 

# REAL-TIME LANGUAGE TRANSLATION FOR SIGN LANGUAGE

**A PROJECT REPORT**

***Submitted by***

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## BONAFIDE CERTIFICATE

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## ABSTRACT

The "Real-time Language Translation for Sign Language" project aims to bridge the communication gap between hearing-impaired individuals who use sign language and those who communicate through spoken or written language. It combines computer vision and natural language processing to provide real-time translation of sign language gestures into spoken and written forms. Through advanced image and video processing, computer vision captures and interprets sign language gestures using deep learning models such as convolutional neural networks, mapping them to linguistic symbols. Natural language processing techniques then translate these gestures into spoken or written language, facilitated by machine translation models. Data collection, annotation, and model training are vital components of the project, with a comprehensive dataset used for training to ensure low-latency translation. This technology has broad applications, empowering hearing-impaired individuals to communicate with a wider audience and promoting inclusivity in various fields such as education, healthcare, customer service, and public services. In conclusion, the project's fusion of computer vision, NLP, and assistive technology has transformative potential, enhancing the quality of life for the hearing-impaired and fostering inclusivity in society.

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## LIST OF ABBREVIATIONS

**API:** Application Program Interface **CNN:** Convolutional Neural Network **GUI:** Graphical User Interface

**NLP:** Natural Language Processing

**RGB:** Red, Green Blue

**H, W:** Height and Width of the frame

**D:** Depth of the frame

**MP:** Media pipe Library **SVM:** Support Vector Machine **F, G:** Finger number

**X, Y:** Coordinates of hand landmarks

**C:** Number of classes

**DIR:** Directory

**Ret:** Return value.

**Cap:** Video Capture object **CV2:** OpenCV library **Dict:** Dictionary

**Model:** Machine Learning model

**Pred:** Prediction

**LB:** Label Binarize

**LFW:** Label Face Words

**HP:** Haar cascade for face detection

**Path:** File path