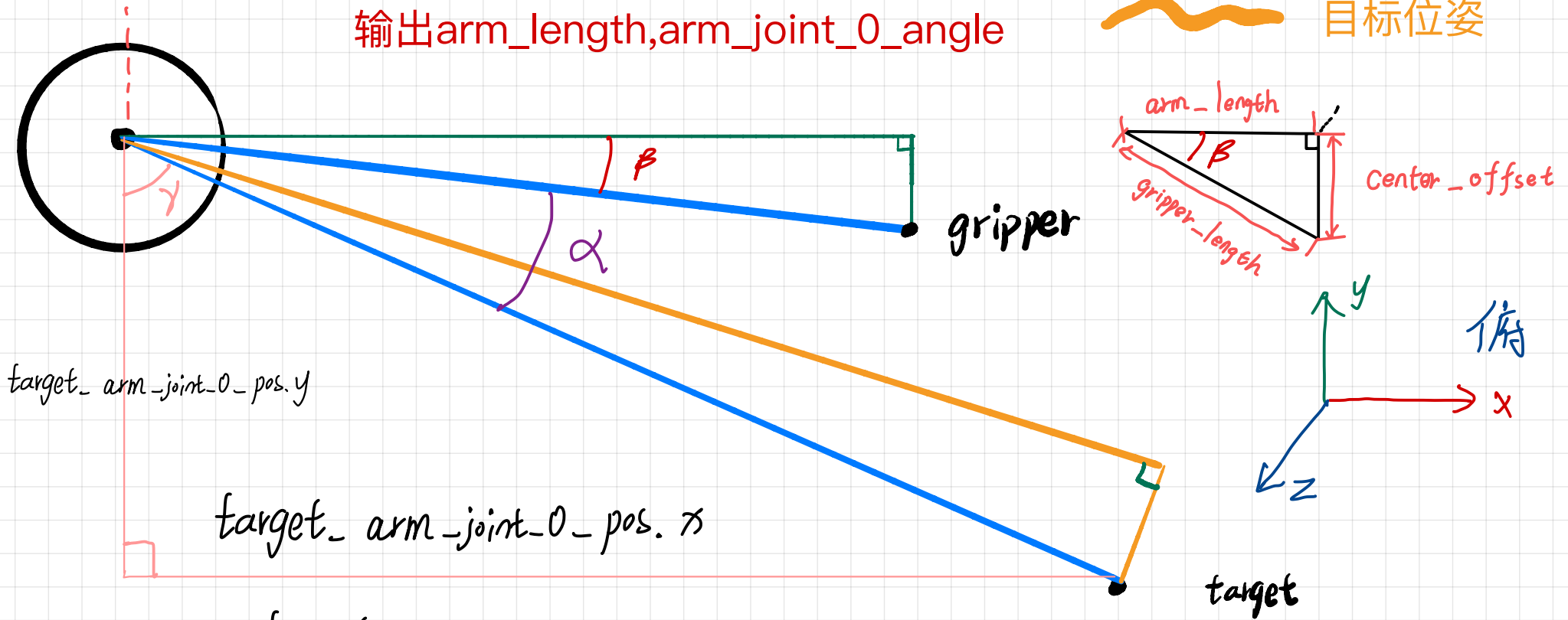


center_offset = 0.00551

arm_joint-0

输出 arm_length, arm_joint_0_angle

起始位姿
目标位姿



target_pos \Rightarrow target_arm_joint-0_pos

$$\beta = \arctan \left(\frac{\text{center_offset}}{\text{arm_length}} \right)$$

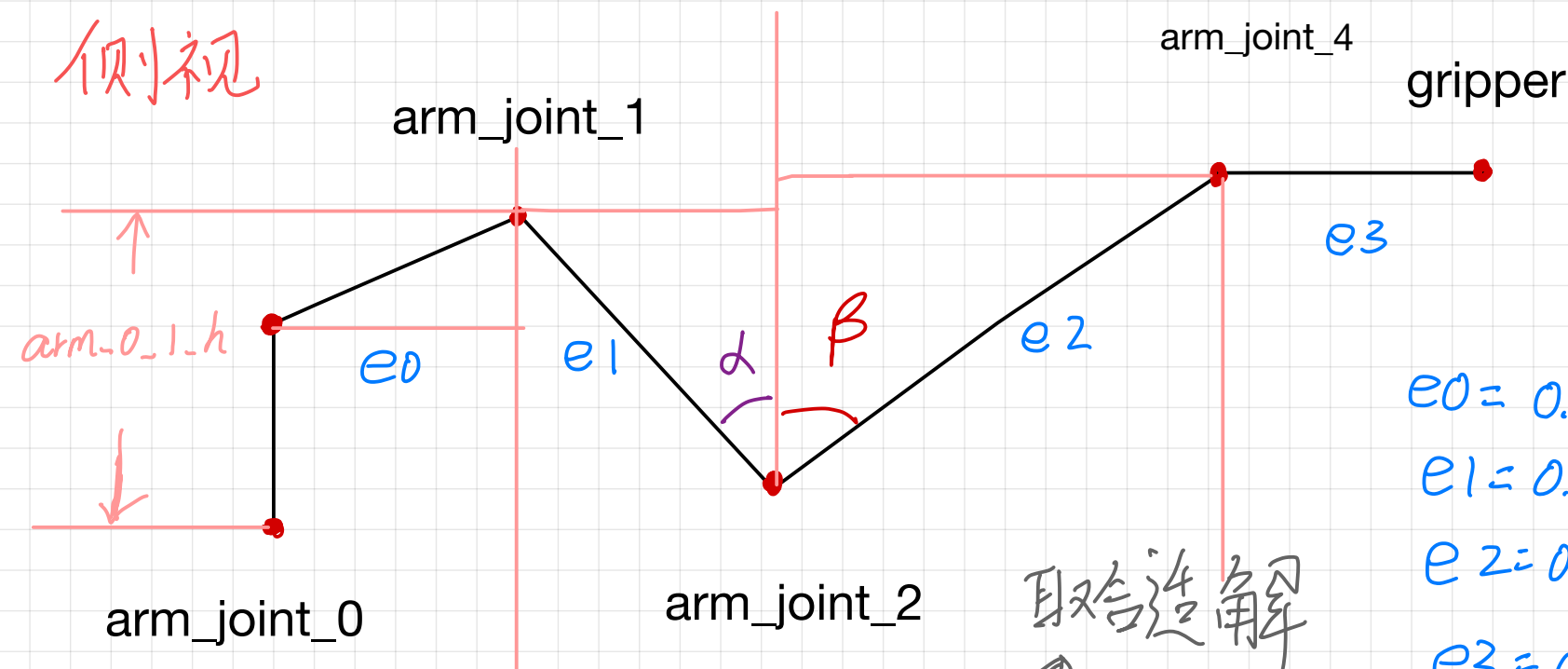
$$\gamma = \arctan \left(\text{target_arm_joint-0_pos.x} / \text{target_arm_joint-0_pos.y} \right)$$

$$\alpha = \frac{\pi}{2} - \beta - \gamma \quad \Rightarrow \quad \text{gripper_length} = \sqrt{\dots y^2 + \dots x^2} \Rightarrow \text{arm_length}$$

$$\text{arm_joint_0_angle} = \alpha$$

侧视

输出三个关节的旋转度数



$$\begin{aligned} e0 &= 0.115 \\ e1 &= 0.230 \\ e2 &= 0.256 \\ e3 &= 0.228 \end{aligned}$$

$$\text{arm-o-1-h} = 0.204$$

$$\begin{cases} \text{arm_length} = e0 + e1 \cdot \sin \alpha + e2 \cdot \sin \beta + e3 \\ \alpha + \beta \geq \frac{\pi}{2} \end{cases}$$

$$\begin{aligned} \text{arm-o-1-h} - e1 \cdot \cos \alpha + e2 \cdot \cos \beta + \text{plat_position} \\ = \text{target_arm_joint-0_pos. z} \end{aligned}$$

<假设升降位置合适>

$$\begin{cases} \text{arm_joint-1-angle} = \alpha - \frac{\pi}{2} \\ \text{arm_joint-2-angle} = \frac{3\pi}{2} - (\alpha + \beta) \\ \text{arm_joint-4-angle} = \pi - \beta \end{cases}$$

取合适解