

AI-Enabled Speech to Sign Language using Avatar

J. John Merina¹, M. Aasha², A. Priyadharshini², K. Varsha²

Assistant Professor, Department of Computer Science and Technology¹

Students, Department of Computer Science and Technology²

Vivekanandha College of Engineering for Women (Autonomous), Tiruchengode, India

johnmerina@vcew.ac.in, aashamurugesan214@gmail.com,

priyadharshinianbuselvam@gmail.com, varshakannan2050@gmail.com

Abstract: *Communication barriers faced by individuals with hearing impairments can significantly impact their daily interactions. This paper presents a Speech-to-Sign Translation and Accessibility System that leverages Artificial Intelligence (AI) and Natural Language Processing (NLP) to convert spoken language into real-time sign language. The system utilizes speech recognition algorithms to capture and process spoken words, which are then translated into sign language gestures displayed via an animated avatar. By integrating machine learning models and a gesture synthesis engine, the system ensures accurate and context-aware translations. Additionally, it offers a user-friendly interface to enhance accessibility for individuals with hearing disabilities. The solution aims to bridge the communication gap, promote inclusivity, and provide a seamless interaction experience for the deaf and hard-of-hearing community in various public and private settings.*

Keywords: Speech-to-sign translation, ASR, NLP, 3D avatar, sign language synthesis