Intro to Robotics Lab 3

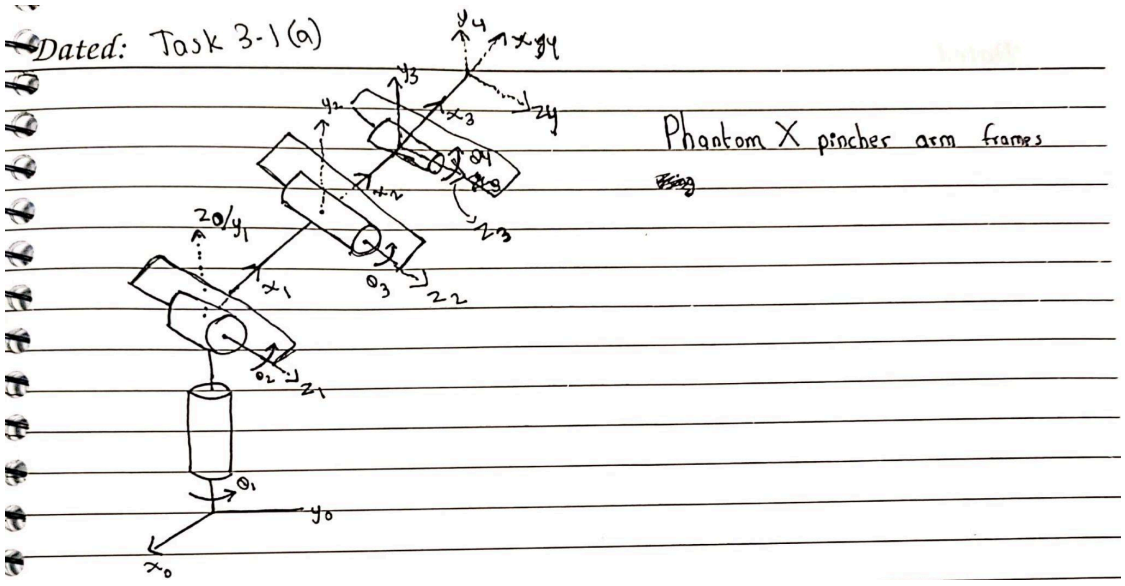
(From Task 3.1 - 3.6)

By Huzaifah, Asghar, Daniyal

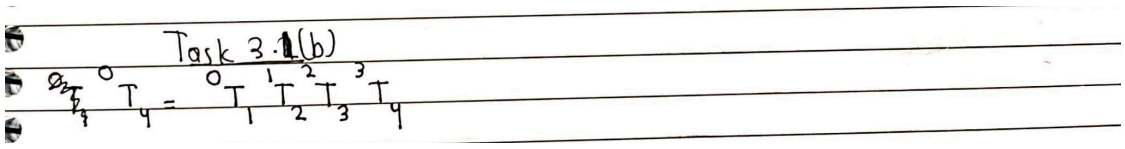
Task 3.1 Frame Assignment (10 points)

Given the functional blocks of Figure 3.1,

(a) assign frames to rigid bodies of interest in Figure 3.2.



(b) describe the pick and place task in terms of frame descriptions, e.g. determine ${}^{A}T_{B}$, the description of frame B with respect to frame A.



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(From Task 3.1 - 3.6)

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Task 3.2 Getting to know the camera (0 points)

Download `Intel RealSense Viewer` tool from Canvas to verify that your camera is working and to explore the various parameters. If you enable both the RGB and depth streams, you shall see live videos for both where the depth stream represents different depths in different colors. Hover over any pixel in the depth image and you shall see the depth value in meters at the bottom.

Null

Task 3.3 Image Manipulation in MATLAB (10 points)

Complete lessons 2.1-2.4 from Module 2 of the course 'Image Processing with MATLAB' (https://matlabacademy.mathworks.com/details/image-processing-with-matlab/mlip#module=2). Your completion will be saved in the 'Progress Report', which you'll submit along with your lab findings report. A textual quick reference guide for this course is available at https://matlabacademy.mathworks.com/artifacts/quick-reference.html?course=mlip&language=en&release=R2023b. Also, the module https://matlabacademy.mathworks.com/details/image-processing-onramp/imageprocessing#module=2 can provide further help with this task.

Task 3.4 Thresholding (10 points)

Complete lesson 2.5 from Module 2 of the course 'Image Processing with MATLAB' (https://matlabacademy.mathworks.com/details/image-processing-with-matlab/mlip#module=2). Also, the module https://matlabacademy.mathworks.com/details/image-processing-onramp/imageprocessing#module=3 can provide further help with this task.

Task 3.5 Color Segmentation (20 points)

Complete Module 4 of the course 'Image Processing with MATLAB' (https://matlabacademy.mathworks.com/details/image-processing-with-matlab/mlip#module=4).

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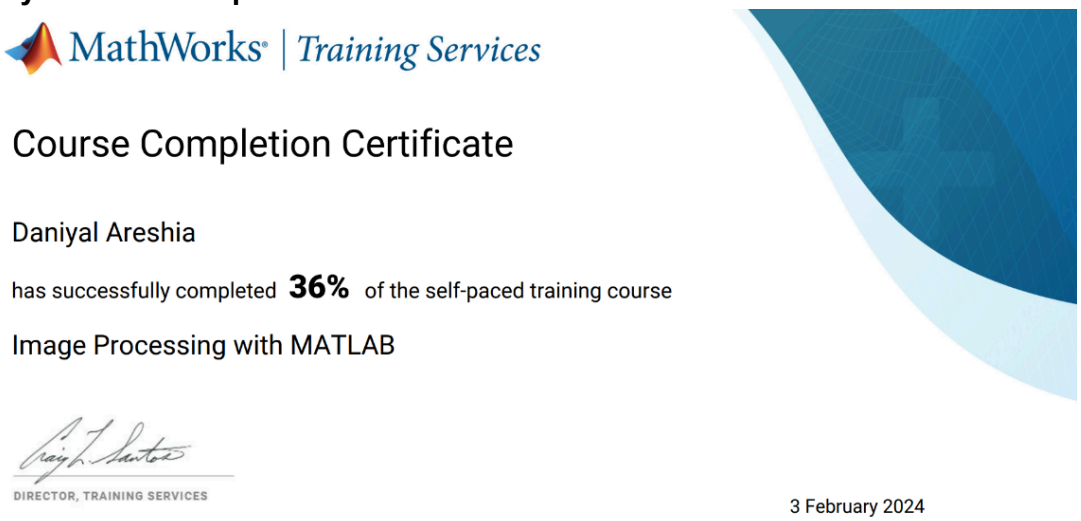
Task 3.6 Connected Components (10 points)

Complete Lessons 7.1, 7.2, and 7.4 from Module 7 of the course 'Image Processing with MATLAB' (https://matlabacademy.mathworks.com/details/image-processing-with-matlab/mlip#module=7).

Daniyal Rahim Completion:



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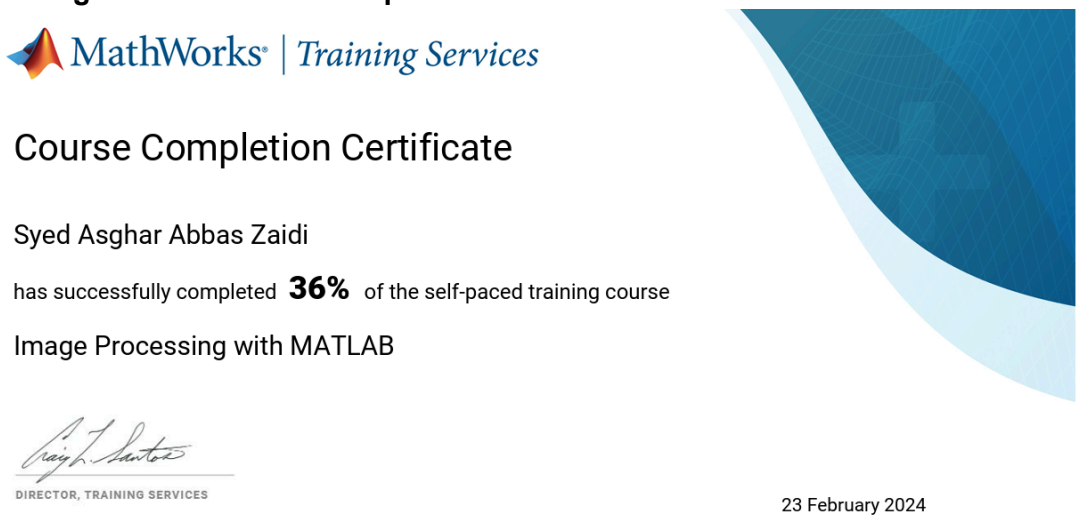

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(From Task 3.1 - 3.6)

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Course modules

- Course Overview 100%
- Working with Image Data 100%
- Preprocessing
- Color Segmentation 100%
- Texture Segmentation
- Improving Segmentations
- Finding and Analyzing Objects 100%
- Detecting Edges and Shapes 5%

Prerequisites:

- MATLAB Onramp
- MATLAB Fundamentals
- Image Processing Onram

Authored By:

K. Grace Ker
MathWorks

This course is also ava

Intro to Robotics Lab 3

(From Task 3.1 - 3.6)

By Huzaifah, Asghar, Daniyal

Appendix:

The latest online version of this document:

Robotics_Lab3_Asghar_Daniyal_Huzaifah