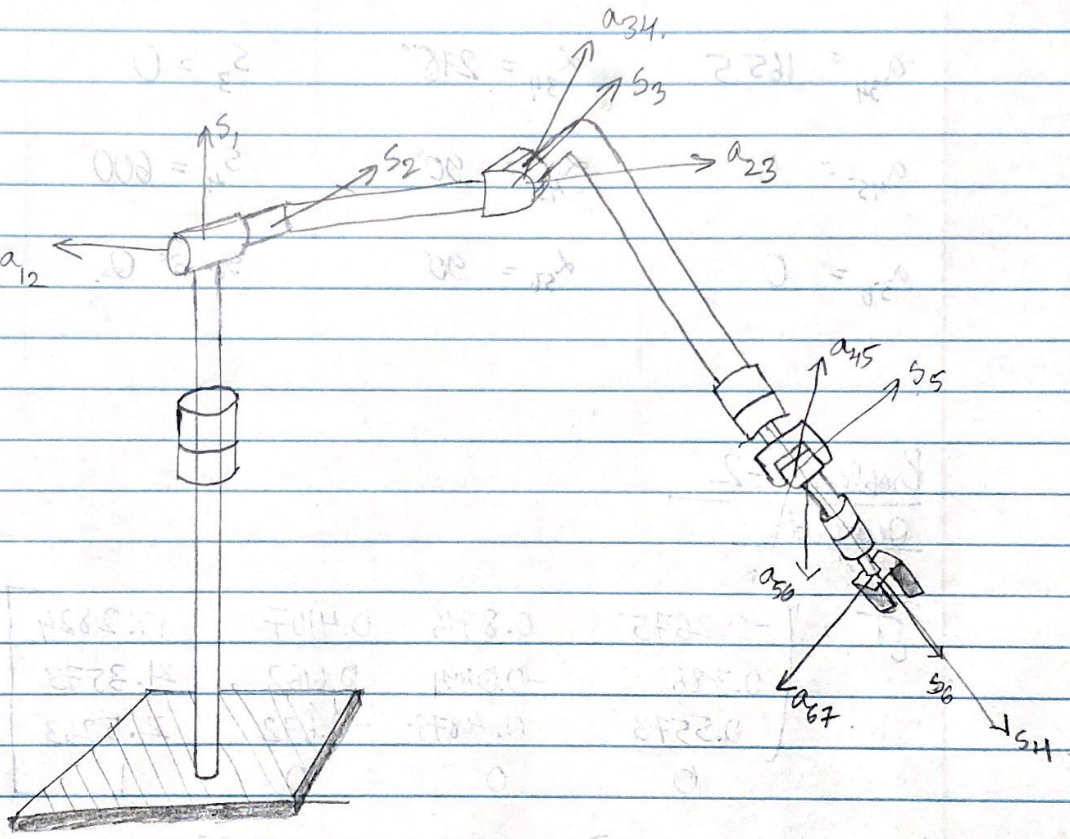
EML 6281

Robot Geometry — I

Homework #3

① PUMA 700



Puma mechanism parameters.

Link length, mm	Twist angle deg	Joint Offset, mm	Joint Angles deg.
$a_{12} = 0$	$\alpha_{12} = 90°$		ϕ_1 = variable
$a_{23} = 650$ mm	$\alpha_{23} = 0$	$S_2 = 355.5$	θ_2 = variable
$a_{34} = 165.5$	$\alpha_{34} = 270°$	$S_3 = 0$	θ_3 = variable.
$a_{45} = 0$	$\alpha_{45} = 90°$	$S_4 = 600$	θ_4 = variable.
$a_{56} = 0$	$\alpha_{56} = 90°$	$S_5 = 0.$	θ_5 = variable

Problem -2

Outputs

$$ {}^{F}_{6}T = \begin{bmatrix} -0.2675 & 0.8716 & 0.4107 & 17.2824 \\ 0.786 & -0.0491 & 0.6162 & 21.3573 \\ 0.5573 & 0.4877 & -0.672 & 2.5263 \\ 0 & 0 & 0 & 1 \end{bmatrix} $$

$$ {}^{F}P_{tool} = \begin{bmatrix} 23.0984 \\ 33.4783 \\ 9.7551 \\ 1 \end{bmatrix} \quad {}^{F}_{56} = \begin{bmatrix} 0.4107 \\ 0.6162 \\ 0.672 \\ 0 \end{bmatrix} \quad {}^{F}a_{67} = \begin{bmatrix} -0.2675 \\ 0.7860 \\ 0.5573 \\ 0 \end{bmatrix} $$