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A Project on

Design and Development of IoT based Robotic Arm by using Arduino

Abstract Submission by

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Abstract

In the rapidly advancing field of medical technology, robotics and automation are revolutionizing surgical procedures. This paper explores the development of a robotic arm designed using Arduino and Potentiometer technology, specifically tailored for surgical applications. The robotic arm, capable of precise multi-directional movement through servo motors, is controlled by an Arduino UNO board that converts analog signals into digital commands for accurate manipulation. The focus of this project is not only on the technical construction of the robotic arm but also on its application in minimally invasive surgeries, where precision and control are paramount.Several types of robotic arms have already been integrated into the medical field, such as the Da Vinci Surgical System, which allows surgeons to perform complex procedures with greater accuracy and control, and Mako Robotic-Arm Assisted Surgery, which is used for orthopedic procedures, offering personalized joint replacement surgeries. Additionally, ROSA and MAZOR robotics systems are used for neurosurgery and spinal procedures, respectively, providing enhanced precision in navigating complex anatomical structures.This project builds on these advancements by exploring a more accessible and customizable approach to robotic surgery. By utilizing Arduino and Potentiometer technology, this robotic arm aims to offer a cost-effective alternative to the high-end surgical robots currently in use. The integration of this technology could democratize access to advanced surgical tools, particularly in resource-limited settings.The robotic arm developed in this project holds significant potential as a surgical tool, enabling surgeons to perform delicate operations with enhanced precision and reduced fatigue. By mimicking the fine motor skills of a human hand, this technology offers improved accuracy and efficiency in procedures such as laparoscopic surgery. This project represents a crucial step toward the future of medical automation, contributing to the evolution of robotic-assisted surgery and enhancing the capabilities of healthcare professionals, particularly in environments where access to high-cost robotic systems is limited.

Keywords:

Robotic Arm, Potentiometric, Servo Motor, Degrees Of Freedom, Programming Language, Translational Motion, Rotational Motion, Hand Gestures, Machine Tool, Gesture Recognition, Parallel Use, Human Arm, Plastic Pieces, Spot Welding.