Microprocessor and Computer Architecture Mini-Project

TITLE : Hand Gesture Controlled Game Using Arduino

Project By :

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Abstract:

The proposed system consists of two main components: the hardware setup based on Arduino and the software model developed in Python. The hardware setup includes an Arduino board connected to sensors such as flex sensors, accelerometers, or gyroscopes, which capture hand movements and gestures. These sensors provide real-time data about the position and orientation of the hand.

On the software side, a Python-based gesture recognition model processes the data received from the Arduino board. The model employs machine learning algorithms, such as Convolutional Neural Networks (CNNs) or Support Vector Machines (SVMs), to classify the hand gestures based on the sensor data. The model is trained on a dataset containing labeled hand gesture samples to accurately recognize different gestures.

Once a gesture is recognized by the Python model, corresponding commands are sent to the computer to perform various tasks, such as controlling the cursor movement, clicking, scrolling, or executing specific applications or commands.

The integration of Arduino and Python enables a seamless interaction between hardware and software components, facilitating real-time gesture recognition and computer control. Moreover, the proposed system offers flexibility in terms of the types of gestures recognized and the actions performed, allowing customization according to user preferences or specific application requirements.

Design Requirements and Specifications:

Hardware Requirements

- Arduino UNO
- Ultrasonic Sensor (HC-SR04)
- Connecting Wires

Software Requirements

- Arduino IDE

Python IDLE