"Sign Language Recognition For Mutism People"

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ABSTRACT

Introduction related your research work Introduction related your research work Introduction related your research work Introduction related your research work Introduction related your research work Introduction related your research work Introduction related your research work Intro Sign Language is the most common mode of communication amongst the deaf and mute people. Many communities don't even try to learn it even though it is the most popular form of communication for a deaf and mute person creating an isolation for physically disabled people. This problem calls for a system which can comprehend physical hand gestures based on static movements and bridge the communication between the normal and disabled. In our project a portable device will be developed for making Gestures. Flex sensors and a Accelerometer will help in communicating with the respective directions in which the person moves his hand to depict the gesture. The parameters measured by the flex sensor and Accelerometer are transmitted as data to the microcontroller. Microcontroller analyzes the data received from the sensors and acts according to the way its programmed to send the respective gesture analysis wirelessly through Bluetooth to an Android Application. The Android Application will be used to speak out the output received from the microcontroller. The same message will also be displayed on a visual screen. By using gestures, our project that will help deaf and mute people to convey their needs to others will be developed.

Keyword : - Artificial intelligence Computer vision Bibliometric analysis Deaf-dumb hearing impaired intelligent systems Scopus database Sign language recognition, VO Sviewer.

1. INTRODUCTION

Communication is an essential tool in human existence. It is a fundamental and effective way of sharing thoughts, feelings and opinions. However, a substantial fraction of the world's population lacks this ability (El-Din & El-Ghany, 2020). Many people are suffering from hearing loss, speaking impairment or both. A partial or complete inability to hear in one or both ears is known as hearing loss. On the other hand, mute is a disability that impairs speaking and makes the affected people unable to speak. If deaf-mute happens during childhood, their language learning ability can be hindered and results in language impairment, also known as hearing mutism. These ailments are part of the most common disabilities worldwide (Hasan et al., 2020). Statistical report of physically challenged children during the past decade reveals an increase in the number of neonates born with a defect of hearing impairment and creates a communication barrier between them and the rest of the world (Krishnaveni et al., 2019). According to the World Health Organization (WHO) report, the number of people affected by hearing disability in 2005 was approximately 278 million worldwide (Savur&Sahin, 2016). Ten (10) years later, this number jumped to 360 million, a roughly 14% increment (Savur&Sahin, 2016). Since then, the number has been increasing exponentially. The latest report of WHO revealed that 466 million people were suffering from hearing loss in 2019, which amount to 5% of the world population with 432 million (or 83%) of them being adults, and 34 million (17%) of them are children (Bin et al., 2019; Hisham&Hamouda, 2019; Saleh&Issa, 2020). The WHO also estimated that the number would double (i.e. 900 million people) by 2050 (El-Din & El-Ghany, 2020). In these fast-growing deaf-mute people, there is a need to break the communication barrier that adversely affects the lives and social relationships of deaf-mute people

1.1 Problem Definition

The current landscape of application creation for students lacks a centralized and user-friendly system that addresses the diverse needs of students in academic and professional pursuits. Existing platforms often fall short in providing comprehensive, customizable, and accessible application templates, leading to various challenges faced by students during the application process. The identified problems include:

Limited Template Variety:
Existing systems offer a limited range of application templates, primarily focusing on resumes and cover letters. Students require templates tailored for diverse purposes, such as scholarships, internships, academic programs, and memberships.

Lack of Customization Options:
Students face challenges in personalizing application templates to showcase their unique experiences and qualifications. Many platforms provide limited customization features, hindering the creation of impactful and tailored applications.

Ineffective Collaboration Features:
Collaboration is a crucial aspect of application refinement. Existing systems often lack features that facilitate effective collaboration between students, peers, mentors, and educators. Feedback mechanisms are limited, hindering iterative improvements.

Usability Issues:
Some platforms have complex interfaces that pose usability challenges for students, particularly those with limited technological proficiency. Intuitive navigation, clear instructions, and user-friendly design are essential but often lacking.

1.2 Proposed System

The proposed system for "Sign Language Recognition for Mutism People" aims to provide an innovative and inclusive solution that empowers individuals with mutism to communicate effectively using sign language. The key features and components of the proposed system include:

Advanced Sign Language Recognition Algorithm:
Develop a state-of-the-art sign language recognition algorithm based on machine learning and computer vision techniques.
Train the algorithm on diverse datasets to ensure accurate recognition of a wide range of sign language gestures.

Multilingual Support:
Incorporate multilingual support to recognize different sign languages used globally.
Allow users to select their preferred sign language from a range of options to ensure inclusivity.

Real-Time Recognition Engine:

Implement a real-time recognition engine that can interpret sign language gestures instantly.
Ensure low latency to facilitate smooth and natural communication between individuals using sign language and those interacting with them.

User-Friendly Interface:
Design an intuitive and user-friendly interface that accommodates individuals with mutism, including those who may have additional cognitive or motor challenges.

Provide visual feedback or prompts to guide users in forming clear and recognizable signs.

Adaptive Learning Mechanism:
Integrate an adaptive learning mechanism that allows the system to adapt to the signing styles of individual users.
Continuously improve recognition accuracy based on user interactions and feedback..

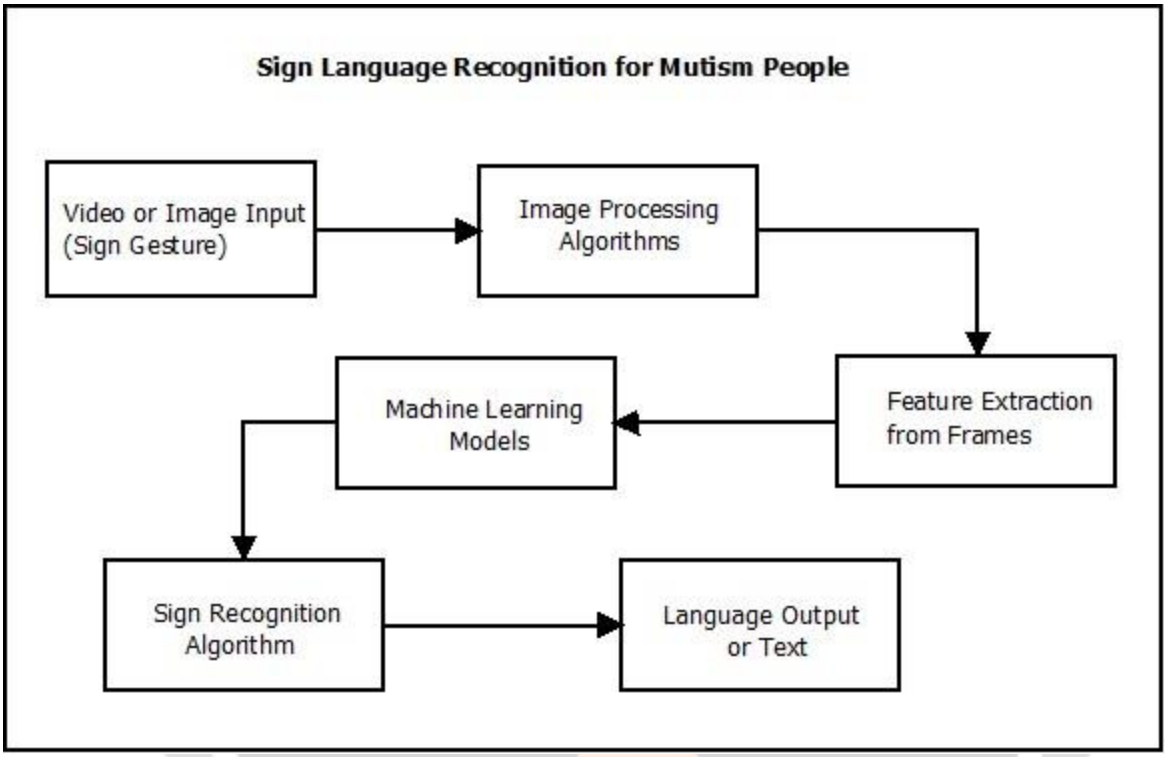
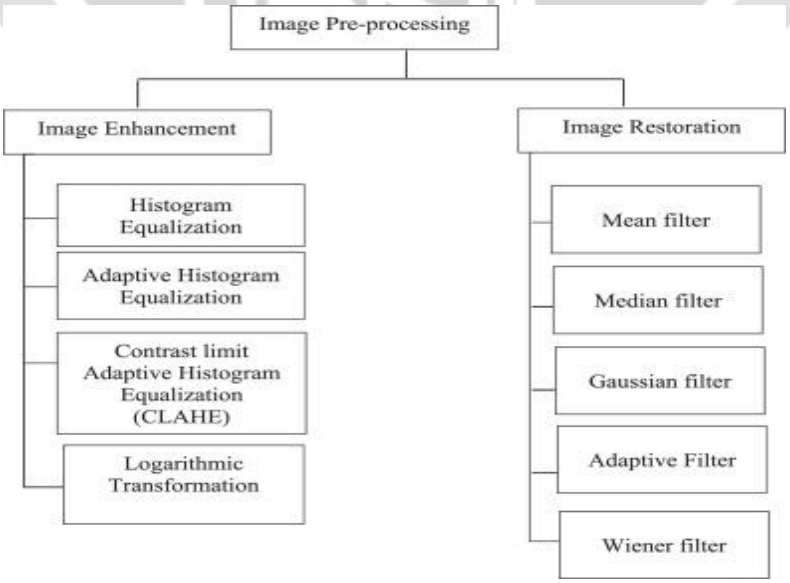


Fig 1.1: Proposed System

2.FLOWCHART



2.1 LITERATURE SURVEY

Paper Title: "IoT Based Sign Language Recognition System"

Abstract: The paper, titled "IoT Based Sign Language Recognition System," was presented at the 2020 2nd International Conference on Advancements in Computing (ICAC) in December 2020. The DOI for this paper is 10.1109/ICAC51239.2020.9357267. The study introduces an innovative approach to sign language recognition by leveraging the Internet of Things (IoT) technology.

Abstract Summary: This paper explores the development and implementation of an IoT-based system for the recognition of sign language gestures. Sign language is a vital mode of communication for individuals with hearing impairments, and technological advancements can significantly enhance its accessibility and usability. The authors present a novel system that integrates IoT devices to capture and interpret sign language gestures in real-time.

The proposed system employs advanced machine learning algorithms and computer vision techniques for accurate gesture recognition. The utilization of IoT devices enhances the portability and ubiquity of the system, allowing users to communicate through sign language in various environments. The paper discusses the architecture, implementation details, and performance evaluation of the IoT-based sign language recognition system.

The research contributes to the growing field of assistive technologies, particularly in enhancing communication accessibility for individuals with hearing impairments. The findings and insights presented in this paper pave the way for further developments in the intersection of IoT and sign language recognition, offering new possibilities for inclusive and technology-driven communication solutions.

2.2 SOFTWARE AND HARDWARE REQUIREMENT

SOFTWAREREQUIREMENTS:

- Operating System: Windows, Linux, or macOS
- Database Management System: MySQL, PostgreSQL, or Oracle
- Programming Languages: Python
- Version Control: Git for managing source cod

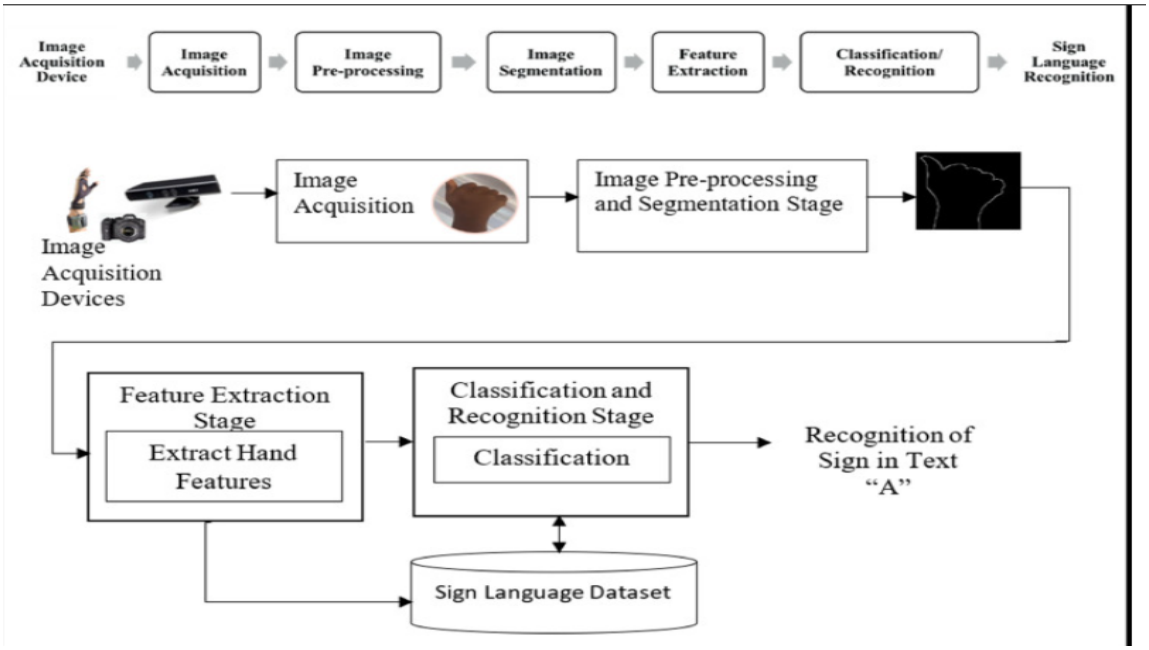
HARDWARE REQUIREMENTS:

- Processor: Modern multi-core processor (Intel Core i5 or equivalent)
- Memory (RAM): Minimum 8 GB RAM (16 GB recommended for larger datasets and complex models)
- Storage: SSD storage for faster data read/write operations
- Camera: High-quality webcam for capturing facial expressions

3. Gantt Chart

Figure2.1:Gantt chart(color figure)

3.1 System Architecture



. **Fig 1 : Block Diagram of Sign Language Recognition for Mutism People**

Working:

The stages involved in vision-based sign language recognition (SLR) can be categorised into five stages: image acquisition, image pre-processing, segmentation, feature extraction, and classification, as shown in above fig Image acquisition is the first stage in sign language recognition that can be acquired through self-created or available public datasets. The second stage is preprocessing to eliminate unwanted noise and enhanced the quality of the image. Next, after preprocessing step is to segment and extract the region of interest from the entire image. The fourth stage is feature extraction, which transforms the input image region into feature vectors for recognition. The last stage in vision-based SLR is classification, which involves matching the features of the new sign image with the stored features in the database for recognition of the given sign .

4. CONCLUSIONS

People who are deaf or hard of hearing typically use sign languages to communicate. Hand gestures are used by Deaf or Mute persons to communicate; as a result, non-Deaf people have a hard time understanding their messages. The main methods for identifying sign gestures include glove-based recognition approaches as well as static and dynamic vision-based techniques. The glove-based method looks a tad uncomfortable to use in real-world conditions, while being over 90% accurate. We suggested a vision-based method for word-level and finger-spelling sign language in this research. A total of maximum sign or images make up the sign dataset, which also includes sign data as a sentences for each sign .

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