KINOVA

SOLUTION

DH Parameters & Forward Kinematics

Last update: 2021-04-21

Gen3 lite Cursus

KINOVA

Table of contents

KINOVA

Manipulations

Part 1: Implementation of the forward kinematics

1.1

Direct implementation of the formula given in the *Theory* section.

1.2 & 1.3

See associated .m files.

Part 2: Validation with the robot

2.1

The exact values for the pose may be different from robot to robot, but should all be close to the following. Check with your own robot for more accurate results.

Test #	$\boldsymbol{\theta}$ (deg)	[x, y, z, $\boldsymbol{\theta}_x$, $\boldsymbol{\theta}_y$, $\boldsymbol{\theta}_z$]
1	[0, 0, 0, 0, 0, 0,]	[0.057, 0.01, 1.003, 0, 0, 90]
2	[90, 0, 0, 45, 45, 45]	[0.087, 0.158, 0.0934, 145, -150, 100]
3	[0, 344, 75, 0, 300, 0]	[0.439, 0.193, 0.448, 90, -1, 150]
4	[7, 21, 150, 285, 340, 270]	[0.207, -0.019, 0.139, 30, 168, 87]

TABLE 2: Angular positions to test

2.2

The theoretical results should be very close, but not quite perfect.

2.3

There are unique manufacturing defects on each unit making the ideal DH parameters given by the user guide not exact. Another valid answer is also that the robot has a tolerance on its destination when commanded using the API.

Acknowledgements

This document was produced in collaboration with the following establishments

Including direct implication from the following people:

- Prof. David Saussié, Eng., M.A.Sc., Ph.D., Department of Electrical Engineering.
- Alexis Tang, M.Eng., Department of Electrical Engineering
- Prof. Jérôme Le Ny, Eng., M.A.Sc., Ph.D., Department of Electrical Engineering.
- Prof. Richard Gourdeau , B.A.Sc., M.A.Sc., Ph.D., Department of Electrical Engineering.
