

Sign Recognition using Machine Learning

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Abstract: *This paper presents the development and implementation of a Sign Recognition System using Machine Learning techniques aimed at reducing the communication gap between deaf and hearing individuals. The system is designed to translate sign language gestures into text or speech and convert voice input into corresponding sign language representations. By integrating computer vision, image processing, and machine learning algorithms, the proposed system enables real-time gesture recognition and accurate interpretation of hand movements.*

The system utilizes a camera module to capture hand gestures, which are then processed using advanced feature extraction techniques. Machine learning models are trained on gesture datasets to accurately classify and interpret different sign patterns. Additionally, speech recognition modules are incorporated to convert spoken language into sign representations, enabling two-way communication.

This research highlights the importance of assistive technologies in improving accessibility and inclusivity for the deaf and speech-impaired community. The proposed system aims to provide a user-friendly, cost-effective, and efficient solution that enhances communication and social interaction. Challenges such as lighting conditions, camera quality, and gesture variation are also discussed along with possible improvements for future development.

Keywords: Machine Learning (ML), Sign Language Recognition, Image Processing, Computer Vision, Speech Recognition, Gesture Detection, Human-Computer Interaction (HCI)

