hw_wam7ik

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10:34 AM

The forward kinematic map of the 7-dof Barrett WAM is:

$$ {}^{0}_{1}A(q_1) \cdot {}^{1}_{2}A(q_2) \, {}^{2}_{3}A(q_3) \cdots {}^{6}_{7}A(q_7) = {}^{0}_{7}A(q) $$

where $q_i$ is the angle of joint $i$.

Solve the generic inverse kinematics problem of the 7-dof WAM. That is, given ${}^{0}_{7}A_{Goal}$ and a value of $q_3$, find all $q$ such that ${}^{0}_{7}A(q) = {}^{0}_{7}A_{Goal}$.

Choose the origin of frame 0 to be at the intersection of joints 1, 2, & 3 as shown on the WAM diagram. Choose the origin of frame 7 to be at the intersection of joints 5, 6, & 7. This is 60 mm below its location on the WAM diagram, i.e. choose $d_7 = 0$.

Turn in a Matlab function w/ the following interface:

$$q = \text{wam7ik}(A07_{goal}, q_3)$$

where $q$ is a 7 x nsoln array, with each column being an ik solution.