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| **REGISTRATION NUMBER:** | 21501A0556 |
| **PROJECT TITLE:** | ActionLink |
| **TECHNOLOGIES:** | Machine Learning,TensorFlow,Opencv,Python,  MediaPipe,Flask(Frontend) |

**ABSTRACT**

This project focuses on improving communication accessibility for individuals with hearing impairments by leveraging Long Short-Term Memory (LSTM) deep learning models for sign language detection. LSTM networks excel at understanding the sequential nature of sign language gestures, making them an ideal choice for this task.

LSTM models are adept at processing sequential data such as speech recognition, language translation, and sign language detection due to their memory-preserving loops. Once trained and evaluated, they can be deployed for real-time sign language detection, extracting features and predicting gestures as they occur.

The project methodology progresses through the following steps:

1. Essential dependencies are imported and installed to kickstart the project.
2. Hand movements are extracted using the MP Holistic framework to identify key points.
3. Key point values representing various gestures are isolated from the data.
4. A structured folder system is established to ensure organized data collection.
5. Key point values are amassed for both the training and testing phases of the project.
6. Data preprocessing begins, creating labels and features to prepare for analysis.
7. The prepared data is used to construct and train an LSTM neural network, which specializes in processing sequential data.
8. Trained model generates accurate predictions for sign language gestures.
9. Model weights are saved for future reference and utilization.
10. Evaluation metrics, such as confusion matrices and accuracy measures, are employed to gauge the performance of the model.
11. Real-time testing scenarios validate the model's efficacy in practical settings.

Overall, This methodology promises improved communication accessibility for the hearing-impaired through robust sign language detection and action detection systems.

Signature of the Student