

**F20RO & F21RO Intelligent Robotics**

**COURSEWORK 2018/2019**

**Assignment 1**

Using the MACS Linux facility in Room EM2.50, edit the supplied Java program to control the TCP of the robot as detailed below.

- Step 1:** Make sure you have registered for use of the MACS computing facilities using a form obtainable from EM 1.33. Read the *Conditions of Use* on the back of the form – your signature on the front confirms that you undertake to abide by these conditions. Fill in every box on the front of the form – most of it has been pre-completed for you already.
- Step 2:** Make sure you know how to edit, compile and run the Java program supplied. Also make sure you know how to extract code segments from the program and print them off. Contact me if you have any problems.
- Step 3:** Develop an algorithm to determine the necessary joint angles to achieve the TCP position and orientation entered by the user. Code up your algorithm in Java and insert it into the Java program supplied.  
[70% of the marks will be awarded for this]
- Step 4:** This manipulator contains degeneracies. Develop a scheme for handling degenerate points so that only one joint angle solution exists for any TCP position and orientation (E.g. keeping the shoulder tilted up at all times would be a very simple scheme). Code up your scheme in Java and insert it into the Java program supplied.  
[30% of the marks will be awarded for this]

**Submission**

Please submit the code which you have written and inserted into the program (NOT the whole program!) and a brief report (no more than 4 sides of 12 point A4) describing your algorithms. You should demonstrate your solution to me in the Lab session of Week 6 and submit your written report at that time.

**The submission deadline for the report is Monday 15<sup>th</sup> October (Week 6 of Semester 1).**

**Nick Taylor.**