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MATHEMATICAL MODELING AND DESIGN OF A 6-DEGREE OF FREEDOM ROBOT ARM FOR
MICROGRAVITY APPLICATIONS.

Abstract

This paper explores the integration of microgravity effects into the mathematical model of a six-degree-of-freedom robot arm designed for applications in space environments. As robot engineers students, it's important to develop accurate mathematical models considering both dynamic and static forces, including gravity. The focus here is on incorporating the influence of microgravity throughout the entire mathematical equation, from inverse to forward kinematics. By doing so, the paper aims to provide insights into how microgravity affects the behavior and performance of the robot arm. Furthermore, the study will present a real prototype of the robot arm during the International Aerospace Conference, offering practical implications of the developed mathematical model in real-world scenarios.