ALL COUNTRY SIGN LANGUAGE RECOGNITION SYSTEM TO HELP DEAF AND MUTE PEOPLE

UNDER THE GUIDANCE OF

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ABSTRACT

This project introduces a revolutionary Sign Language Recognition System designed to empower and enhance communication for individuals who are deaf and mute. By leveraging Cutting-edge technologies, the system aims to bridge the communication gap and improve the quality of life for this community.

INTRODUCTION

Communication is a fundamental aspect of human interaction, and for individuals who are deaf and mute, sign language serves as a crucial medium. This project acknowledges the challenges faced by this community and proposes an innovative solution – All Country Sign Language Recognition System. The goal is to enable seamless communication through the recognition of sign language gestures using advanced technology.

EXISTING SYSTEM

Current methods of communication for the deaf and mute community often rely on traditional Indian sign language interpretation, which may not always be readily available. Manual interpretation is subject to limitations, leading to communication barriers. This project seeks to address these limitations and enhance communication accessibility. In existing system CNN and LSTM algorithms are used.

PROPOSED SYSTEM

The proposed All Country Sign Language Recognition System utilizes **computer vision / image processing** and **machine learning** to recognize and interpret **sign language gestures**. By employing **advanced algorithms** and gesture recognition techniques, the system aims to provide **real-time** and accurate translation of Indian Sign Language into **text** or **speech**. The goal is to create a more inclusive and accessible environment for the deaf and mute community.

ALGORITHM

- **1. Data Collection:**

  Collect a dataset of Indian Sign Language gestures. Ensure that it includes a diverse set of signs with variations in lighting, backgrounds, and hand positions.

- **2. Data Preprocessing:**

  Resize images to a consistent size. Normalize pixels to range (e.g., [0, 1]). Augment data diversity (e.g., rotate, flip, zoom).

- **3. Split Dataset:**

  Divide the dataset into training, validation, and test sets.

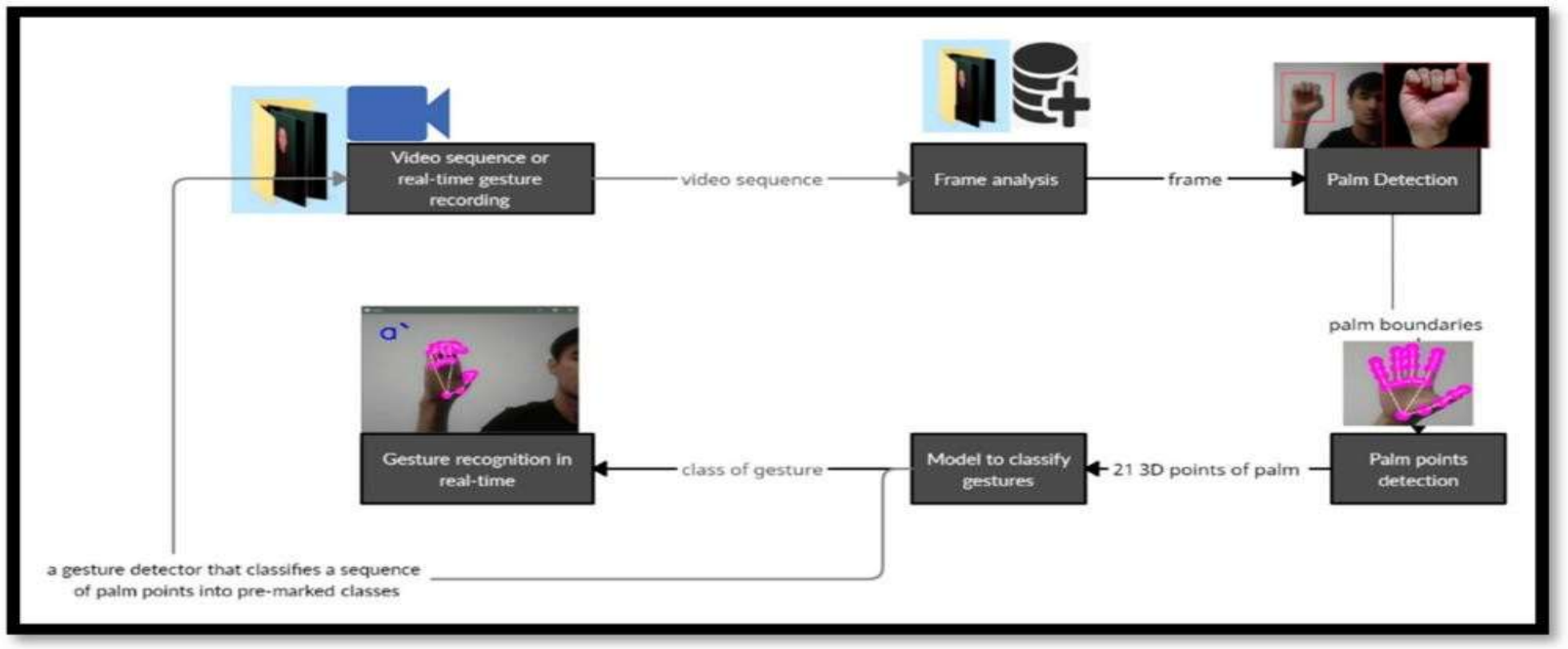
- **4. Model Architecture:**

  Experiment with the number of layers, filter sizes, and neurons in the dense layers based on the complexity of your dataset.

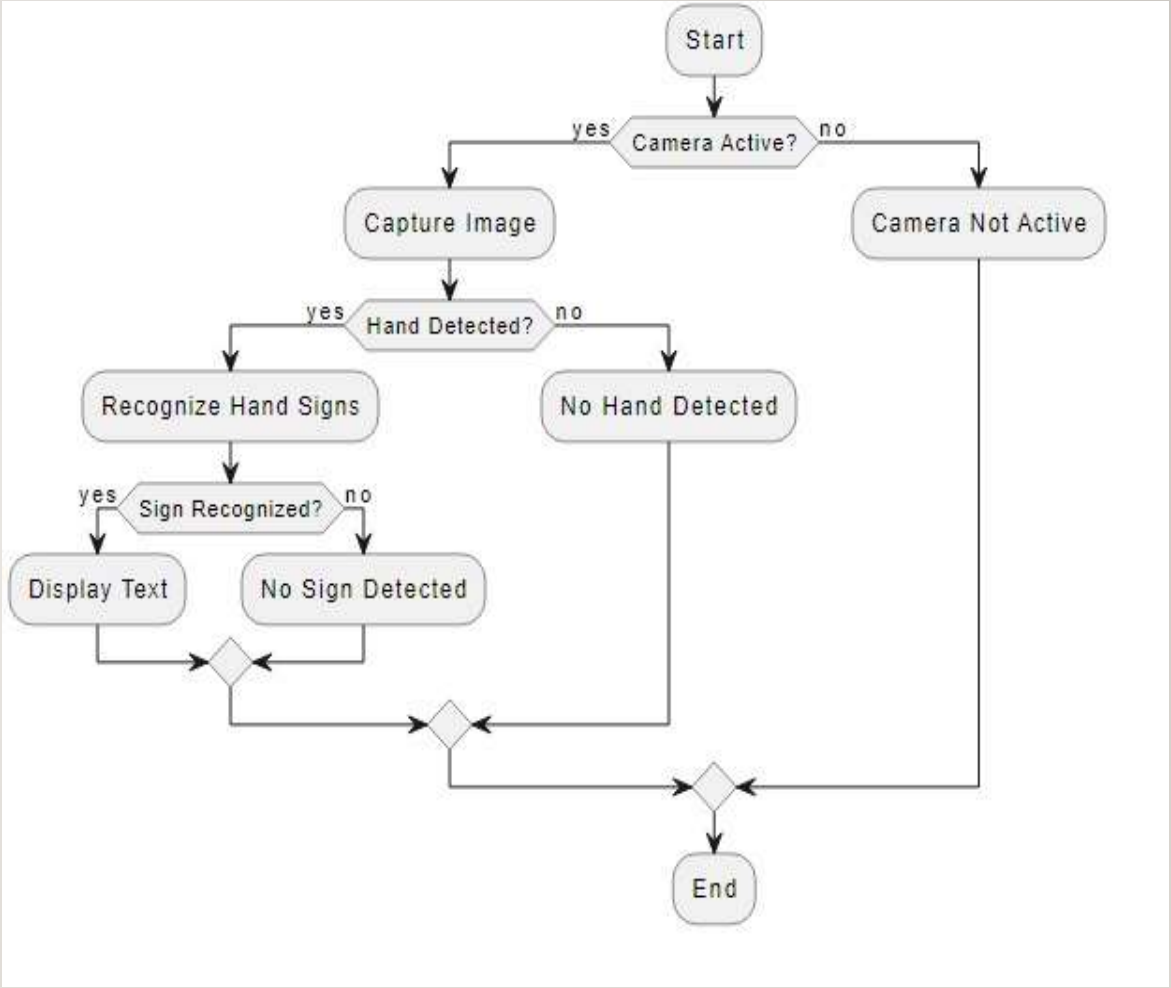
ALGORITHM

- **5. Compile the Model:**
  Choose appropriate loss function (e.g., categorical cross entropy for multi-class classification) and an optimizer (e.g., Adam).
- **6. Model Training:**
  Train the model using the training set. Adjust hyperparameters, such as learning rate, and monitor performance on the validation set to prevent overfitting.
- **7. Evaluation:**
  Evaluate the trained model on the test set using accuracy and other relevant metrics.
- **8. Fine-Tuning:**
  Iteratively fine-tune the model based on evaluation results. Experiment with different architectures and hyperparameters if needed.
- **9. Deployment:**
  Integrate the trained model into your application or platform.

WORK FLOW


Video sequence or real-time gesture recording
video sequence
Frame analysis
frame
Palm Detection
palm boundaries
Palm points detection
21 3D points of palm
Model to classify gestures
class of gesture
Gesture recognition in real-time
a gesture detector that classifies a sequence of palm points into pre-marked classes

FLOW CHART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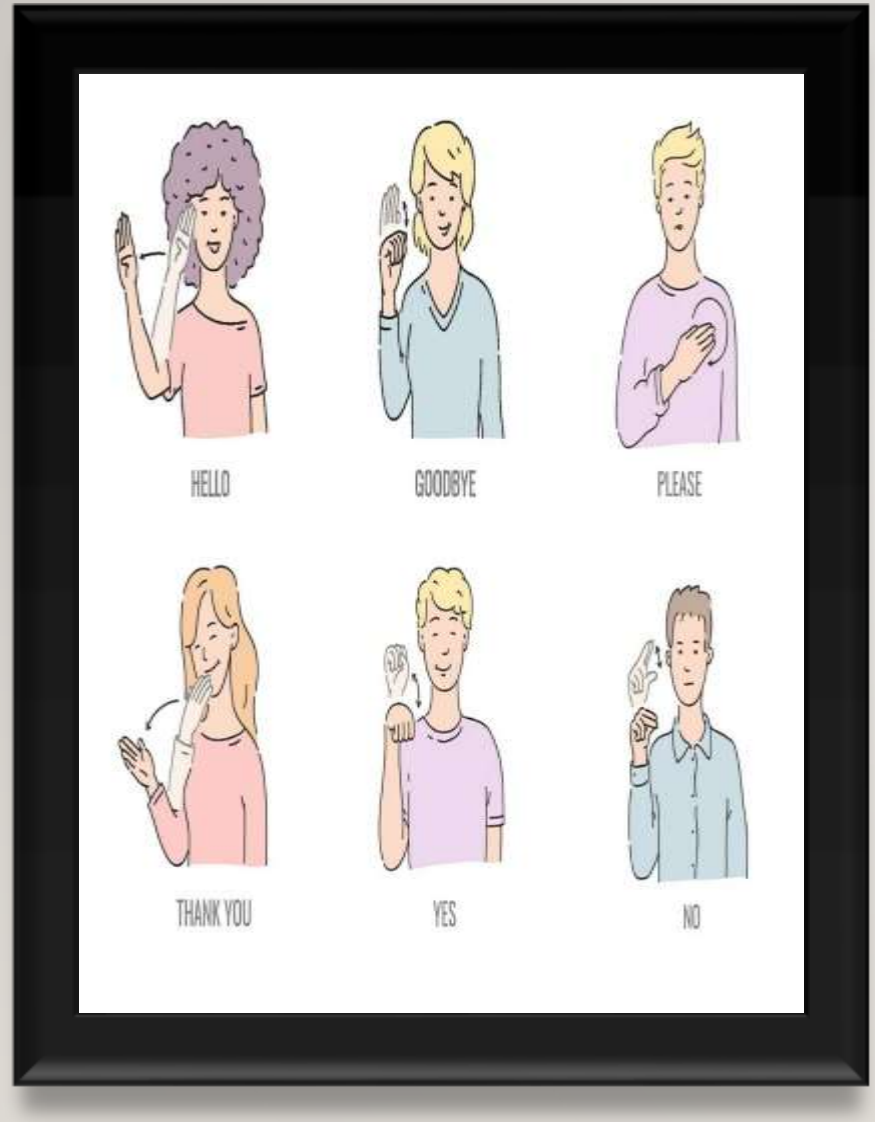
Camera Active?
yes
no
Capture Image
Camera Not Active
Hand Detected?
yes
no
Recognize Hand Signs
No Hand Detected
Sign Recognized?
yes
no
Display Text
No Sign Detected
End



SYMBOLS OF SIGN LANGUAGE

- In this sign language people who are deaf and mute are unable to communicate with their voice so they use different symbols for different alphabets.
- We use these symbols to train the model and the model will convert these symbols into text or speech.

RESULTS


Your Sign: Yes


Your Sign: NO


Your Sign: Hai


Your Sign: Pet


Your Sign: Water

CONCLUSION

In conclusion, the All Country Sign Language Recognition System represents a significant leap forward in providing effective communication tools for the deaf and mute community. By combining computer vision, machine learning, and user-friendly interfaces, this project aims to contribute to a more inclusive society, fostering improved communication and understanding.

THANK YOU