



VI SEMESTER

Two Week Summer Internship Program (PAT Project)

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MENTOR	DESIGNATION	BRANCH
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TITLE

TRANSLATION

Sign Language Detection Using Machine Learning

BASICS

Sign Language Basics

Types of Sign Language and Common Signs

- **American Sign Language (ASL):** Used in the United States and Canada
 - Uses hand shapes, facial expressions, and body language
 - Has its own grammar and syntax
- **British Sign Language (BSL):** Used in the United Kingdom
 - Uses hand shapes, facial expressions, and body language
 - Has its own grammar and syntax
- **Common Signs:** Hello, Thank you, Yes, No, Goodbye



HELLO



GOODBYE



PLEASE



THANK YOU



YES



NO

OBJECTIVE

- Develop a comprehensive dataset of sign language gestures.
- Preprocess the dataset to remove noise and irrelevant features.
- Extract meaningful features using computer vision techniques.
- Train machine learning models for accurate sign language detection.
- Implement a real-time sign language detection system.
- Evaluate the system's performance and accuracy.

PROBLEM STATEMENT

Communication barrier between hearing-impaired and hearing individuals due to the lack of an efficient sign language detection system.

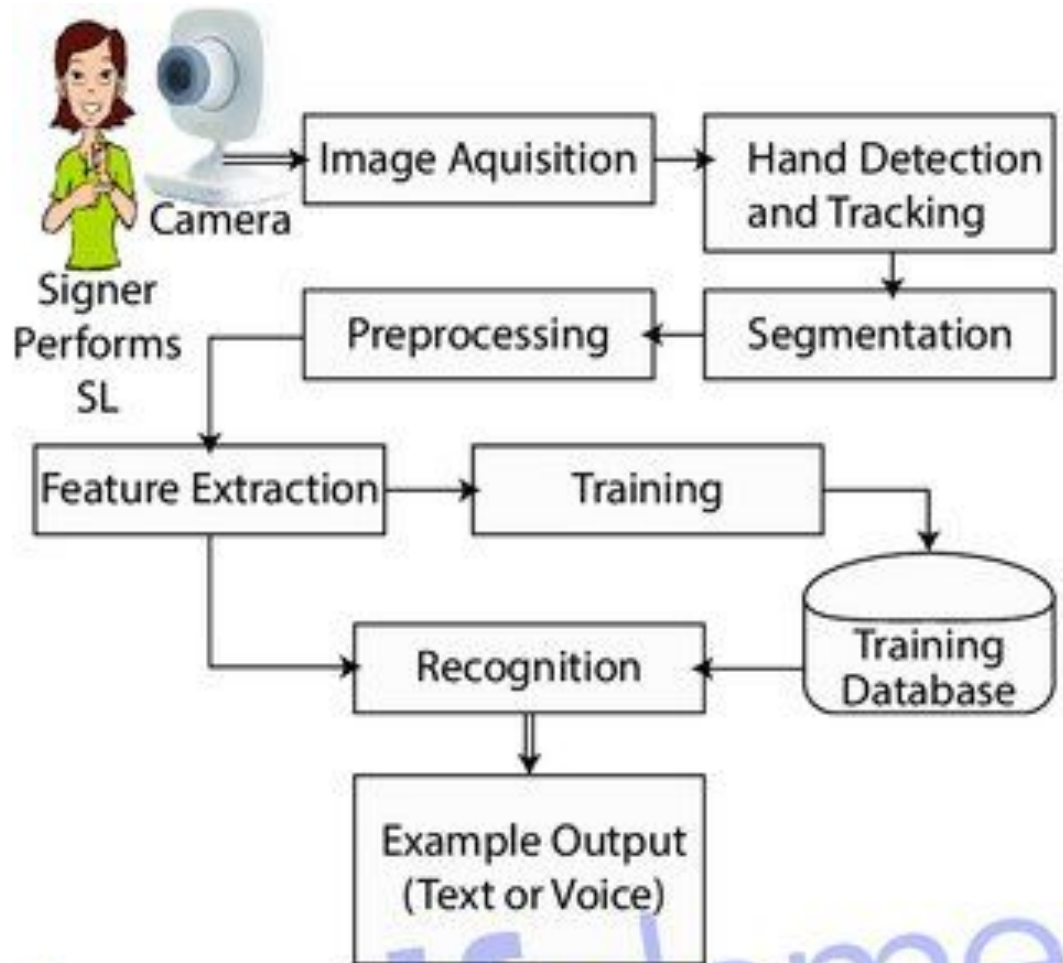
Existing methods for sign language detection are limited in accuracy and real-time capabilities.

EXISTING SYSTEM

- Manual interpretation of sign language by human interpreters.
- Traditional computer vision techniques for gesture recognition.
- Limitations: Dependency on human interpreters, high error rates, and lack of real-time response.

PROPOSED SYSTEM

- Sign language detection system using machine learning algorithms.
- Utilizes computer vision techniques and deep learning models for accurate gesture recognition.
- Real-time response for immediate communication between hearing-impaired and hearing individuals.



Week 1:

Collect a diverse dataset of sign language gestures.

Preprocess the dataset by resizing, normalizing, and segmenting individual gestures.

Extract features using Histogram of Oriented Gradients (HOG) and Convolutional Neural Networks (CNNs).

Week 2:

Train machine learning models (e.g., Support Vector Machines or CNNs) using the preprocessed dataset.

Evaluate the trained models on a separate testing set.

Implement the real-time sign language detection system using the best-performing model.

Test and optimize the system's performance for accuracy and real-time capabilities.

SYSTEM REQUIREMENTS

- hardware requirements :

Processor (CPU)	:	Intel Core i5 (sixth generation or newer) or equivalent
Operating System	:	Microsoft Windows 10 Professional x64
Memory	:	16GB RAM
Storage	:	500 GB internal storage drive
Monitor/Display	:	14" LCD monitor, resolution of 1600 x 900 or better.
Network Adapter	:	802.11ac 2.4/5 GHz wireless adapter

- software requirements :

application server	:	streamlit.io/heroku
front end	:	streamlit/HTML,java,jsp
database	:	mysql/sqlite
python version	:	Python 3.11.0
note	:	The CNN classification model will be developed in Python using Keras and Tensorflow in the backend.

CONCLUSION

- The proposed sign language detection system using machine learning can overcome the communication barrier between hearing-impaired and hearing individuals.
- By leveraging computer vision techniques and deep learning models, accurate and real-time sign language interpretation can be achieved.
- Implementation and evaluation of the system will lead to improved communication and accessibility for the hearing-impaired community.



Thank you