Modeling and control of an industrial robot

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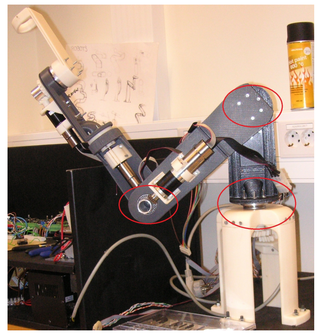
Introduction

This is a result of the CDIO project course TSRT10. A model and a control system has been developed for an industrial robot. The robot that has been used in the project is a result of an earlier project at IEI, Linköping University. The project works in collaboration with ABB Robotics in Västerås and ISY at Linköping University.

Hardware

Each robot motor is connected to a servo amplifier card. The servo amplifier cards are then connected to National Instruments module 9514 which in turn is connected to the computer. The robot has 3 degrees of freedom and a range of approximatley 1 meter in all directions.



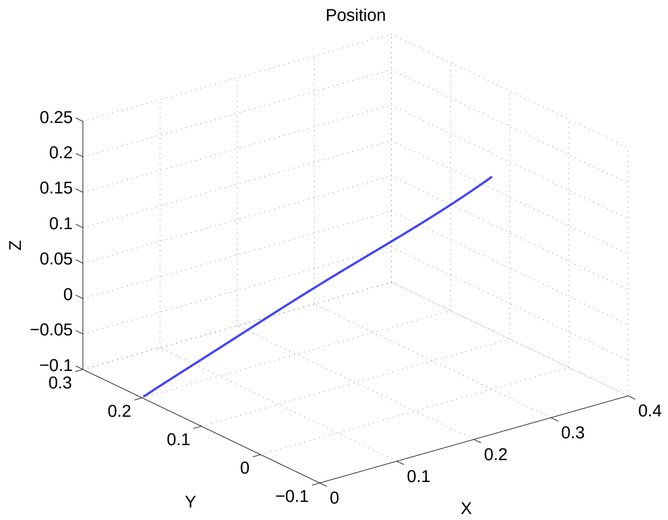
Goals

There are two main goals for this project

- The robot shall be able to move from one set of joint angles to another.
- The robot shall be able to move from one point to another in a straight line.

Simulation

In the simulation model you can simulate a robot movement from one set of angels to another or in a straight line from point A to point B.



Labview GUI

The control system consist of a Labview GUI that is used to control the actual robot in the same way as the simulation model.

Trajectory planner

The trajectory planner calculates the reference angles along the path from point A to point B making the tool move in a straight line.