placed up before the sensor at a particular far distance then the video should Rewind one step.

- **Action 4:** When right hand is placed up before the sensor at a particular near distance and then if moved towards the sensor the video should fast forward and if moved away the video should Rewind.

- **Action 5:** When left hand is placed up before the sensor at a particular near distance and then if moved towards the sensor the volume of video should increase and if moved away the volume should Decrease.

Key Features

Turn on/off

The user can perform certain switching actions based on preset distance values of different hands from 2 ultrasonic sensors
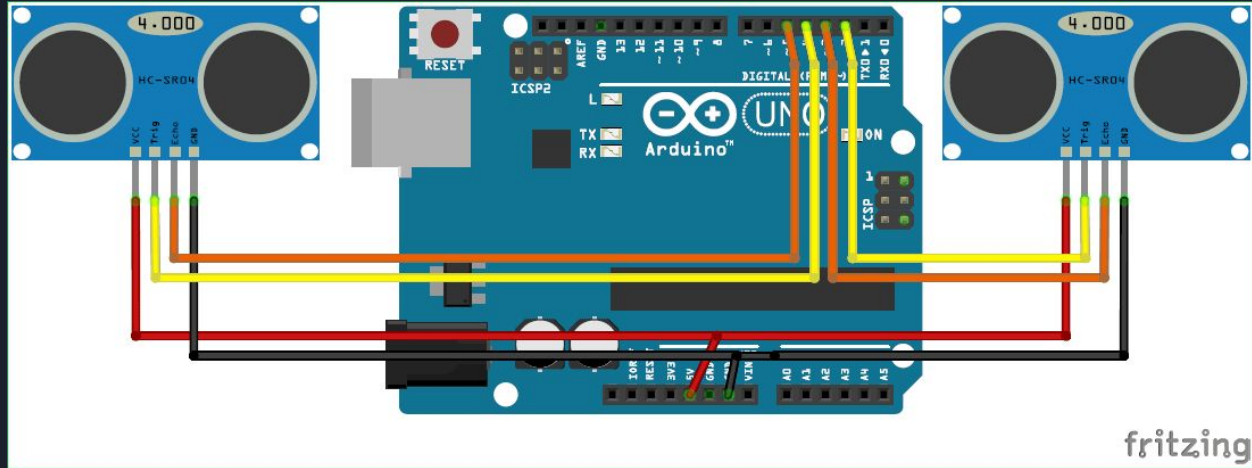
Volume Adjustment

The user can adjust intensity of volume or brightness based on front or back directional motions

Distance based options:

The user can perform different operations based on how far their hand is from their Ultrasonic sensors

Connections in Arduino UNO and Ultrasonic sensor

Challenges

- Latency
- Robustness
- Performance
- Lack of gesture language

THANKYOU.