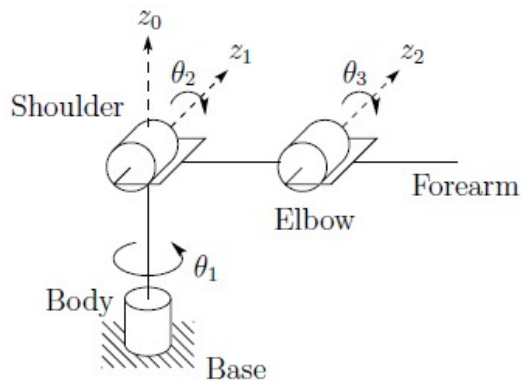


## Homework 4

### RRR arm



$$L_1 = L_2 = L_3 = 1 \text{ m};$$

#### Tasks:

1. Calculate Jacobian (skew theory or numeric method)
2. Joint trajectory  $q(t)$  from  $q(0) = (0.5, -0.6, 0)$  to  $q(2) = (1.57, 0.5, -2.0)$  with null initial and final velocities and accelerations. (polynomial)
3. Joint trajectory for the following commands: PTP -  $q_1 = (0, 0, 0)$  to  $q_2 = (-0.9, -2.3, 1.2)$  (trapezoidal)
  - o Controller command interpretation frequency -  $f = 10 \text{ Hz}$
  - o Maximum joint velocity -  $1 \text{ rad/s}$
  - o Maximum joint acceleration -  $10 \text{ rad/s}^2$
4. Joint trajectory for the following commands: LIN -  $p_1 = (1, 0, 2)$  to  $p_2 = (\sqrt{2}/2, \sqrt{2}/2, 1.2)$  (trapezoidal)
  - o Controller command interpretation frequency -  $f = 10 \text{ Hz}$
  - o Maximum linear velocity -  $1 \text{ m/s}$
  - o Maximum linear acceleration -  $10 \text{ m/s}^2$
5. Visualization (optional)

#### Requirements:

1. Matlab / Python code [1], [2]
2. Report:
  - o Explanation of the solution
  - o Position, Velocity, and Acceleration plots
  - o Link to the project on github.com

Submit only report to moodle.

[1] No allowed to use robotics libraries and toolboxes

[2] Cheat penalty: 0 for Homework.