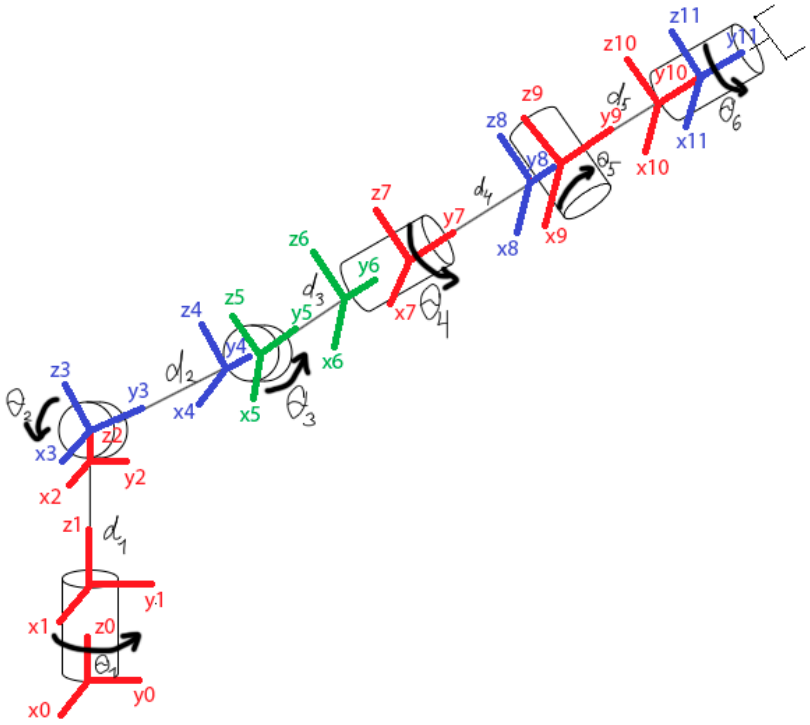
Chosen manipulator

For this task I decided to chose an anthropomotphic manipulator with yzy spherical wrist.



Forward kinematics

I found position of the end effector in this way:

$$P_{end} = P_{base}R_z(\theta_1)T_z(d_1)R_x(\theta_2)T_y(d_2)R_x(\theta_3)T_y(d_3)R_y(\theta_4)T_y(d_4)R_z(\theta_5)T_y(d_5)R_y(\theta_6)$$

where P_{base} is an identity 4x4 matrix, $R_{axis}(\theta)$ is a rotation matrix in homogeneous representation on given angle θ around given axis and $T_{axis}(d)$ is a translation matrix in homogeneous representation on given axis on given distance.

Plots obtained:

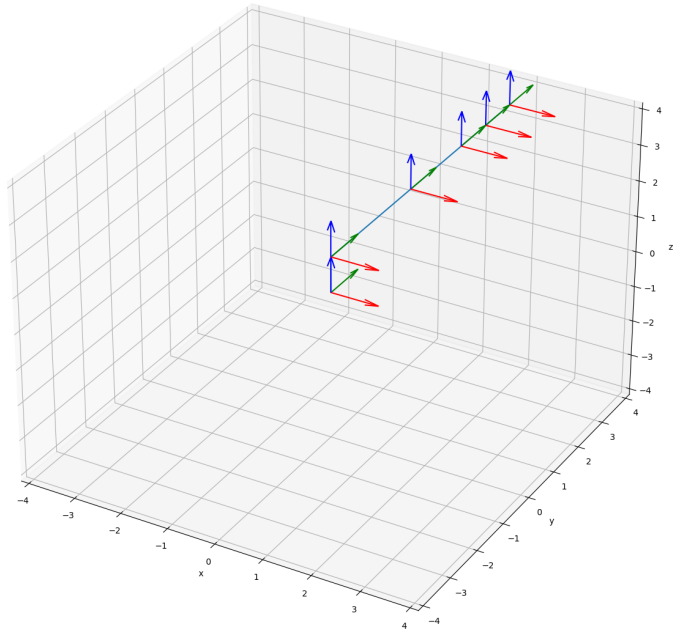


Figure 1: Obtained positions for zero angles

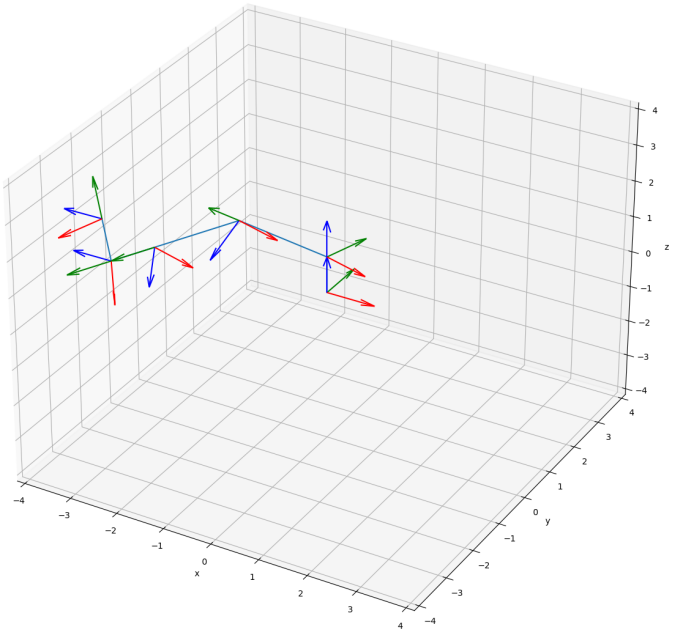


Figure 2: Obtained positions for random angles