

Progress Report

Group member:

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SUPERVISOR: DR. ABDUL HAFEEZ

In progress: Hand Gesture Recognition

Progress Report: 04

Data: 4/1/2022

**Gesture control game with computer vision and
machine learning**

1.1) Introduction:

The keyboard is the static and traditional method to interact with computers and games, for which players need to sit on a chair at a corner in a static position for a long time. Which affects health, especially repetitive strain injury (R.S.I) and blood circulation due to sitting on a place for a long time in a static position.

To avoid or minimize the use of Graphical User Interface (keyboard and screen-touch), we are creating gesture control With help of computer vision and machine learning, with help we could control games with human gestures and body motion/expressions.

Benefits:

- Long time pc use but healthy
- Get enjoyment and body exercise
- Make the games more interesting
- Dynamic physical interaction with pc
- No need of extra hardware
- Less cost effective

1.2) Work Flow Chart

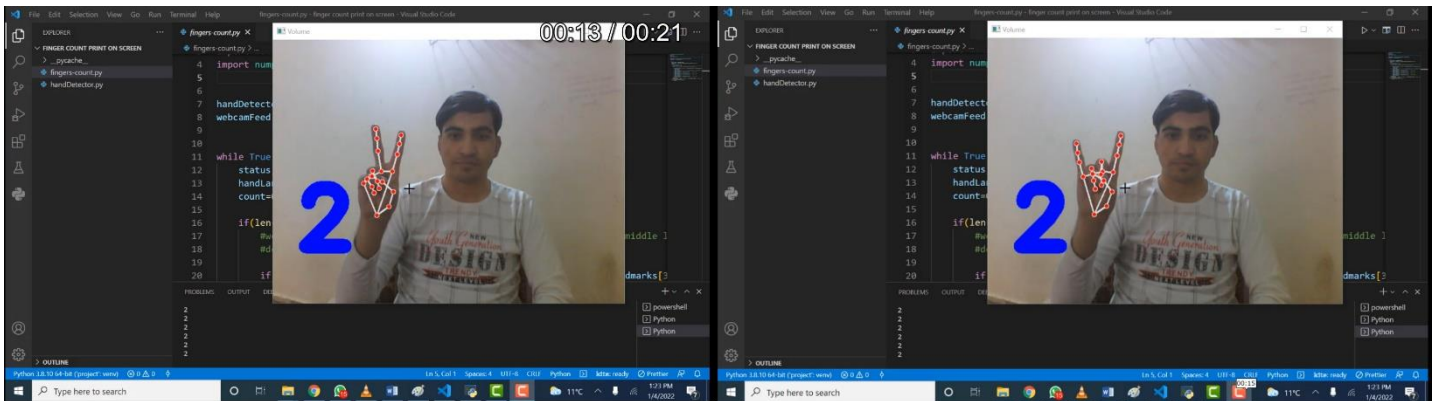
Semester weeks	Milestone	working weeks	status
6 th and 7 th Dec 06 to Dec 17, 2021	Gather dependencies +hand tracking	2 weeks	✓ Completed
Mid term Dec 20 to Dec 24, 2021	Mid term	Mid term	✓ Completed
8 th to 11 th Dec 27 to jan 21, 2022	Gesture recognitions model + deploy model ongame	4 weeks	🔄 In progress
12 th to 15 th Jan 24 to Feb 18, 2022	Website + server + database for storing playerdata + thesis	3 weeks	upcoming
Finial term exam Feb 21 to Feb 25, 2022	Finial term exam	Presentation: game controlwith hand gesture and store car break and gas data in database. Note: computer vision workalmost complete	Upcoming

8th semester	Milestone	Working weeks	Status
1 to 3 rd Mar 21 to Apr. 08, 2022	Total time taken and distance travel collect and store in database.	3 weeks	Upcoming
4 th to 7 th April 11 to May 06, 2022	Collect data (No of breaks, gas, total time taken, distance travel) and create and deploy machine learning model for next game score.	4 weeks Note: project complete	Upcoming
Midterm exam May 09 to May 13, 2022	Midterm exam	Midterm: present complete hand tracking and hand control game with machine learning prediction	upcoming
8th to 15th May 16 to July 8, 2022	Maintenance + possible improvement + thesis	8 weeks	Upcoming

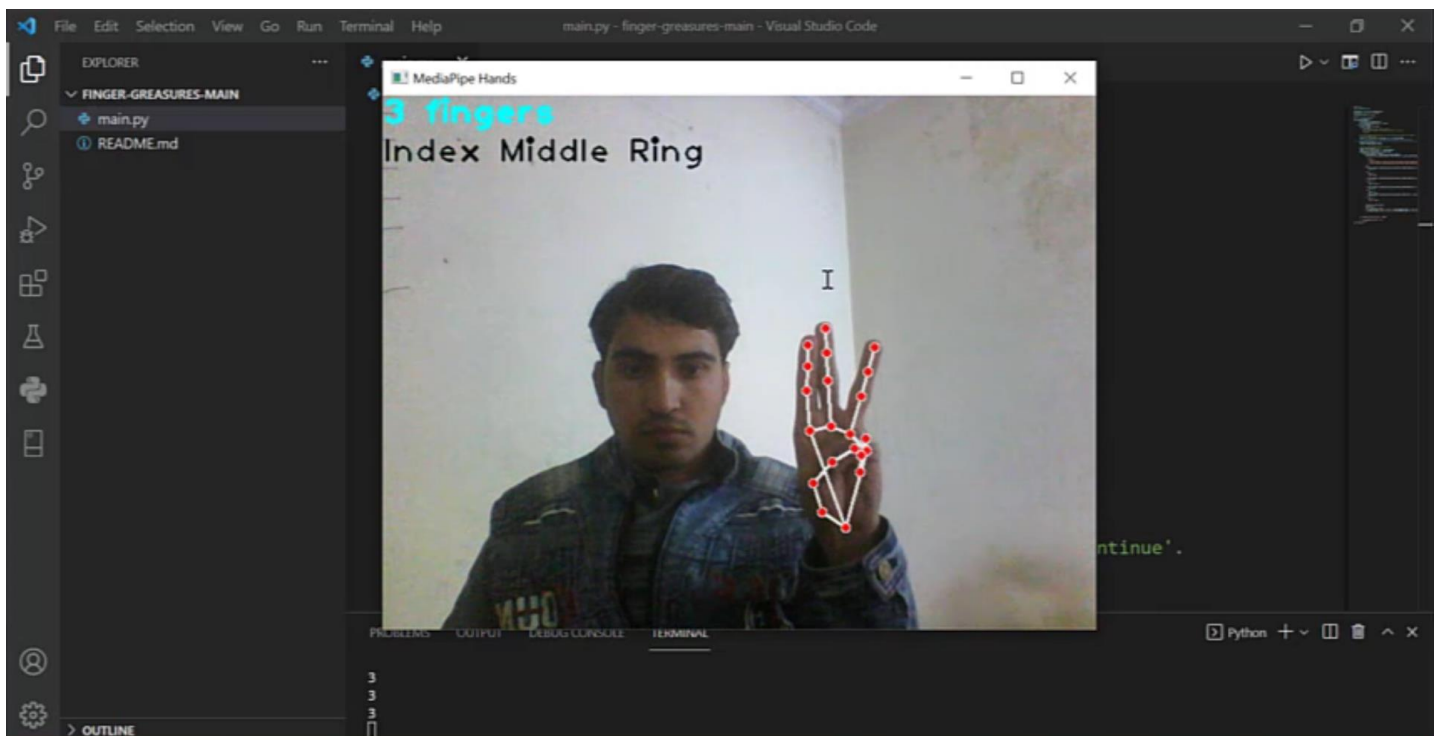
1.4) **Problem (finger name and position Recognitions)** **✓ Completed (15/1/2021)**

Our model can count fingers and can show/print the number of fingers up on the screen, but can recognize the fingers. I.e. the 'V' sign, made by holding up the index and middle fingers. Our model does know about the number and name of fingers.

We will train the model to recognize every finger. Which will lead us to feed some specific signs/gestures with some specific task/functionalities (gas and brake of a car) to control the game.



Problem (finger name and position Recognitions) **✓ Completed** (15/1/2021)



1.9 Enhancement

Hand Detection Speed FPS (frame per second): **🔄 in progress**

FPS (Frame per Second) defines how fast your object detection model process your video and generates the desired output. The first step for any custom object detection is to grab images for labeling.

To avoid latency and increase reliability to we have to improve the FPS of our model to make the hand detection faster and player play the in more reliable and feel dynamic.

1.5) Summary:

The hand tracking model is completed. The gesture recognition model is in progress. The hand detection speed is a very important factor in our project and it's very hard to detect hands and recognize the gestures with 25 to 30 FPS. For that we are training a model with finger count and then will convert it into different gestures signs.

GitHub link:

<https://github.com/Finial-Year-Project-FYP/Hand-Gesture-Control-Game-With-CV-and-ML-FYP/pull/3>

GitHub code link:

[https://github.com/Finial-Year-Project-FYP/Hand-Gesture-Control-Game-With-CV-and-ML-FYP/tree/main/working%20weeks%20\(8th%20to%2011th\)](https://github.com/Finial-Year-Project-FYP/Hand-Gesture-Control-Game-With-CV-and-ML-FYP/tree/main/working%20weeks%20(8th%20to%2011th))

Progress Report 03 link:

[https://github.com/Finial-Year-Project-FYP/Hand-Gesture-Control-Game-With-CV-and-ML-FYP/tree/main/working%20weeks%20\(8th%20to%2011th\)](https://github.com/Finial-Year-Project-FYP/Hand-Gesture-Control-Game-With-CV-and-ML-FYP/tree/main/working%20weeks%20(8th%20to%2011th))

Written By: Muhammad ijaz