

Machine Learning Approaches for Hand Sign Recognition

Shreya Singh¹ and Prof. Sandeep NK²

Department of Master of Computer Applications¹

Assistant Professor, Department of Master of Computer Applications²

Vidya Vikas Institute of Engineering and Technology, Mysore

Abstract: *This paper presents a deep learning-based system for real-time recognition of American Sign Language (ASL) gestures, including alphabets, digits, and common expressions. Using a modular pipeline—data acquisition, OpenCV preprocessing, MediaPipe Hands feature extraction, CNN classification in TensorFlow, and real-time text conversion—the system achieves over 92% accuracy across varied lighting and hand orientations at 30 FPS with a model under 1 MB. This approach addresses the shortage of interpreters and helps bridge communication gaps for the hearing-impaired community.*

Keywords: Sign Language Recognition, Deep Learning, Convolutional Neural Network, Computer Vision, MediaPipe, Real-time Systems, Assistive Technology, American Sign Language

