

MES COLLEGE OF ENGINEERING-KUTTIPPURAM
DEPARTMENT OF COMPUTER APPLICATIONS
20MCA246 – MAIN PROJECT

PRO FORMA FOR THE APPROVAL OF THE FINAL SEMESTER PROJECT

(Note: All entries of the pro forma of approval should be filled up with appropriate and complete information. Incomplete Pro forma of approval in any respect will be rejected.)

Project Proposal Number : _____
(Filled by the Department)

E-Mail : _____
Mobile No. : _____

Academic Year : 2025_____
Year of Admission : 2023_____
Admission Number : 18095_____
Roll Number : __22_____
Register Number : MES23MCA-2022_____

1. Name of the Student (in BLOCK LETTERS) : JILSINA PARVEEN K V
2. Name of the Organization : _____
3. Address of the Organization : _____
Telephone No. : _____ Company E-Mail : _____
4. Name of the External Guide : _____
Mobile No. : _____ E-Mail : _____
5. Title of the Project : HAND SIGN RECOGNITION SYSTEM
6. Name of the Guide : DR. GEEVAR C. ZACHARIAS
(Internal-Department)

Date :

Signature of the Student:

Comments of The Project Guide

Initial Submission : _____
Approval Status : _____ Approved / Not Approved Dated Signature of Guide HOD
First Review : _____
Second Review : _____
Third Review : _____

Comments of The Project Coordinator

Initial Submission: _____
First Review : _____ Second Review: _____ Third Review: _____

Dated Signature of Project Coordinator:

ABSTRACT
HAND SIGN RECOGNITION SYSTEM
JILSINA PARVEEN K V, MES23MCA-2022, 22

Introduction:

The Hand Sign Recognition System is a cutting-edge application that interprets and recognizes hand gestures to enable natural and intuitive communication between humans and machines. It operates within the domains of computer vision, machine learning, and human-computer interaction (HCI), utilizing advanced image processing techniques and pattern recognition algorithms to identify gestures in real time.

Hand sign recognition has broad applications, including sign language translation, gesture-based control of devices, and accessibility solutions for individuals with disabilities. It eliminates the need for traditional input devices, offering a seamless and touch-free interface for interaction. This is especially valuable in environments like virtual reality, robotics, and smart homes, where conventional input methods may be inconvenient or inefficient.

By leveraging advancements in deep learning, particularly convolutional neural networks (CNNs), hand sign recognition systems are capable of achieving high accuracy in gesture identification. This technology is a step toward creating more inclusive, interactive, and intuitive systems, bridging the gap between human intent and machine response.

Objectives:

- To develop a real-time sign language translation system that converts gestures into spoken and written languages.
- To implement multi-language support for broader accessibility.
- To enhance gesture recognition accuracy using machine learning and natural language processing (NLP).
- To create an intuitive and user-friendly interface for easy accessibility.
- To ensure inclusivity by accommodating different sign language dialects.

Motivation or Relevance:

The motivation for this project stems from the communication challenges faced by the deaf and hard-of-hearing communities in daily interactions, education, and workplaces. Existing solutions, such as interpreters, are not always available or affordable. Some digital tools are limited in vocabulary and lack real-time translation capabilities. By leveraging artificial intelligence, this project aims to provide a cost-effective, scalable, and accurate solution that improves accessibility and inclusivity for sign language users worldwide.

Problem Definition:

Current sign language translation methods face several issues:

1. **Limited real-time translation** – Most existing systems rely on static dictionaries or pre-recorded videos rather than real-time recognition.
2. **Dependency on human interpreters** – Expensive and not always available.
3. **Accuracy challenges** – Difficulty in recognizing complex gestures, dialect variations, and contextual meanings.
4. **Limited language support** – Few existing systems translate sign language into multiple languages.

Basic functionalities:

The project is divided into three main modules:

Admin Module

- Login
- Manage experts
- Manage sign language data
- View complaints and send replies
- View feedback
- Manage camera configurations
- Block/unblock users

Expert Module

- Login
- View and update profile
- Change password
- Chat with users and admin
- Manage video resources and tips
- View feedback

User Module

- Register and login
- Chat with experts
- View and update profile
- Reset password
- Submit complaints and feedback
- Convert sign language into spoken/written languages
- Access video tutorials

Tools / Platform, Hardware and Software Requirements:

Tools / Platform

- **Programming Languages:** Python (Django), Flutter (for mobile)
- **Frontend Technologies:** HTML, CSS, JavaScript
- **Backend Framework:** Django (Python)
- **Database:** MySQL
- **Integrated Development Environment (IDE):** PyCharm

Hardware Requirements

- **Processor:** Intel Core i3 or above
- **Mobile:** Android-supported smartphone

Software Requirements

- **Operating System:** Windows 7 or above
- **Development Tools:** PyCharm

Reference

Computer Vision and Gesture Recognition:

- *Real-Time Hand Gesture Recognition with OpenCV* (Tutorial on hand detection and gesture recognition using OpenCV):
 - Link: <https://www.pyimagesearch.com>