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Indian Sign Language Detection using CNN

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Abstract: *Communication barriers often hinder the participation of the deaf community in broader society. Indian Sign Language (ISL) serves as the primary means of communication among its inhabitants. To facilitate communication between the deaf community and regular individuals, technology can be employed to convert sign languages into a comprehensible form. This paper presents a project aimed at developing a system that efficiently converts ISL into text using a deep learning technique. The proposed approach utilizes a convolutional neural network (CNN) implemented with Python-based Keras framework. The classifier model is designed to classify signs based on numerical features. In the second phase, a real-time system is employed to detect the Region of Interest (ROI) within the video frame using skin segmentation and bounding box techniques. The segmented region is then fed into the classifier model to predict the sign being performed. The system achieves an accuracy rate of 99.56% on the given topic and demonstrates 97.26% accuracy even in low light conditions. Furthermore, the classifier model exhibits improvement in performance across diverse backdrops and various picture capture angles. The proposed approach primarily focuses on utilizing an RGB camera system.*

Keywords: Deep Learning, Convolutional Neural Networks, real-time system, Computer Vision, Training, user Interaction, Indian Sign Language

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