# Hand Detection As Input

HDAI – FOSS project

An Insight into the project

The ability to perceive the shape and motion of hands can be a vital component in improving the user experience across a variety of technological domains and platforms.

This project concentrates on how a system could detect, recognize and interpret the hand recognition through computer vision with the challenging factors which variability in pose, orientation, location and scale.

This Project was initially intended for an advanced sign language recognition framework, however, was shaped into taking the hand recognition as a viable input for applications and systems.

PYTHON
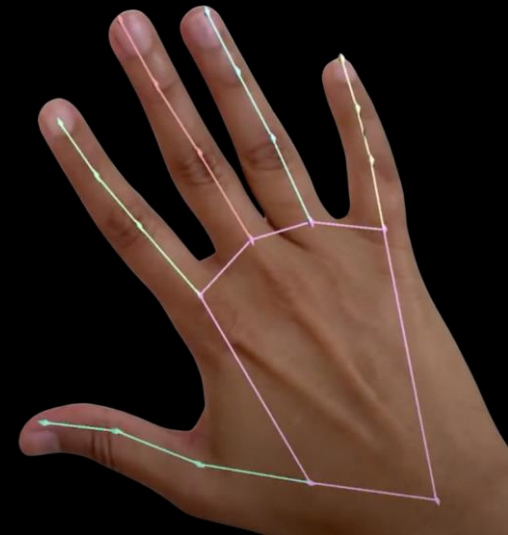
Libraries used :

OpenCV

OpenCV (Open Source Computer Vision Library) is an open source computer vision and machine learning software library. OpenCV was built to provide a common infrastructure for computer vision applications and to accelerate the use of machine perception in the commercial products.

Mediapipe

MediaPipe Hands is a high-fidelity hand and finger tracking solution. It employs machine learning (ML) to infer 21 3D landmarks of a hand from just a single frame. Whereas current state-of-the-art approaches rely primarily on powerful desktop environments for inference, our method achieves real-time performance on a mobile phone, and even scales to multiple hands. We hope that providing this hand perception functionality to the wider research and development community will result in an emergence of creative use cases, stimulating new applications and new research avenues.

PYTHON

Libraries used :

PyAutoGui

PyAutoGUI is a Python library that provides cross-platform control of the mouse and keyboard. It allows you to automate tasks by programmatically controlling mouse movements, clicks, and keyboard inputs.

pynput

pynput is also apparently Python library that allows you to control and monitor input devices such as keyboards and mice

Tkinter

Tkinter is a standard Python library for creating graphical user interfaces (GUIs).

Difficulties my project may face ?

- Accuracy and Reliability :
  Different lighting conditions and varying hand positions are a challenging
  factor for this project

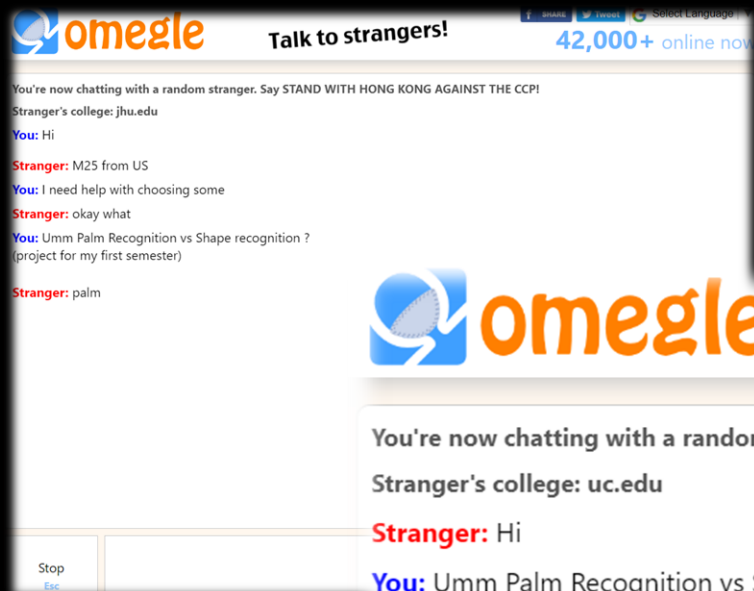- Performance Optimization Issues :
  Real-time processing is computationally intensive, making the code faster comes
  with its challenges (bugs with a/r)

- UI and UX :
  Developing a good UI/UX based application is a goal before a mainstream release

Initial Resources :

Help from some anonymous users on the internet

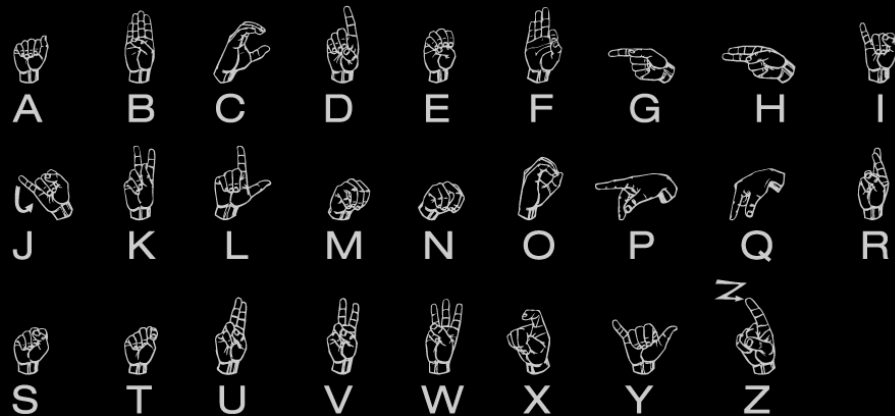Help From an article on finger counting
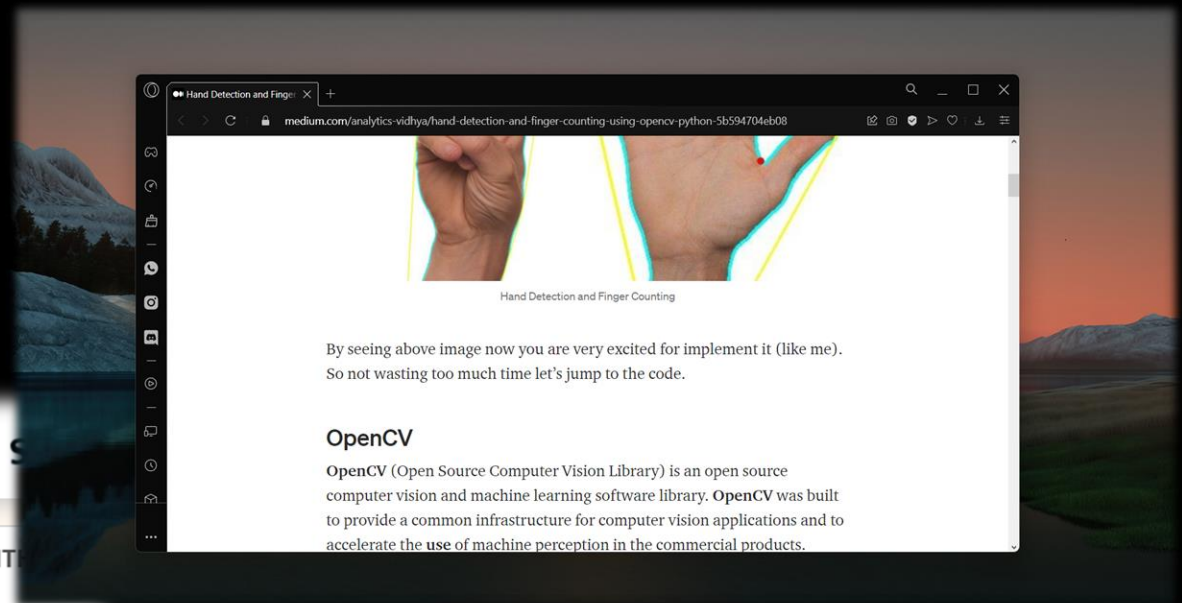
Future design prospects :

Yeah This

Sign Language translation :

(I was trying for this but I had lots of bugs with the tensorflow package)

Motion Tracking Tech:

with MetaVerse growing
this could be a cheaper and portable
alternative to motion sensors

A simple camera
on the VR
headset itself
can detect hands
without
additional
gadgets.

Thank You

for going through my repository and this file.

Purpose : to upload something, so this was the basic description of the based project

Also, apologies if I included any copyrighted images, will remove them with the next update to this file

PS: Working on an update schedule so this doesn't end-up like the previous projects I've taken up and left (into the abyss…)