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SIGN LANGUAGE COMMUNICATION USING VARIOUS DOMAIN TECHNOLOGIES

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ABSTRACT

In today's world, there's a growing need for a system that can smoothly translate Sign Language into regular text and voice. Such a system would greatly benefit mute individuals and those who may not know sign language. by this system mute peoples will get confidence of communication at every place. In summary, our research presents an innovative system that can automatically recognize and translate sign language signs in real-time scenarios. By removing barriers and making communication easier, we aim to facilitate interaction between the mute community and the broader public. This system has the potential to improve accessibility and inclusivity in various aspects of daily life.

Keywords: Human Computer Interaction, Internet, Libraries, Machine Learning, Natural Language Processing (NLP), CSV Files.

I. INTRODUCTION

The significance of facilitating perfect sign language communication cannot be understated, as it plays a central role in bridging the communication gap between the mute and other individuals. In recent years, advancements in machine Learning (ML) have sparked renewed interest in using these technologies to increase sign language communication.

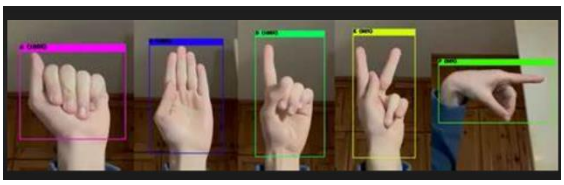
Technologies: Sensor-based recognition:-Sensor-based recognition systems use a camera to capture hand motion recordings through photographs or videos.

1) Computer-Vision technology:- A sensing device captures an image. The sensing device is often just a camera, but could be a video camera, medical imaging device or any other type of device that captures an image for analysis.

2) Machine learning:- Machine learning is a branch of artificial intelligence (AI)and computer science which focuses on the use of data and algorithms to imitate the way that humans learn, gradually improving its accuracy.

Objective:

The goal of the Sign Language Recognition Prototype is to create a real-time system that can understand and interpret Sign Language gestures it aims to identify and choose specific hand features that can be used with machine learning algorithms, making it possible to apply this technology in real-time sign language recognition systems.



System Assumptions:

Distance Range: There is a defined distance range within which the user must stay to fit the limitations of the camera.

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Clear Hand: The system assumes that the user's hand is visible and not blocked by any other objects when making sign language gestures.

Indoor Use: The system is designed for indoor use since the selected camera performs poorly in outdoor sunlight conditions.

Module1: Data Acquisition, Pre-processing, and Feature Extraction

Responsibility: Capturing video input from the camera, processing the video to extract relevant hand gesture information, and identifying specific features from the user's hand.

Purpose: Prepare input data for sign language recognition.

Module 2: Sign Language Gesture Classification:-

Responsibility: Using machine learning algorithms to classify and recognize ASL signs from the extracted features.

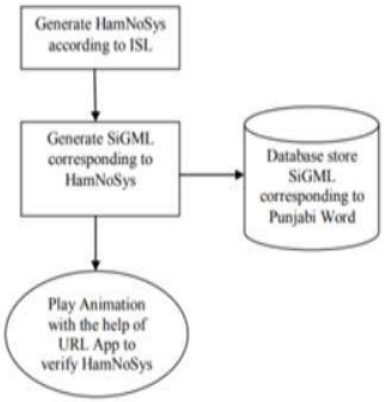
Purpose: Interpret and match hand gestures to corresponding ASL alphabet signs.

II. LITERATURE SURVEY

In the world of gesture recognition and biometrics, most research has focused on glove-based systems. These systems involve wearing special gloves with sensors on each finger, such as potentiometers and accelerometers. These sensors track how your fingers move and use that information to display corresponding letters or gestures from sign language

1. Indian SL Animation generation System:

If we go with the name of this system it is seems like it is created for the Indian Sign Languages (ISL). For thise coversion of engilish words to animation, firstly the HamNoSys based ISL get generated. Then correspondence to Ham NoSys SiGML get generated. Here JA SIGML URL APP is used to check the accuracy of HamNoSys. ISL Dictionary is use to test the accuracy of animated signs.



2. Mute Communication Interpreter:

Here we have two classifications for mute communication methodologies –There are some Wearable Communication methods those are, Glove based system, Keypad method and Handicom Touch-screen. The three previously outlined components employ different types of sensors, including accelerometers, an appropriate microcontroller, a text-to-voice conversion module, a keypad, and a touch sensitive screen. The Online Learning System encompasses diverse approaches. The five specific methods are: SLIM module, TESSA, Wi-See Technology, SWI_PELE System, and Web Sign Technology.

3. Hand Gesture Recognition for Indian Sign Language:

In this methodology employing a database-driven hand gesture recognition system based on a skin color model approach and thresholding method, coupled with an efficient template matching technique suitable for various applications, including human-robotics interactions. Initially, the system segments the hand region using a skin color model within the YCbCr color space.

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4. English to SiGML Conversion for Sign Language Generation:

The proposed system comprises several integral modules: data collection, input module, pre-processing module, HamNoSys conversion module, and finally, the SiGML file conversion module.

5. Offline Signature Verification Using Surf Feature Extraction and Neural Networks Approach:

In this method for offline signature recognition and validation is suggested, employing neural networks. In this approach, signatures are captured and displayed to users in image format. The process involves recording entries and input parameters at specific positions.

6. Offline Signature Verification Using Surf Feature Extraction and Neural Networks Approach:

The fundamental principle behind this system lies in its ability to analyze signature entries and input values at specific positions. This method introduces a significant advancement in signature recognition and verification, combining the power of neural networks with image-based authentication techniques.

7. Sign Language Translation:

Through the utilization of image processing techniques, segmentation is achieved. Sign gestures are captured and processed efficiently utilizing the OpenCV Python library. The classification and prediction tasks are carried out via a convolutional neural network (CNN). While some existing systems rely on datasets of '.jpg' images, the proposed system employs a unique approach by saving the pixel values of each image in a CSV file.

III. CONCLUSION

The survey paper on sign language communication projects underscores the significance of advancing technology to facilitate effective communication for the hard of hearing communities. Sign language, being a vital means of communication for this population, has seen substantial innovation and development in recent years. Through a comprehensive examination of various sign language communication projects, we have observed the progress made in this field.

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