

Kinematics of Robot Arm using ROS2

Abstract

Robotic manipulators and other automated mechanisms to perform tasks in environments where human access is difficult or unsafe. Accurate operation of these robots requires a good understanding of robot kinematics, which describes how joint movements determine the position and orientation of the robot's end effector.

Robot Operating System 2 (ROS 2) is a widely used open-source robotics framework that provides tools for robot modeling, visualization, simulation, and motion planning. It enables users to design and test robotic systems in a virtual environment before implementing them on real hardware. This project aims to study the kinematics of a robotic arm using ROS 2, model a robot using URDF, visualize it in RViz, implement forward, inverse kinematics and MoveIt 2 to perform inverse kinematics and basic motion planning.

The project will help students understand the fundamentals of robot kinematics and gain hands-on experience with ROS 2, providing a strong foundation for robotics and remote handling applications.

Academic Project Requirements:

1) Required No. of student(s) for academic project: 1

2) Name of course with branch/discipline: B.E./B.Tech. Electronics and Instrumentation Engineering

3) Academic Project duration:

(a) Total academic project duration: 24 Weeks

(b) Student's presence at IPR for academic project work: 4 Full working Days per week

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