

HAND GESTURE INTERACTION SYSTEM WITH KERAS AND OPEN CV

Shaik Anjimoon

Assistant professor, Dept. of Computer Science and Information Technology
Institute of Aeronautical Engineering, Hyderabad, Telangana

Venkata Varun Kumar Velishetty, Nikhil Chigullapally, Vijay Ram Nakka
Dept. of Computer Science and Information Technology
Institute of Aeronautical Engineering, Hyderabad, Telangana

This project shows a new Hand Gesture Interaction System that uses computer vision and deep learning to correctly spot and translate hand gestures into text. It was built with Python in the PyCharm IDE and uses Keras and TensorFlow to build neural networks for Sign Language Recognition (SLR). The system uses OpenCV to take and process images of hands in real time, making it reliable in a range of lighting and background situations. To make a complete dataset, live pictures are gathered using OpenCV. For each gesture, about 100 images are saved in its own folder. Accumulated weighted averaging gets rid of the background, which improves the accuracy of gesture recognition. The model architecture uses Convolutional Neural Networks (CNNs), and the Adam optimization method is used to get the best training results. This technique changes learning rates to account for changes in parameters. This method improves speed and convergence, which is especially helpful for datasets that are noisy or change over time. TensorFlow and Keras are used to build neural networks during the training process, and OpenCV is used to recognize sign language in real time during testing. Techniques for adding to and normalizing datasets make models more resilient, and hyperparameter tuning improves performance even more. Reactive interactions make sure that feedback is given in real time, showing how deep learning and computer vision can change the way people and computers communicate.