

MTRN4230 - Project 1

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1 Part A: Dynamic forward kinematics

You do not need to include anything in your report for this practical part of the assessment.

2 Part B: UR5e modelling

2.1 Manual Calculation of Forward Kinematic Solutions

2.1.1 Resultant Homography Matrix

2.1.2 Full Written Working

2.1.3 Intermediate Matrices

2.1.4 Explanation of the Meaning of Calculated Matrices

2.2 Model of UR5e Robotic Arm using RVC Toolbox

2.2.1 Forward Kinematic Conversion to Attain Pose with Angles in RPY

2.2.2 Matrix Results and Converted Results

2.3 Validation of Calculations

2.3.1 Screenshot Showing Pose Including the Rotation in RPY Representation

3 Part C: Robot Speed Limits

3.1 Approach to Calculation

3.2 Jacobian Calculation

4 Part D: Robot Singularities

4.1 Determine the DH matrix

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4.3 For what value(s) is the manipulator at a singularity?

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