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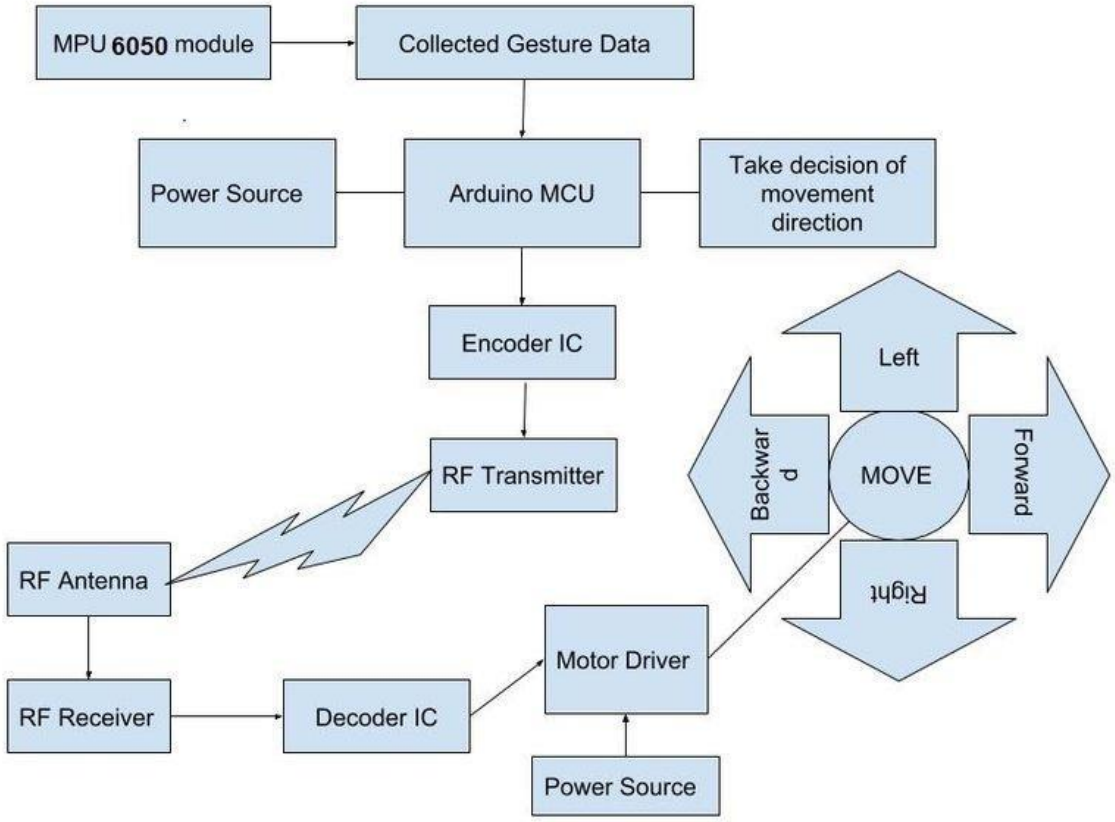
Project Title :Title: Gesture-Controlled Robot: A Hands-Free Approach to Robot Navigation

Abstract:

In today's era of human-computer interaction, the development of intuitive control mechanisms for robots is paramount. This project proposes a novel Gesture-Controlled Robot system that allows users to interact with robots using hand gestures, providing a hands-free and intuitive control interface. The system comprises three main components: gesture recognition module, robot control module, and communication interface. The gesture recognition module utilizes sensors such as accelerometers, gyroscopes, and/or cameras to capture hand gestures in real-time. These gestures are then processed using machine learning algorithms to classify and interpret user commands accurately. Upon recognition of a gesture command, the robot control module translates the detected gesture into appropriate motor commands, enabling the robot to perform desired actions such as moving forward, backward, turning, or stopping. The control module ensures smooth and responsive robot navigation based on the user's gestures. Furthermore, a robust communication interface facilitates seamless interaction between the gesture recognition module and the robot control module, ensuring low latency and reliable transmission of gesture commands. The proposed Gesture-Controlled Robot system offers several advantages over traditional manual or remote control methods. It provides a hands-free control interface, allowing users to operate the robot without physical input devices. Additionally, the intuitive nature of gesture control enhances user experience and facilitates natural interaction with the robot. To validate the effectiveness of the system, experiments will be conducted to assess gesture recognition accuracy, responsiveness of robot control, and user satisfaction. Real-world scenarios, such as navigating through obstacles or performing tasks in unstructured environments, will be simulated to evaluate the system's performance and practicality. Overall, the Gesture-Controlled Robot project aims to revolutionize robot control paradigms by offering a user-friendly, intuitive, and hands-free approach to robot navigation, with potential applications in various domains including home automation, healthcare, entertainment, and beyond.

Block diagram :


MPU 6050 module
Collected Gesture Data
Power Source
Arduino MCU
Take decision of movement direction
Encoder IC
RF Transmitter
RF Antenna
RF Receiver
Decoder IC
Motor Driver
Power Source
Left
Backward
MOVE
Forward
Right