

ABSTRACT
ON
GESTURE RECOGNITION USING COMPUTER VISION AND MEDIAPIPE

Submitted to

DEPARTMENT

of

COMPUTER SCIENCE AND ENGINEERING

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ABSTRACT

INTRODUCTION:

In this project, the gestures posed by a hand are the main input sources that are used to give test cases to the trained Machine Learning model and this model uses features like landmarks to complete the project and give the output. Landmark is the identification portion in the model, landmarks are given at different points on palm of a hand using media pipe API, we have a list of points that identify different parts of the palm, and then gestures are made. In this project, we try to use computer vision, machine learning and try to recognize hand gestures. Gestures are made using hands, so they are distinguished using modules, and every gesture is stored to show on the output screen.

We present an on-device real-time hand gesture recognition (HGR) system, which detects a set of predefined static gestures from a single RGB camera. The system consists of two parts: a hand skeleton tracker and a gesture classifier. We use Media Pipe Hands as the basis of the hand skeleton tracker, improve the key point accuracy, and add the estimation of 3D key points in a world metric space. We create two different gesture classifiers, one based on heuristics and the other using neural networks (NN).

EXISTING SYSTEM:

There have been a few developments on gesture language recognition with the usage of computer vision and image processing techniques. The overall purpose of these developments is to provide an alternative method to aid the disabled people in terms of communicating with each other to deliver a message or to depict an emotion without the usage of human voice or emotions. A model of Hand Gesture recognition made use of an Artificial Neural Network in order to train and recognize a static hand gesture and Jiahui Wu had equipped an acceleration-based gesture recognition approach, called FDSVM (Frame-based Descriptor and multi-class SVM), which needs only a wearable 3-dimensional accelerometer from which the gesture is collected and represented in the form of a frame-based descriptor.”

PROPOSED SYSTEM

We are able to detect and train the hand gestures using the mediapipe API. Mediapipe API is an ML pipeline that provides services of palm detection and drawing landmarks on the hand. The API first recognizes the palm in the frame and then draws landmarks in the hand. Following palm detection over the entire image, the hand landmark model in the mediapipe API uses regression to accomplish exact key point localization of 21 3D hand-knuckle coordinates within the detected hand regions, i.e., direct coordinate prediction. Even with partially visible hands and self-occlusions, the model develops a consistent internal hand posture representation. These landmarks are used for the prediction of the name of the gestures. The trained model has an accuracy of 95.7% in comparison to the existing models. This is a real-time prediction, as we change our hand gestures the name appearing in the display also changes. The model continuously predicts the name of each gesture that is found in each of the frames.