Robotic Manipulators Project: Step #1

ECE 9053A "Robot Manipulators"

Fall 2024

Objective

The purpose of this assignment is to create an application for a robotic manipulator and justify the type of robot selected, as well as its size. Note that this is a very open-ended problem, but you will be working with the same problem and the same manipulator during all 4 steps of the project.

Instructions

1. **Cover page.** List project title and student name. **Recommended length:** 1 page

2. **Application Description.** Determine an application in which a robotic manipulator can be used. Describe the application and the benefits of using a robot. **Recommended length:** 1/2 to 1 page including drawings if applicable

3. **Environment Description.** Create a 3D environment in which the manipulator will be operating. Determine its dimensions and identify the presence of at least 3 obstacles within the working space of the manipulator. Describe the size of the workspace, the shape and location of your obstacles. The obstacles need to be large enough so that the end-effector must move around them to complete the task. **Recommended length:** 1 to 2 pages

4. **Identification of Robotic Manipulator.** Identify the type of robot that will complete the task. Please do not select the Cartesian manipulator (subsequent assignments will be too simple, and marks will be lost). Assign appropriate link lengths to your robot so that the end-effector can effectively reach all points in the workspace. Describe the end of arm tooling needed to complete the task. **Recommended length:** 1 to 2 pages

Evaluation

- Marks will be assigned on the basis of originality, correctness of solution, thoroughness and clarity of presentation.
- The evaluation of this report will follow the weights in the rubric below and the marking scheme posted separately.

Rubric .	**Weight**
Application	30%
Environment	30%
Robotic manipulator	30%
Presentation	10%
Total	100%

Warnings

Scholastic offences are taken seriously, and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: http://www.uwo.ca/univsec/handbook/appeals/scholastic_discipline_grad.pdf. This report will be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (http://www.turnitin.com).

You must write your report in your own words. Whenever students take an idea, image, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Please note that this includes software code. University policy states that cheating, including plagiarism, is a scholastic offence. The commission of a scholastic offence is attended by academic penalties, which might include expulsion from the program. If you are caught cheating, there will be no second warning.

Reports

Project reports are due on **October 21st, 2024, 11:59pm**, and should be submitted electronically through OWL (section "Assignments"). Reports are to be completed individually. No group work is allowed.