



This is a 3-2-1 teaching tool for the introductory robotics course that can effectively show the relationship between the students and the robots. It is a Computer-Based, Active, Problem-Solving instructional scaffold that captures the students interests and facilitates deep learning. This is a storybook of a robot laboratory, which talks about the basics and theory involved in building and programming robots. The book gives the reader an introduction to robotics and introduces new topics, enabling them to design, implement, and program a robot. Robotics is an area that deals with the mathematical modeling and control of small robots or manipulators. The standard method for describing the position and orientation of a robot is the homogenous transformation matrix. This matrix is used to represent the relationship between two coordinate frames and is the basis for constructing the kinematics model of a robot. In this project a new software tool has been designed to aid the teaching of robotics concepts. The tool is termed as RoboAnalyzer. The program is built on a Java-based GUI. The program is implemented using the two dimensional space defined by the axis of the robot arm. Also, a graphical representation is used to visualize the robot's position. The program is initiated by selecting the frame of reference of a robot and an image of the robot in that coordinate system. This is followed by aligning the view with the image on the screen. The position of each arm of the robot in the image and on the GUI is identified by a line connecting the point of the robot's end-effector with the mouse pointer. Also, various other useful features are present which help in effective understanding of the homogenous transformation matrix of a robot.

Introduction To Robotics S K Saha Pdf

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