

Project Abstract

This project develops an assistive technology system that enables gesture-based communication, integrating a hand gesture recognition module with a robotic arm. The recognition system employs computer vision techniques, including MediaPipe for hand landmark detection and a machine learning classifier for real-time gesture classification. Recognized letters are displayed on an LCD screen, providing immediate feedback to the user. In addition, a robotic arm, controlled by an Arduino Uno, mimics sign language gestures through keyboard inputs. The robotic arm uses servo motors to simulate finger and forearm movements, with an additional LCD screen for character display. This design allows for controlled testing and demonstration of sign language gestures, making the system useful for various applications in accessibility, education, and physical therapy. The decoupled approach ensures easy adaptation for further experimentation and testing, particularly in environments requiring hands-on interaction with assistive technologies.