

Class Project

EGME424 Robotics

Assigned: January 25, 2007



Task 1: Move a ring along a cable (Due on Feb 8, 2 weeks)

I will setup a cable arbitrarily. You must control the robot to move a ring in its gripper along the cable without touching it.

In order to accomplish the task, you must:

1. Derive forward and inverse kinematics for the servo robot. You must define the proper coordinate frames and DH-parameters according to the real dimensions. (Feb 1)
2. Write a Matlab program to control the robot in Cartesian coordinates. You must write the graphic user interface to control the robot motion. (Feb 1)
3. Write a Matlab program to control the robot to move in a straight line. Your program must be capable of saving start and end positions. Then the program will use the start and end positions to generate robot trajectory. (Feb 8)

Task 2: Pick and place objects into the right bins (Due on Feb 15, 1 week)

In this task, you will have a hand on experience with a machine vision. A camera installed above the robot workspace will take a snapshot of objects on the floor. The robot must be able to identify two types of objects, which are different in shape, by using image processing techniques. Then the robot must be able to pick the objects and place them into the right bins.

In order to accomplish the task, you must:

1. Identify and locate (both position and orientation) the object on the floor. (Feb 15)
2. Control the robot to pick up the object, and place it on the bins at the programmed position. (Feb 15)