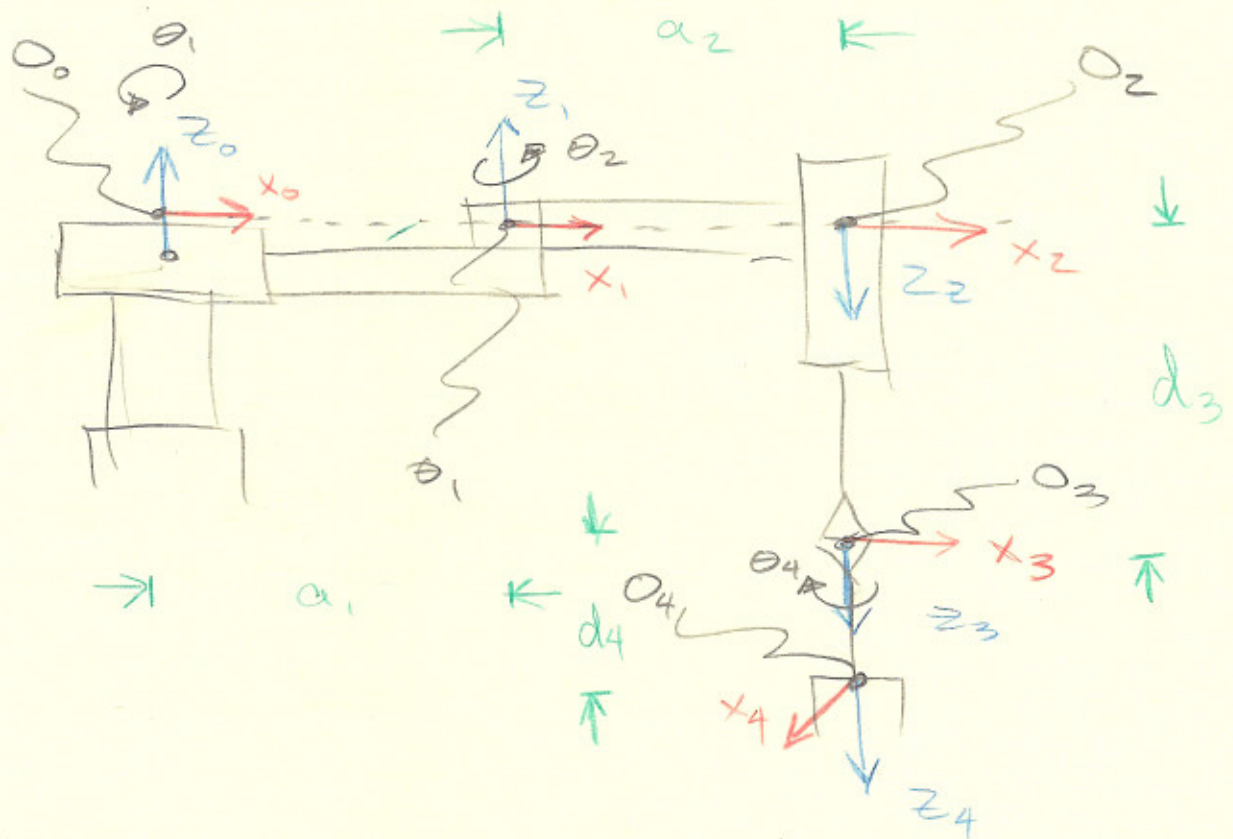


Midterm February 26th 4:00 → 5:30

will give: DH representation

know: transformations about XYZ

Selective
 Component
 Articulated
 Robot
 Assembly
 Manipulator



Note y axis is not necessary.

Table of parameters

Link	a_i	d_i	θ_i	α_i
1	a_1	0	θ_1^*	0
2	a_2	0	θ_2^*	180°
3	0	d_3^*	0	0
4	0	d_4	θ_4^*	0

This table of parameters you can get the homogeneous transformation

$${}^0_4H = A_1 A_2 A_3 A_4$$

$$= \begin{bmatrix} {}^0_4R & {}^0_4P \\ 0 & 1 \end{bmatrix}$$

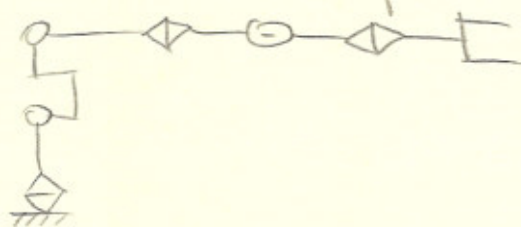
Note

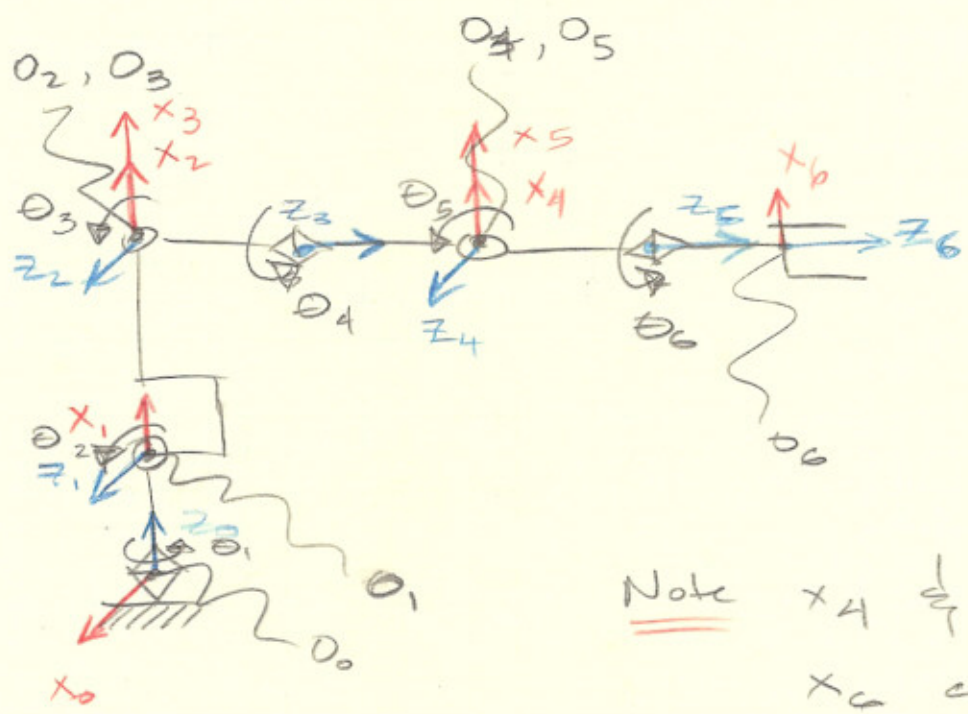
$$\sin(x \pm y) = S_x C_y \pm C_x S_y$$

$$\cos(x + y) = C_x C_y - S_x S_y$$

Ex:

GMS S-400 robot
(RRR and spherical wrist)





Note $x_4 \perp x_5$
 x_6 could be down b/c they are still orthogonal to the plane

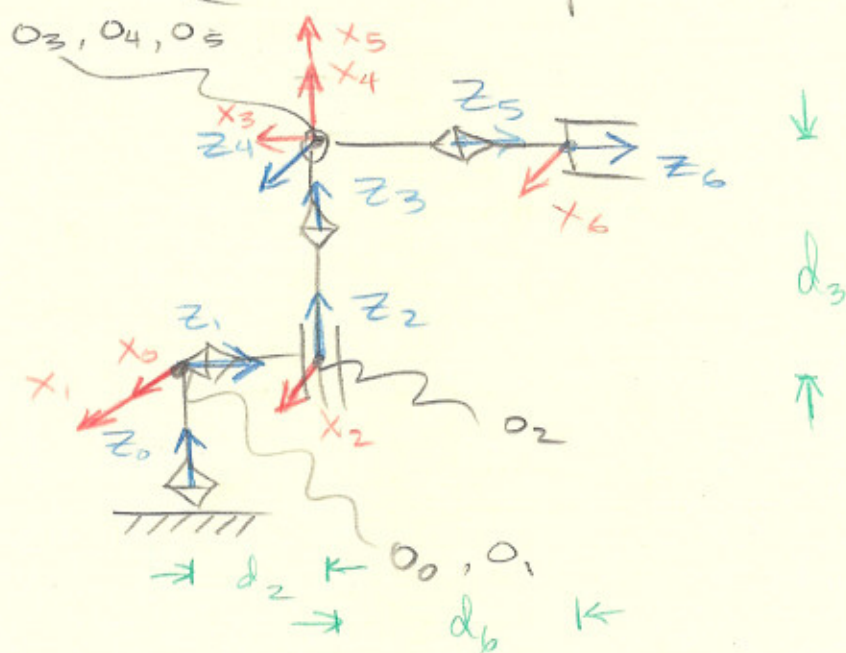
Links	a_i	d_i	α_i	θ_i
1	0	d_1	90	θ_1^*
2	a_2	0	0	θ_2^*
3	0	0	90	θ_3^*
4	0	d_4	-90	θ_4^*
5	0	0	90	θ_5^*
6	0	d_5	0	θ_6^*

Then we obtain the homogenous transformation

$${}^0_6H = \prod_{i=1}^6 A_i$$

Stanford Manipulator

(RRP + spherical wrist)



Links	a_i	d_i	α_i	θ_i
1	0	0		
2	0	d_3^*		
3	0	0		
4	0	0		
5	0	0		
6	0	d_6^*		