REAL TIME SIGN LANGUAGE TRANSLATOR

Introduction:

- Communication between individuals who use sign language and those who do not often requires a human interpreter. However, interpreters may not always be available, and learning sign language is not common among the general population. This creates a significant communication barrier that restricts social interaction, education opportunities, and workplace inclusivity for people with hearing and speech impairments.

- There is a need for an automated, real-time system that can recognize and translate sign language gestures into a format understandable by everyone.

OBJECTIVE :

The main objectives of this project are:

- To design a real-time system capable of capturing hand gestures using a webcam.

- To preprocess and extract hand landmarks using computer vision techniques.

- To classify sign language gestures using machine learning algorithms.

- To display the recognized gestures as text in real time.

- To provide an option for converting recognized gestures into speech for effective communication.

- To create a low-cost, accessible solution that can be extended to mobile or wearable devices in the future.

IMPLEMENTATION

1. Dataset Collection

2.Preprocessing

3. Hand Landmark Detection

4. Model Training

5. Real-Time Gesture Recognition

6. Speech Output Integration

7. User Interface

RESULT

1. Recognition Accuracy

2. Real-Time Performance

3. Output Examples

4. Observations

CONLUSION:

- The Real-Time Sign Language Translator was successfully developed as a prototype system to address the communication barrier between the deaf-mute community and non-signers. By integrating computer vision, machine learning, and speech synthesis, the system was able to recognize hand gestures captured through a webcam and translate them into both text and speech output.

- The implementation using MediaPipe hand landmarks and a trained classification model demonstrated that real-time recognition can be achieved with high efficiency on standard hardware without the need for expensive sensors or data gloves. The project fulfilled its objectives of creating a low-cost, accessible, and user-friendly solution for gesture recognition.

FUTURE ENHANCEMENT

- **Continuous Gesture Recognition**

- **Expanded Vocabulary**

- **Multi-Language Support**

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