Problem Statement

Integrated Common Services to Common People

Category: Implementation
Participants: 1st-4th Semester Students
Prerequisites: ▪ Basic Programming ▪ Python or Web based Application or Android Programming

Description: Develop a Web based or an Android application for solutions catering to common people focused issues (Health, Education, Transport, Finance Services, etc.) from day-to-day life. Even though a lot of information is available on internet, still people are facing issues in identifying information like:

▪ **Health**: To consult a Doctor, to find Lab Services, Hospitals, Pharmacy, etc.
▪ **Education**: Learning Materials, Online Mentors, Students, Teachers etc.
▪ **Transportation**:Auto, Bike, Car, Bus, Air Services, etc.
▪ **Finance**: Banking, Tax, Insurance, etc.
▪ **Government Services**: Tax, Insurance, etc. Aadhar, Ration Card, Passport, etc
▪ **Housing Services**: Electrician, Plumber, Carpenter, Painter, etc.

Develop one particular GUI Web Application through which all the above details should be available for a common man, who can access this through Mobile Phones. Both Service Users and Service Providers should register and authenticate to avail the Services.

Deliverables: 1. Data Collection 2. Data Preparation 3. Application development 4. Advantages and Disadvantages 5. Tabulate Results

Unique Idea Brief

This project, "Integrated Common Services to Common People," envisions creating a user-friendly platform that streamlines access to essential services in health, education, transportation, finance, and government sectors. By leveraging advanced web and mobile technologies, it aims to address common challenges and make vital information more accessible.

Features Offered

Real-Time Translation:

The application offers real-time translation of sign language gestures into text or spoken language, facilitating seamless communication between sign language users and non-users.

High Accuracy Recognition:

Leveraging advanced machine learning algorithms and computer vision techniques, the interpreter ensures high accuracy in recognizing and interpreting various sign language gestures

User-Friendly Interface:

The application boasts an intuitive and easy-to-navigate interface, making it accessible for users of all ages and technical backgrounds.

Real-Time Feedback:

Provides immediate feedback to users on the accuracy of recognized gestures, helping them refine their sign language communication skills.

Multi-Language Support:

The interpreter supports multiple spoken languages, allowing translations from sign language to various target languages based on user preference.

Process Flow

Initialization: User opens the application and logs in or registers.

Input Capture: User performs sign language gestures in front of the camera. The camera captures the video frames.

Pre-processing: Frames are filtered and prepared for analysis (e.g., background removal, normalization).

Feature Extraction: Key features of the gestures are extracted using computer vision techniques.

Gesture Recognition: Extracted features are processed by a machine learning model.The model classifies the gestures into predefined categories.

Translation: Recognized gestures are mapped to corresponding text or spoken language.

Technologies used

Keras: High-level neural networks API for building and training deep learning models.

HTML: Markup language for structuring web content.

CSS: Stylesheet language for designing web page

Pycaw: Python library for controlling Windows audio mixer.

OpenCV: Library for real-time computer vision and image processing

Scikit-learn: Python library for machine learning and data analysis.

TensorBoard: Visualization tool for monitoring machine learning model training.

Team members and contribution

Team Leader : Shlok S. Jha

Contribution : Integration, Keras establishment & integration

Team members :

Diya Jain : Logo making, Pycaw , Scikit-learn

Sonika Kulkarni : Html & Css , Tensorboard

Jash Doshi : Research and development

Architecture Diagram

User Interface: Login/Register Home Page

Input Module: Capture Gesture: User performs gestures in front of the camera, which captures the video frames.

Processing Module:Feature Extraction Extract key features using computer vision techniques.Gesture Recognition Machine learning model classifies gestures.

Translation Module: Mapping Map recognized gestures to corresponding text. Text-to-Speech Convert text to speech (optional).

Output Module: Display Translation Show translated text on the screen.Audio Output Provide spoken translation (if applicable).

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|          Main Application      |

| +----------------------------+ |

| |        Header (Label)      | |

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| +----------------------------+ |

| |    Button Frame (Frame)    | |
| | +------------------------+ | |
| | | Capture Gesture (Button)| | |
| | +------------------------+ | |
| | +------------------------+ | |
| | | Translate Gesture      | | |
| | | (Button)               | | |
| | +------------------------+ | |
| | +------------------------+ | |
| | | View Translation (Button)| | |
| | +------------------------+ | |
| +----------------------------+ |
| +----------------------------+ |
| |    Video Display (Label)  | |
| +----------------------------+ |
| +----------------------------+ |
| |  Processing Status (Label)|  |
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Conclusion

The sign language interpreter project leverages a combination of advanced technologies including Keras, HTML, CSS, Pycaw, OpenCV, scikit-learn, and TensorBoard. These tools work together to create a robust application that captures gestures, processes them using deep learning, and provides real-time translation. This innovative approach not only enhances communication for the deaf and hard-of-hearing community but also showcases the potential of integrating machine learning with real-world applications. The project is a testament to how technology can bridge gaps and make a meaningful impact.

✨**Thank You**✨