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Robotic Arm Using Flex Sensors

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Abstract: *The robotic arm is an essential component of robotics research and industrial automation. This abstract provides an overview of a robotic arm project, highlighting its objectives, methodology, and key findings. The primary objective of this project was to design and develop a versatile robotic arm capable of performing various tasks with precision and efficiency. The project aimed to address the challenges associated with manipulation, dexterity, and control in order to create a highly functional robotic arm system. The methodology involved a systematic approach encompassing mechanical design, sensor integration, control algorithms, and software development. The robotic arm was designed using lightweight and durable materials, allowing for ease of movement while maintaining structural integrity. Various sensors, such as force/torque sensors and vision systems, were integrated into the arm to enable perception and feedback for accurate and adaptive manipulation. In terms of control, a combination of kinematic and dynamic control algorithms was employed to ensure precise and coordinated movements of the robotic arm. Advanced control strategies, including inverse kinematics, trajectory planning, and feedback control, were implemented to achieve accurate positioning and trajectory tracking. Throughout the project, extensive testing and evaluation were conducted to assess the performance and capabilities of the robotic arm. Various experiments were performed to evaluate its dexterity, accuracy, payload capacity, and robustness. Real-world scenarios, such as object manipulation, assembly tasks, and pick-and-place operations, were simulated and executed to validate the effectiveness of the robotic arm. The key findings of this project demonstrate the successful design and implementation of a highly functional robotic arm.*

Keywords: Robotic arm, manipulation, dexterity, control, automation.

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