MTRN4230 Robotics Individual RESEARCH ASSIGNMENT

Introduction

In this assignment, you are supposed to select an industrial application in robotics and do some research and find a suitable robot for that application, follow the problem description and task outline.

Problem description

This assignment has 3 parts:

Part 1: Select an application field for your research.
Research about robot or robots that can be used for that application.

Notes:

- Select industrial application in either manufacturing or logistics. Check [https://link.springer.com/chapter/10.1007/978-3-319-62533-1_1] for more information about classification of robots.
- It should be a fixed robot not a mobile

Part 2: Provide forward kinematics, inverse kinematics of the robot you have selected in Part 1. You can do the modelling in MATLAB.

Part 3: Research about tools and software can be used to program, simulate, or work with that robot.

Task outline

Your research should cover the below topics. The report needs to have enough details however it needs to be concise. Your report needs to be about 700 -1400 words.

1. Describe what is the application you have selected and what is the robot you have found commercially available suitable for that application. Include the reasons you have selected this area of application (0.5%) and that robot (0.5%). Cover the below topics:
   - Safety (0.5%)
   - Workspace (0.5%)
   - Payload (0.5%)
   - Accuracy (0.5%)
2. How the robot and application of robot you have selected is influenced or can be influenced by Industry 4.0 (1.5%)
3. Research about tools and software in relation to that robot. It includes programming (0.25%), simulators (0.25), and training tools (0.5%)
4. Develop forward (2%) and inverse kinematic (2%) of the robot in MATLAB
5. Simulate the robot for both forward (0.25%) and inverse kinematic (0.25%) as a demo in MATLAB, record a video

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version 20.2.1

Checkpoints and deliverables

Due date	Deliverables	Mark
W13	○ Written report ○ Forward and inverse kinematic code in MATLAB ○ Demo as a video to show how forward and inverse kinematics work in MATLAB N*ote: weights are shown above in task outline.*	10%

Assessment overview

Item	***Group Project?*** *(# Students per group)*	***Weight***	***Due date and submission requirements***	***Deadline for absolute fail***	***Marks returned***
Individual Research Project	*Industrial robot application and tools*	*N*	*Week13: 11:59pm, Friday via Teams*	*Week14:11:59pm, Wed.*	*1 week after submission*

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