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**VISVESVARAYA TECHNOLOGICAL UNIVERSITY,  
BELAGAVI - 590018**



**Mini Project Report**

**On**

**“HAND GESTURE DETECTION”**

A report submitted in partial fulfillment of the requirements for

**MINI PROJECT (21AIMP67)**

**In**

**Artificial Intelligence & Machine Learning**

Submitted by

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Approved by AICTE, New Delhi, Recognized by Government of Karnataka.

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Shobavana Campus, Mijar, Moodbidri, D.K., Karnataka

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CERTIFICATE

This is to certify that the Mini Project entitled **"HAND GESTURE DETECTION"** has been successfully completed by

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The Bonafide students of the Department of Artificial Intelligence and Machine Learning, Alva's Institute of Engineering and Technology in the **DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING** of the VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI during the year 2023–2024. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The Mini Project report has been approved as it satisfies the academic requirements in respect of the Mini Project work prescribed for the Bachelor of Engineering Degree.

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## ABSTRACT

Our project, Hand Gesture Detection for Sign Language Conversion into Text and Audio, is designed to bridge the communication gap for individuals using sign language. By leveraging advanced machine learning techniques and Natural Language Processing (NLP), this system accurately interprets hand gestures and converts them into both text and audio formats. The project employs Convolutional Neural Networks (CNN) for gesture recognition, utilizing OpenCV and Mediapipe for real-time hand tracking and analysis. The integration of the Natural Language Toolkit (NLTK) for tokenizing and tagging inputs, along with the Levenshtein distance algorithm for accurate query matching, ensures high precision in interpretation. Built with Flask, the user-friendly web interface allows seamless interaction, making it accessible for users with varying levels of technical proficiency. This tool aims to enhance communication, providing an essential resource for those relying on sign language for everyday interactions.