Software Development for an Inverse Kinematics of Seven-Degrees of Freedom Newly Designed Articulated Inspection Robot

Abstract

Now-a-days robots have occupied a space for themselves in our daily routine life. Modern robots are proficient to execute the complex tasks from like Space Exploration, Nuclear Inspection, Manufacturing, etc to the simple tasks like pick and place. The robots are developed to execute their specified task in the 3-D space. The end-effector of the robot is designed in such a way that it follows the desired trajectory within its working environment. For the accurate functioning of the robot the control over each links and joints is to be ensured. The position and orientation of the end-effector should be precisely controlled to obtain the smooth functioning of the robot. The stable mathematical model is required to indicate the end effector motion and joint-link motions. This type of mathematical model is known as Kinematic Model. It defines the complete spatial position and orientation of the joint-links, end-effector. It involves the mechanics of the motion without considering the forces that causes the motion. In reality inverse kinematic equations are more important which allows the robot controller to move the robot to the desired position and orientation. This paper presents an enhanced analytical approach of inverse kinematics using Denavit-Hartenberg (D-H) parameters. Software named Robot Kinematics is developed in VB6 Platform for better understanding of inverse kinematics and quick manipulations of required angles.
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