



Review on Smart Fan using Face Detection and Voice Assistant

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Abstract: In the past several years, face detection has been classified as one of the most engaging field in research department. The frontal human faces are detected using the Face Detection Algorithms. Face detection is used in many applications such as face tracking, face analysis, and face recognition. The term Face Recognition and detection encompasses a extensive area of research and innovation through the image analysis and algorithm-based understanding, also known as computer vision. Voice assistants helps you perform task quickly and in real time. The humans passes voice command to the system and thus the system executes the command.

Keywords: Python, Face Detection, Haar cascades classifier, OpenCV, Google, Text to Speech(GTTS), VS code, Arduino UNO.

INTRODUCTION:

The main idea behind project is to develop a "Smart Fan" with the help of facial detection and voice assistant by minimising human interaction and intervention. Almost every industry and field uses algorithms today.

A Haar Cascades classifier is a Machine Learning algorithm that is used to sense faces using a waterfall function. A Haar waterfall classifier is a Machine Learning approach composed up of a cascades function that is trained using lots of positive and negative images. A voice assistant will also be used to command the speed and movement of the fan. On passing over the voice command to the system will execute the passed function by which we could control the speed and direction of the fan.

BREIF LITERATURE REVIEW:

There's still lot of research is being is carried out by experts of the computational field. To detect the user's face in previous works, different algorithms were used. A plethora of research has taken place in the field of Face Detection and various other algorithms and techniques.

- Design and Implementation of Smart motor speed with Face recognition [1] :- This paper covers face detection and processing. Additionally, it includes different algorithms for audio recognition.
- Development of Intelligent Automatic Motor System [2] :- This paper covers face recognition speed controls. It also gives an replacement to use automated speed controls instead of conventional speed controls.
- Real time implementation of face recognition system [3] :- This paper covers the implementation of face recognition system.
- Motor Speed Control using Face detection[4] :- This paper gives the pictorial representation of how the model works. Also it deals with flow charts associated with it.
- Study of Automated Face recognition[5] :- This paper gives the example of recording the attendance in a new innovative way.
- Student Attendance in classroom records[6] :- This research paper was related to the study of the previous image processing techniques and their results.

**METHODOLOGY:**

The project Smart Fan is advance using the hardware components such as Arduino UNO, Servo motor ,An ordinary fan, USB cable and other power modules. It uses software such as VS studio code, Python as language , Open CV,GTTS. Python is used in coding the face detection algorithm along with Haar waterfall classifier which uses the information about how to determine the human faces. Open CV is used to run the face detection algorithm. Arduino UNO is used for the Arduino IDE for its coding purposes .Voice Assistant enabled in Fan using google text to speak library. Smart Fan advance uses less human efforts and making automation in offices, home and various places.

CONCLUSION:

Major problems of the ordinary fans such as higher human interactivity has been greatly reduced with the help of the face detection methods. Usability, controllability and comfortability shown has somewhat improved feedbacks compared with the normal ordinary fan since “Smart fan” consists of features that makes it user-friendly, effective and easier to use. In future, further this technique can be applied in the other electrical appliances that would make them more user friendly and less human intervention or interaction. Appliances such as refrigerator, lamps and ceiling fans in order to make each appliance connected and smarter in order to make a smart places like home, offices etc. Finally In this project, the necessary steps, methods, hardware and software is presented to create an automated smart fan using face detection and voice assistant. The camera is activated to do real time face detection for the time being the Arduino UNO is turned on to control the fan basic functionalities. The voice assistant will help in accessing the fan through the voice commands or functions pass to the system in order to operate the fan.

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