MTRN4230 Lab 04

1. Aim

The aim of this lab session is to understand how to apply the Denavit Hartenberg Convention to calculate the forward kinematics of a robotic manipulator. You will be using Peter Corke's Robotic Toolbox to create serial link manipulators and calculate forward kinematics using its inbuilt function.

2. Pre-lab

Pre-lab checklist:

- Watch Lecture 4 to understand DH convention and forward kinematics concepts.
  - Useful Youtube Video:
    https://www.youtube.com/watch?v=rA9tm0gTln8&ab_channel=TekkotsuRobotics
- Come to the lab prepared with your ROBOT-2 code almost completed. This will be the final week to test your code before the in-lab demonstration in week 5.

3. Lab Activities

During the lab, your demonstrator will go through a tutorial on how to create a few different types of serial link manipulators (robotic arms) with the RVC Toolbox. They will then show a manual calculation example on how to calculate the forward kinematics followed by using the inbuild function provided by the RVC Toolbox. The remaining time will be spent practising your submission for ROBOT-2.

Lab Work Tasks:

1. Follow the demonstrator's tutorial on how to construct different serial link manipulators.
2. Fine tune your ROBOT-2 code.

4. Post Lab

- Work on completing your ROBOT-2 Assessment in preparation for the demonstration in week 5.
- Revise content from lectures 1 – 4 in preparation for the first quiz on Friday Week 5.
- For further resources:
  - Robot Academy Videos: Robotic Arms and Forward Kinematics
    - https://robotacademy.net.au/masterclass/robotic-arms-and-forward-kinematics/
  - RVC Textbook Refer to Chapter 7.1