

Arduino-Based Gesture-Controlled Robot

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Abstract: *A robot is an electromechanical system that functions through programmed software. It can operate independently or with human intervention. Autonomous robots analyze their surroundings and make decisions without external control, making them ideal for industrial applications that demand high precision and efficiency. On the other hand, semi-autonomous robots require human input for certain functions. Gesture-controlled robots fall into this category, as they respond to hand movements. This project utilizes an MPU6050 sensor, which integrates a 3-axis accelerometer and a 3-axis gyroscope, along with an Arduino Nano to control the robot. The system employs wireless communication via an RF transmitter-receiver module, allowing hand movements to dictate the robot's motion. Additionally, specific switches are used to operate a pick-and-place servo mechanism. Robots are increasingly revolutionizing industries such as healthcare, defense, construction, and manufacturing. A gesture-controlled system eliminates the need for traditional controllers like joysticks or buttons, enabling users to operate the robot seamlessly using hand gestures. The transmitter, which is held in hand, contains an RF transmitter and an accelerometer that send movement commands to the robot, allowing it to move in different directions or remain stationary.*

Keywords: Robot, Hand Gestures, MPU6050, Arduino, wireless communication