

Project Proposal

Project Name: Mischievous Robot

PROJECT DESCRIPTION (< 150 words)

I want to create a robot that reads faces through a webcam and senses when an object is placed on a table. When the object is placed, the robot will then scan for faces that are looking towards the robot. If the face stops looking at the robot, the robot will attempt to tip over the object placed on the table. It will detect the gaze of the user by analyzing the gaze of the person in the frame of the webcam. The robot itself will be quite simple, consisting of a servo arm controlled by an ESP32. It will have a way of detecting if an object is placed by the

SOLUTION (Deliverables). Write a bullet point list of what you expect your software will achieve. I do not hold you to this list for your end-product.

- Detect if the user is blinking
- Detect where the user is looking by analyzing the users eyeballs
- The robot will detect an object placed near the robot and wait for UART commands
- The robot will swipe at the object with a servo motor
- Information will be gathered about the face, and graphically display it on the webcam video

DATASETS.

Data set for facial points for Dlib to analyze the face:

https://github.com/italojs/facial-landmarks-recognition/blob/master/shape_predictor_68_face_landmarks.dat

Expected Tools (Cloud DBs, Hardware, & Python Libraries to be used.)

Hardware: Laptop, ESP32, Wires, Copper Tape, USB-C cable

Python Libraries: Numpy, Open CV2, Dlib, Serial, Math, Serial, Time

Arduino Libraries: ESP32Servo.h

Rough Timeline:

Weeks	Project Task Timeline
3/19-3/31	Watch youtube videos on how to use CV2 and Dlib
4/1-4/11	Blink Detection
4/12-4/19	ESP32 Servo Code
4/20-4/21	ESP32 Object Sensing Code
4/21-5/1	Gaze Detection
5/2-5/3	UART communication from laptop to ESP32
5/4	Video Explanation and Github Repo