

Day 11

Trajectory Generation

# Inverse Kinematics Recap

1. Solve for the first 3 joint variables  $q_1, q_2, q_3$  such that the wrist center  $o_c$  has coordinates

$$o_c^0 = o - d_6 R \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix}$$

2. Using the results from Step 1, compute  $R_3^0$
3. Solve for the wrist joint variables  $q_4, q_5, q_6$  corresponding to the rotation matrix

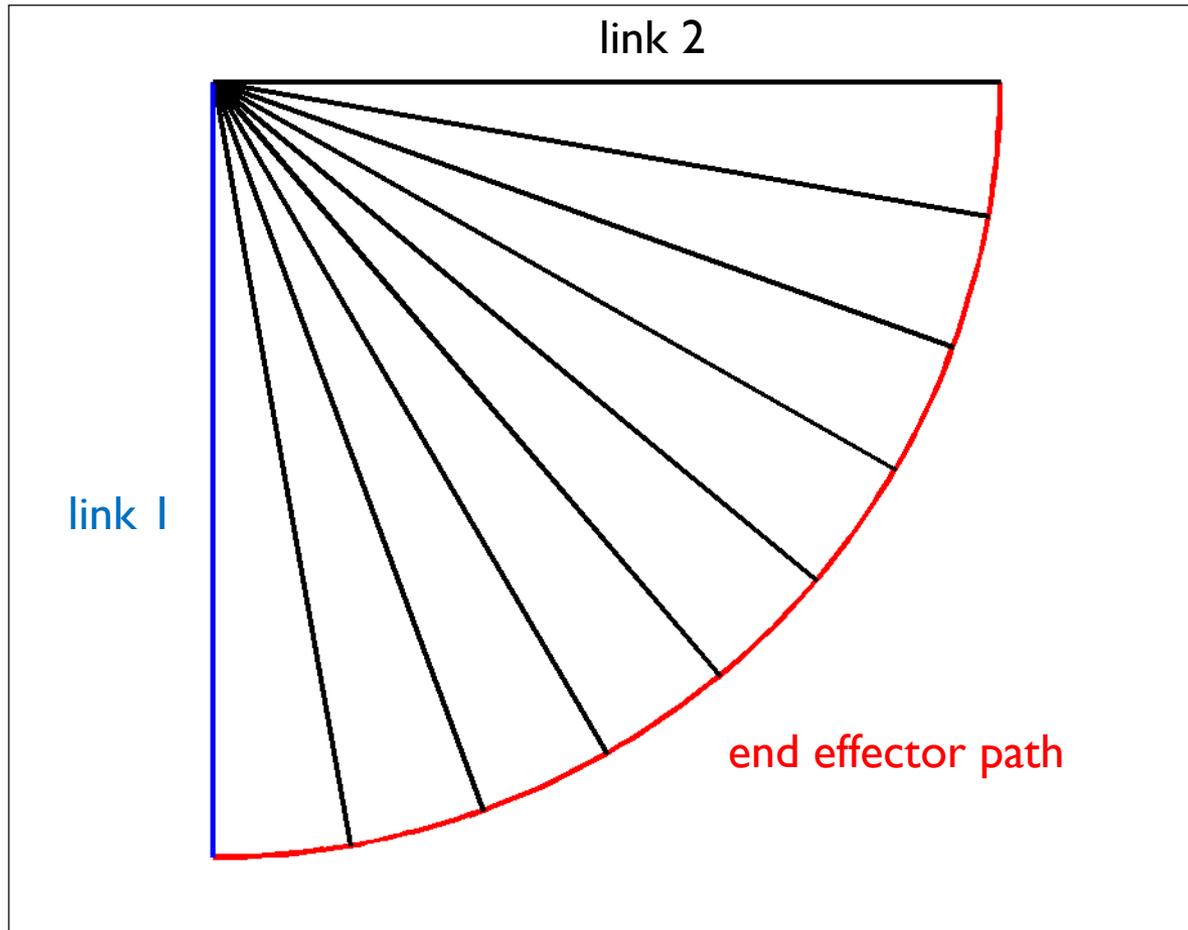
$$R_6^3 = (R_3^0)^T R$$

# Path Generation

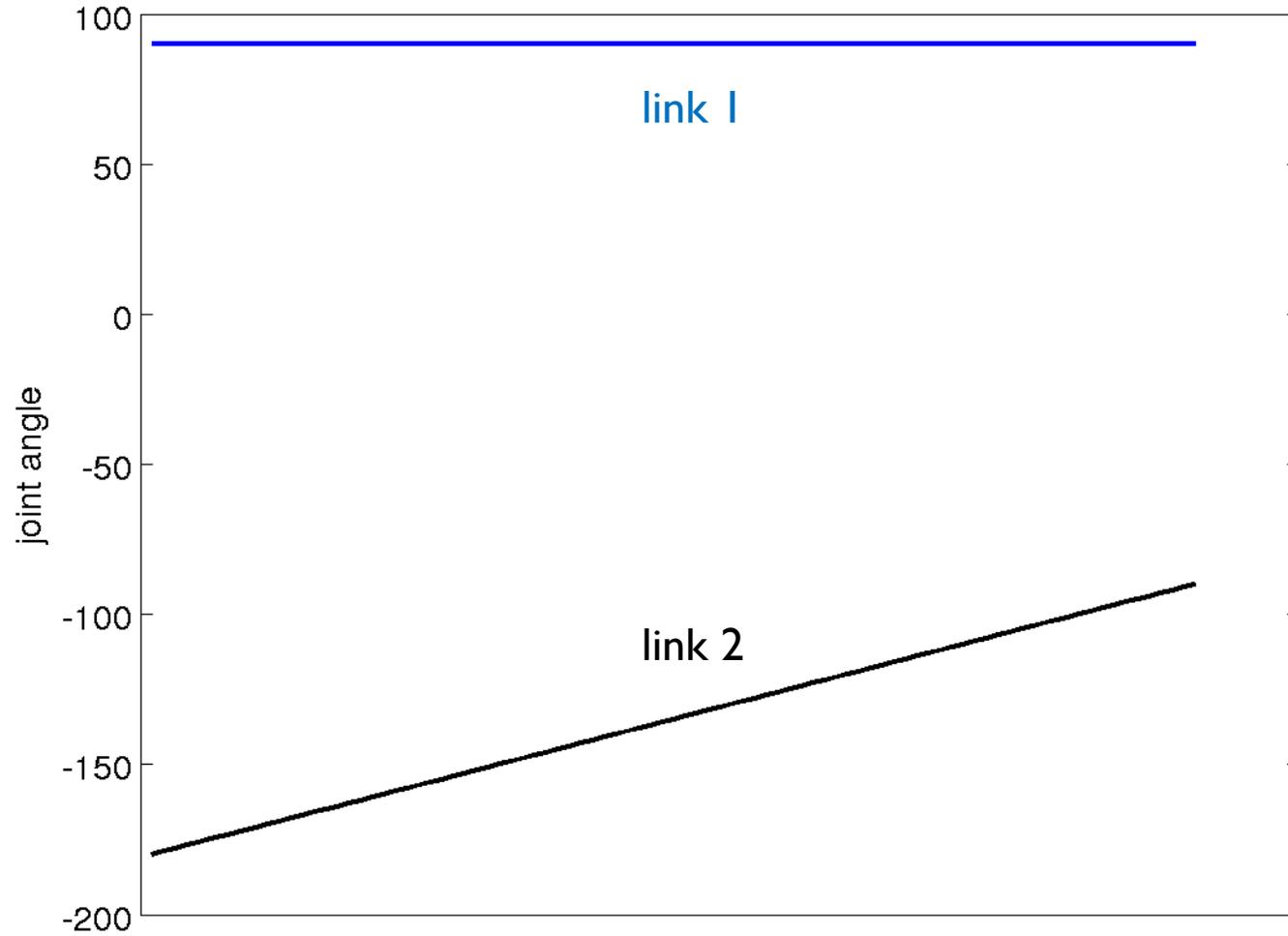
- ▶ a path is defined as a sequence of configurations a robot makes to go from one place to another
- ▶ a trajectory is a path where the velocity and acceleration along the path also matter

# Joint-Space Path

- ▶ a joint-space path is computed considering the joint variables

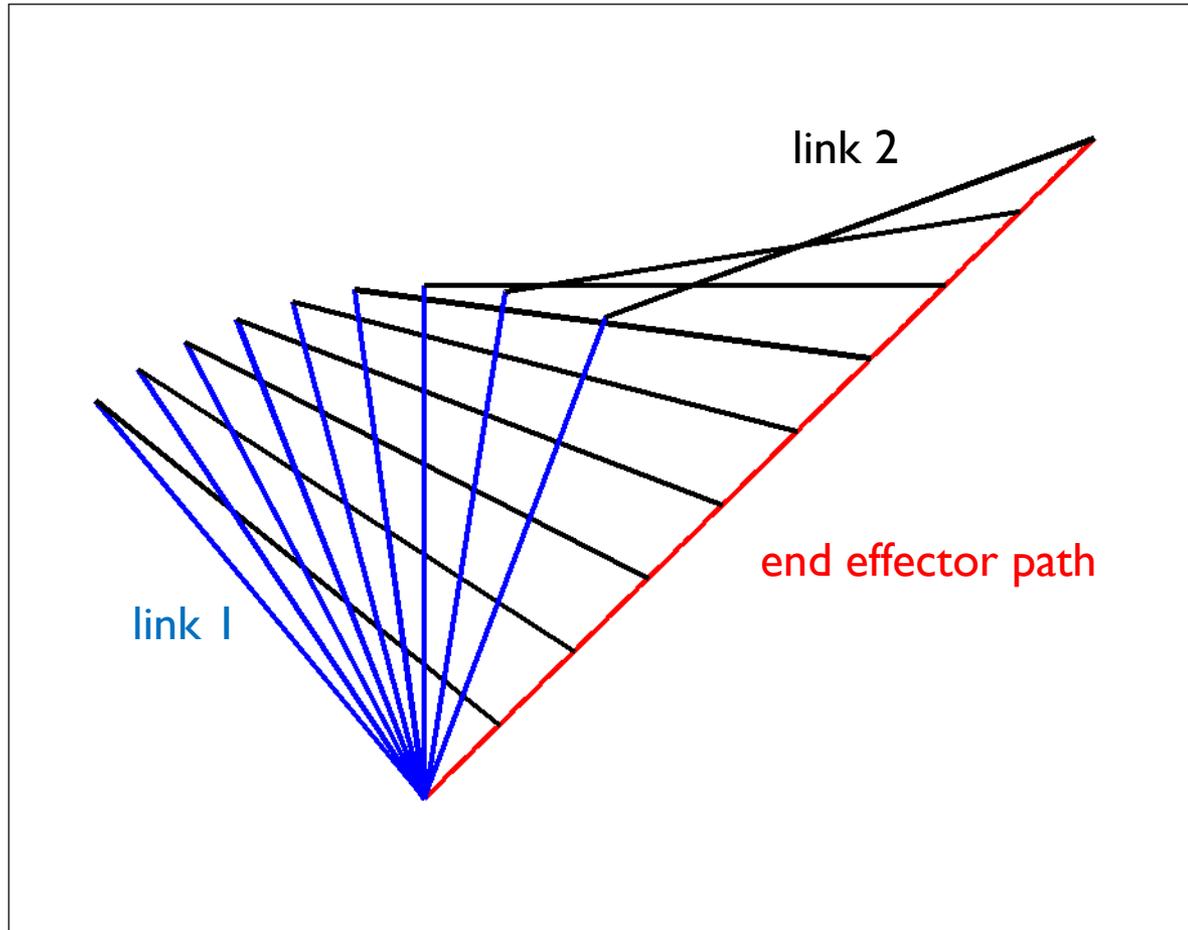


# Joint-Space Path Joint Angles

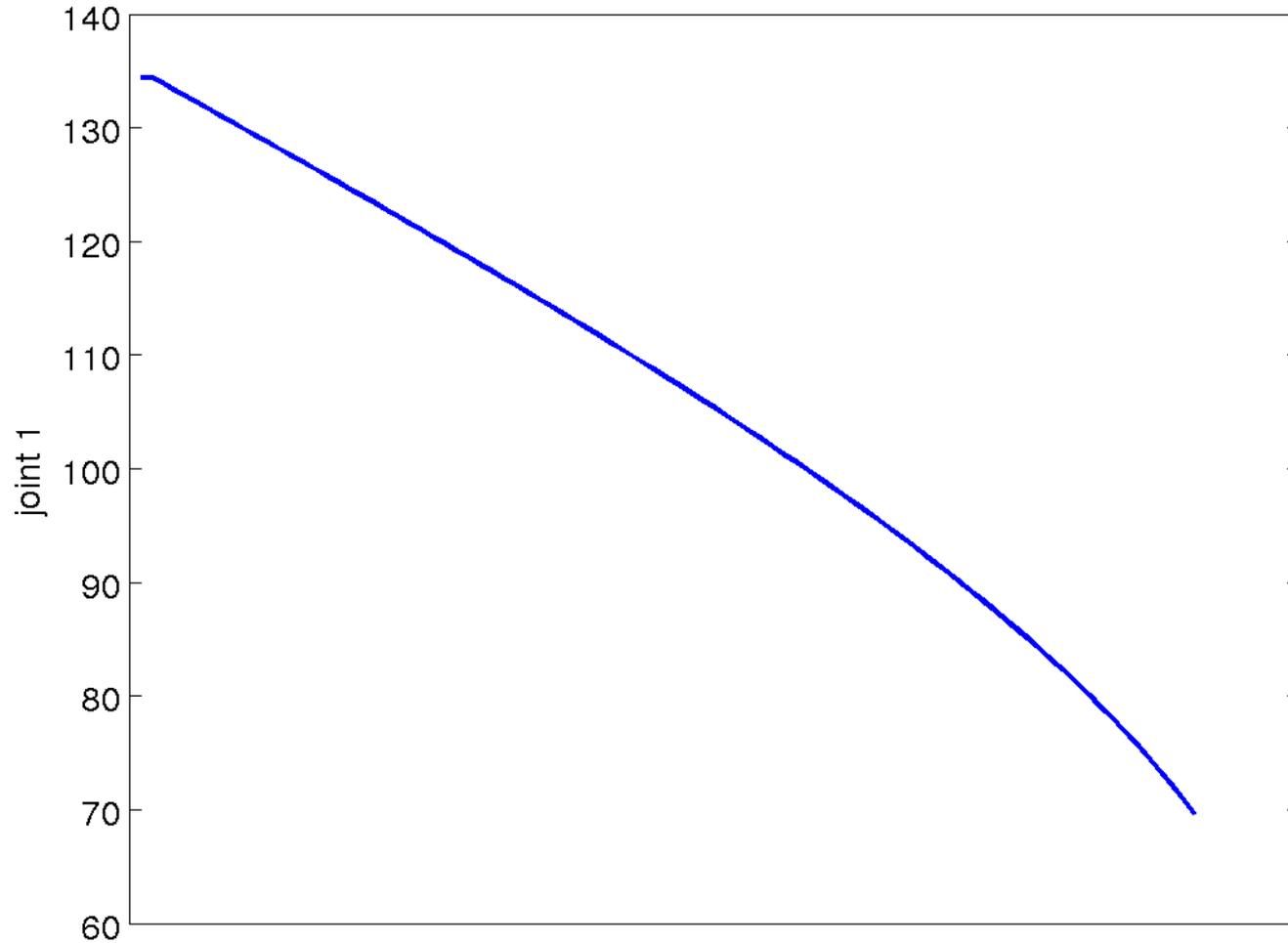


# Cartesian-Space Path

- ▶ a Cartesian-space path considers the position of end-effector



# Cartesian-Space Path Joint Variable 1



# Cartesian-Space Path Joint Variable 2

