Abstract

The improvements in robot controllers and the increase in robot applications, requiring high precision movements, rise the necessity of evaluating the robot performances in such tasks. Further more it is important to the manufacturer and to the end user to have a testing system able to characterize the robot performance for development purposes or verification of specifications prior to installation or even for maintenance purposes.

This thesis presents a developed testing system capable of determining the path dynamic characteristics, both in terms of position and orientation of the robot end effector. A description of the system concept, mechanical and electronic design and system software are also presented.

A linear path following test is carried out using a Unimate Puma six axis robot, considering different conditions of load and velocity. The position and orientation repeatability are calculated and an analyse of results presented.

A maximum path position repeatability was found to be 0.57 mm and a worst path orientation repeatability 0.97 degrees. The position and orientation repeatability was found to have the same trend with the robot velocity independently of the load. The worst path repeatability results were found to be with the smallest robot load.