

# Gesture Mouse

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## 1 Introduction

The Python project is based on computer vision to detect hand and its gestures to control mouse input. The project uses OpenCV and Pynput as primary python libraries to work.

## 2 Problem Description

The idea was just out of pure laziness. It is sometimes a pain to get up from a comfy position in the bed just to skip a YouTube ad. There should be an easy way to skip the ad, or even click on a different video from the comfort of the bed without having to get up.

## 3 Solution

This script provides a simple solution to the problem by using hand gestures to control the mouse. It uses a HAAR Cascade Classifier created by training the program against thousands of images to detect the required gestures. Further, the change in the detected coordinates between two consecutive frames is used to move the mouse on the screen using Pynput library. All the user has to do is move their hand with their fist clenched to move the mouse and opening the fist will result in a left mouse click.

## 4 Installation

Install all the dependencies from requirements.txt. The requirements.txt is a vague file as of now and 'pip install -r requirements.txt' won't work. Make sure to manually install all dependencies. 'python3 main.py' to run.

## 5 Progress

The project is in full working condition. However, the HAAR Cascade Classifier made (located as ./training\_data/negs/data/cascade.xml) needs more training. Initially I had used about 500 images for the training which did not work

out at all. Increasing it gradually, the current training stands at about 7000 generated(using OpenCV dev- tools) positive images at 10 stages. The current dataset detects consistently but with some error. For the time being, to present the working of the project, a pre-trained HAAR Classifier has been included in the project. I plan to use more images and a refined dataset for the same in the near future. The stability of the mouse, although not terrible, is something I would be working on to improve too.

## 6 Conclusions

- This project helped me learn Python and the OpenCV framework a lot(even though there's still a lot more to learn)
- Definitely taught me to be patient as the training takes several hours and there were many failed attempts.
- Made me lazier ;)

## 7 References

- OpenCV Docs  
[https://docs.opencv.org/3.4/db/d28/tutorial\\_cascade\\_classifier.html](https://docs.opencv.org/3.4/db/d28/tutorial_cascade_classifier.html)
- Basic OpenCV  
<https://www.youtube.com/watch?v=-ZrDjwXZGxI>
- Advanced OpenCV  
<https://www.youtube.com/watch?v=-Mhy-5YNcG4&list=PLvVx81H-gGeC8XmmrsG855usswhwt5Tr1>
- HAAR Cascade  
<https://www.youtube.com/watch?v=88HdqNDQsEk>