QArm Recommended Assessment

Singularity Identification

1. Briefly discuss the three different approaches of identifying singularities as presented in this lab. Explain when would you chose one method over the other?

2. Recall that Singularity Condition 1 occurs when the end-effector is positioned directly above the base. Provide a schematic diagram that geometrically describes Singularity Condition 1 in terms of joint angles θ_2 and θ_3, and arm lengths λ_2 and λ_3.

3. Present your results as recorded in Table 1 from the Lab Procedure. When examining singularities, why is it important to also monitor for loss of end-effector motion in frame 4?