Assignment 5

ME 639 - Introduction to Robotics

IIT Gandhinagar

Assigned: 25 September, 2024
Due: 11:59pm on **Tuesday, 2nd October, 2024** on GitHub
Collaboration Policy: Discussion with all classmates (including phone calls and WhatsApp messages) and TA are permitted. All the work turned in must be your own.

Tasks:

1. Submit PDFs of your handwritten notes from the last few lectures.
2. Write a subroutine to solve for the inverse position kinematics for the Stanford manipulator using the discussion in Section 4.3.2 in the textbook. Plug in a few representative numerical values to compute the joint variables. Then confirm if you plug in these resulting joint variable answers with your earlier forward position kinematics code that you are indeed obtaining correct answers.
3. Write a python subroutine to calculate the joint velocities using end-effector cartesian velocities (using the discussion in Section 5.4 in the textbook). Heads up: You don't need to write the part about calculating joint accelerations.
4. Read about Euler angles from Section 2.3.2.
5. Read about spherical wrist and tool frame from Section 1.4.7, the last few paragraphs before the Summary 3.2.1, step 6 of Summary 3.2.1, and about its inverse kinematics from Section 4.4.
6. Write a python subroutine for the inverse kinematics of the spherical wrist using the discussion in Section 4.4.