ASL Interpreter

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ABSTRACT

Conversing with people having a hearing disability is a major challenge. Deaf and Mute people use hand gesture sign language to communicate, hence normal people face problems in recognizing their language by signs made. Hence there is a need for systems that recognize the different signs and conveys the information to normal people

I. INTRODUCTION

Hand gesture is one of the methods used in sign language for non-verbal communication. It is most commonly used by deaf & dumb people who have hearing or speech problems to communicate among themselves or with normal people.

The idea of the project is to recognize and understand the gestures and signs made and to translate it into readable text thereby making it easier for the people with zero knowledge about sign language to understand it.

The motivation behind undertaking this specific problem is to try and help to reduce the problems and challenges faced by the specially challenged people in their day to day lives.

II. METHODOLOGY

The overall system comprises three parts divided into modules namely Camera Module, Detection Module and Interface Module.

Camera Module →→ Detection Module →→ Interface Module

Camera Module

This module's function is to record user input and transfer it as frames to the detection module for processing. Hand belts, data gloves, and cameras are the most frequently used methods of capturing and identifying input. We use the built-in webcam in our product because it is simpler to handle and use. The deeds must be performed in a ROI for recognition.

Detection Module

This module is in charge of processing images. The output from the camera module is then subjected to several image management techniques, such as colour conversion, noise removal, and thresholding, before being processed. Here, the image is identified, recognised, and translated into user-understandable text.

Interface Module

The output screen for the gesture and its interpretation will be this module. Here, the user can see what the gesture actually means. Additionally, it will make an effort to alert the user about background anomalies that can impair the system's input so they can adjust their laptop or desktop web camera to prevent them. This would result in improved execution.

III. MODELING AND ANALYSIS

Literature Survey on Glove Based Approach

In this approach we attach sensors to mechanical or optical gloves that convert the inflection of fingers into electrical signals for hand posture determination and additional sensor for position of the hand. This approach is in utilization for the hand gesture recognition method using a magnetic field which is attached to the glove. The use of gestures among humans by using sign language, is closely linked to speech and represents an effective way of communication, used even prior to talking. The formality of the set of rules chosen in each case is related to the validity of the performed gestures, which means that a ridiculous situation gesture could be commending speech in an unplanned manner

Literature Survey on Vision Based Approach

A vision-based approach, which is focused on how people explain and interpret information about their environment, has the potential to produce organic and non-contact solutions. It's probably a challenging strategy to put into practice. The user interacts directly with the system while extracting the data required for recognition using their bare hands. It makes use of visual features like colour and texture to gather the data required for gesture analysis.

IV. RESULTS AND DISCUSSION

In this report, an effective real-time vision-based American Sign Language recognition system for hearing-impaired and deaf individuals is established. We have excellent accuracy with our data set. After adding two layers of algorithms, we were able to verify and predict symbols that were more similar to one another. This enhanced our prediction.This enables us to recognise practically any symbols so long as they are displayed correctly, there is no background noise, and the illumination is sufficient.

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V. CONCLUSION

The planned effort will contribute to totally getting rid of the current issue. To capture an input image, just use a webcam. This would usher in a new era of computer-human interaction where no direct physical contact is required. By using gesture commands, the technology makes it simple for anyone to use a computer.

However, this technology does not recognise the user's emotions, which means that it falls short of its intended application.

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