**MAE 547**

**Final Project**

**Fall 20202**

**Team 1**

Members:

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# User Manual

## **1.0 Defining the robot**

*Aim: Create virtual model of robotic arm and plot it in space.*

* 1. Entering DH parameters

*Aim: Use DH parameters to define and plot robotic arm if the user has those already.*

* 1. Finding DH parameters

*Aim: Calculate DH parameters based on information from user.*

* 1. Plot Robotic Arm

*Aim: Plot robotic arm based on DH parameters from 1.1 or 1.2.*

## **2.0 Equations of Motion**

*Aim: Derive and output governing equations.*

## **3.0 Dynamics**

*Aim: Plot joint variables q, q̇, and q̈ as functions of time.*

## **4.0 Indirect force control through compliance control**

*Aim: Plot desired and actual end-effector positions as functions of time. Plot end-effector contact forces as functions of time.*

## **5.0 Indirect force control through impedance control**

*Aim: Plot desired and actual end-effector positions as functions of time. Plot end-effector contact forces as functions of time.*

# Contributions per Team Member

*The following table was created based on the rubric provided in the final project document on Canvas.*

Table 1.

|  |  |  |  |
| --- | --- | --- | --- |
| Task # | Task Name | Code created by | GUI created by |
| 1 | Robot configuration w/ DH parameters |  | Lucas |
|  | Robot configuration w/o DH parameters | Steven |  |
| 2 | Governing equations – equations of motion | Jae |  |
| 3 | Simulating dynamics of the system | Jae |  |
| 4 | Indirect force control through compliance control | Anna |  |
| 5 | Indirect force control through impedance control |  |  |
| 6 | Easy to use and intuitive GUI | Lucas | Lucas |
| 7 | Report |  | N/A |

# References

[1] Siciliano et al. Robotics - Modelling, Planning and Control. Springer. 2010