

Abdel Rahman T. M, "Microcomputer Aided Selection Of Robot Manipulators", Engineering Journal of Qatar University, 1991, Vol. 4, Pages 141-156.

Abstract

This paper presents two programs for microcomputer aided assessment of the performance of robot manipulators. The first program automatically generates robot models based on user-supplied kinematic parameters. The program also derives a kinematic model that relates the motion of manipulator end-effector to the motion of the joints using the inverse kinematic approach. The approach uses a robust inversion technique that can handle singular conditions as well as joint redundancy. A user can optionally select evaluation of kinematic capabilities of the robot manipulator, such as the ability of the end-effector to reach a specified position and orientation in space or the evaluation of the work space. The second program generates dynamic variables, such as forces and torques, based on user-supplied dynamic parameters and equations of motion of the various joints. Both programs are written for implementation on personal computers. Several runs were carried out to demonstrate the capability and execution times of the two programs