# Milestone 2 Report

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## 1 DH Convention

#### 1.1 X-Z Frames

We drew X-Z frames over 2 different views as follows :

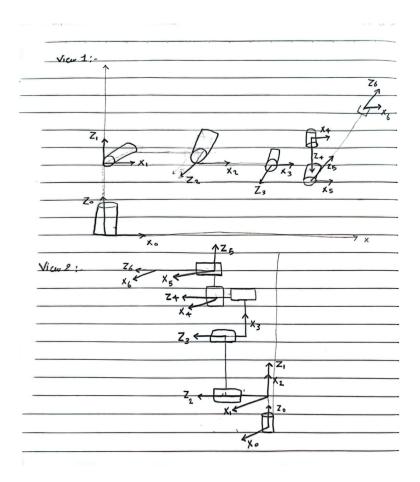


Figure 1: X-Z frames over 2 different views

Joint i	$q_i$	$d_i$	$a_i$	$\alpha_i$ [rad]
1	$q_1$	L1	0	$+\frac{\pi}{2}$
2	$q_2$	0	L2	0
3	$q_3$	0	L3	0
4	$q_4$	L4	0	$+\frac{\pi}{2}$
5	$q_5$	L5	0	$-\frac{\pi}{2}$
6	$q_6$	L6	0	0

#### 1.1.1 DH-parameters Table

#### 1.2 Forward Kinematics

for our forward kinematics values we noticed that the x and y are reversed from the frames we used for table parameters and therefore multiplied them by -1. We tried multiple angles, 3 examples of which are :

#### 1. no rotation

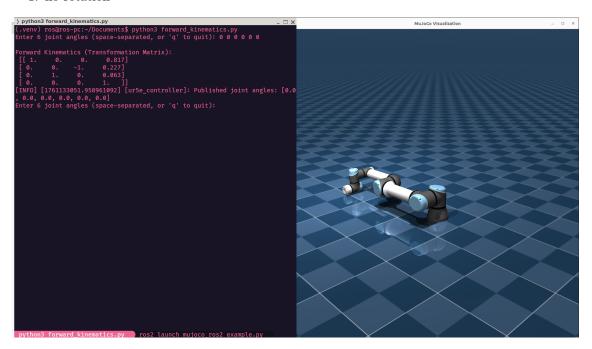


Figure 2: no rotation

#### 2. -90 °in x

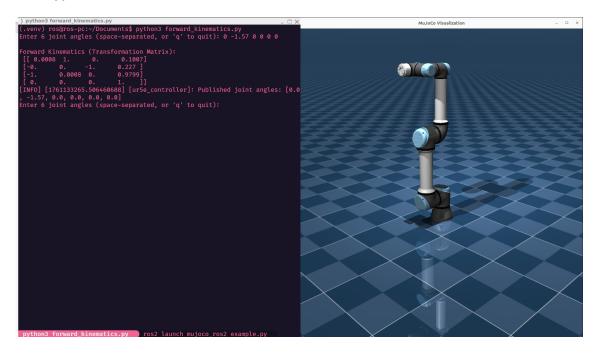


Figure 3: -90 rotation in x

#### $3.\ 90\ \mathrm{deg}$ in z

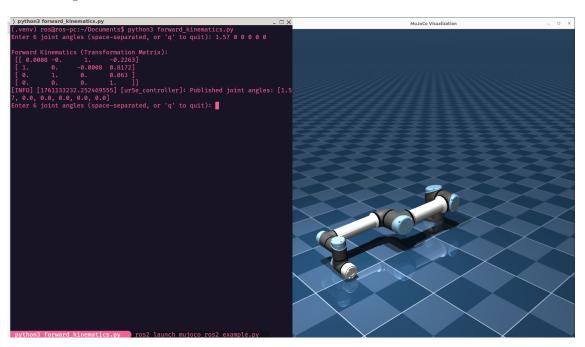


Figure 4: 90 rotation in z

### 2 Inverse Kinematics

The python library ikpy.chain was used to calculate the inverse kinematics angles for each joint as follows:

```
$ python3 inverse_kinematics.py
Enter x y z: 5 3 10
[INFO] [1761071926.125999728] [ur5e]: UR5e node started

6 Revolute Joint Angles:
[0.25291308909618465, -1.0539639678931723, 0.0003348687
535521464, -1.571591560766321, 0.0, 0.0]
Enter x y z:
```

Figure 5: inverse kinematics