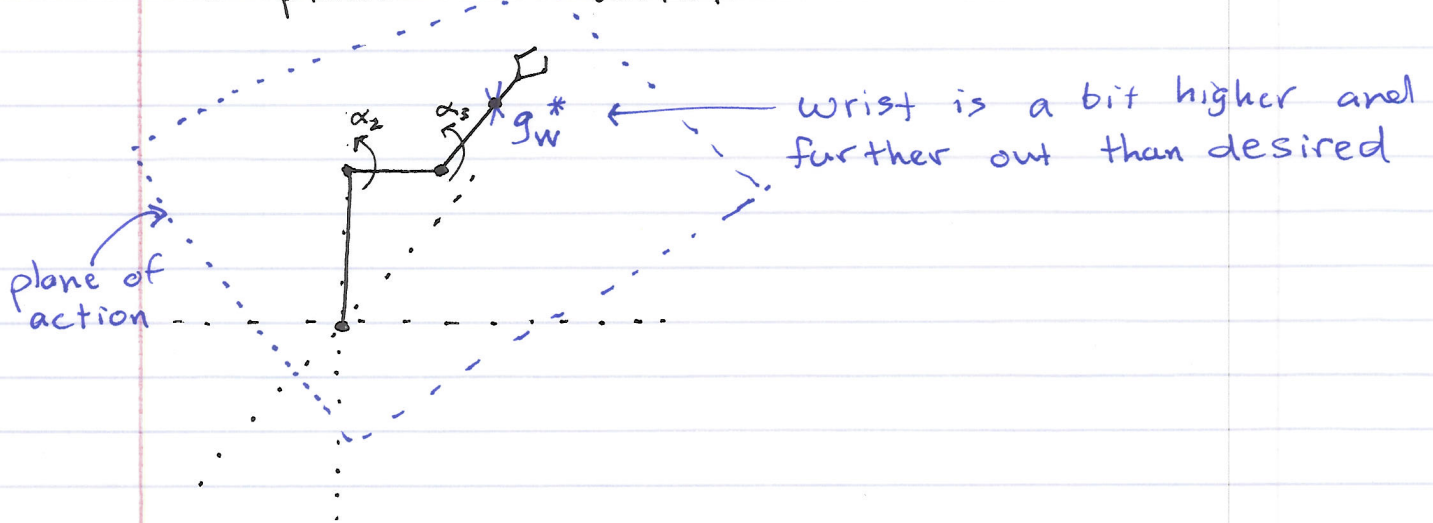
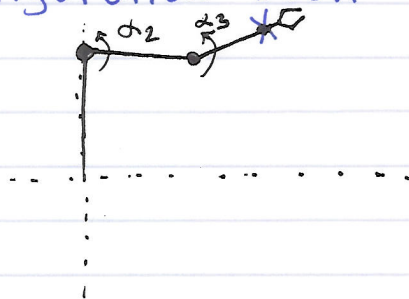


last time we placed the manipulators "plane of action" to include the point where we would like to place the wrist.

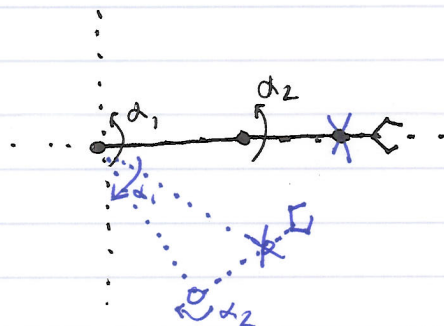


configuration seen in plane

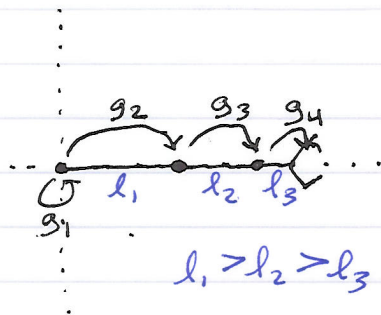


placement of only the position of the wrist reduces to the previous subproblem, with an appropriate coordinate change

shift origin up



Example Consider the planar 3R manipulator



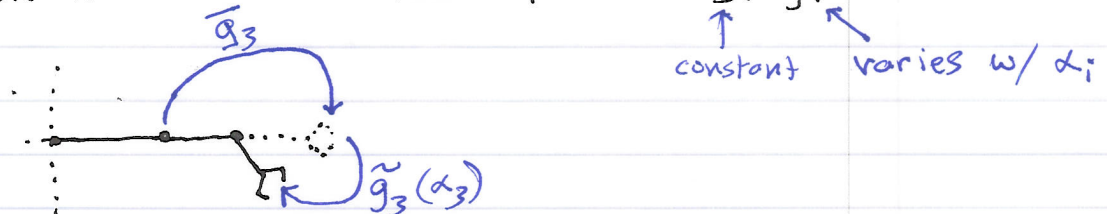
Here we have full of orientation inside dextous workspace

We have a defined end-effector config. g_e^*

$$g_e(\alpha) = g_1(\alpha_1) g_2(\alpha_2) g_3(\alpha_3) g_4$$

↑
constant

Each $g_i(\alpha_i)$ can be broken up into $\bar{g}_i \tilde{g}_i(\alpha_i)$



$$g_e(\alpha) = \underbrace{g_1(\alpha_1) g_2(\alpha_2) \bar{g}_3}_{\text{moves to wrist}} \underbrace{\tilde{g}_3(\alpha_3) g_4}_{\text{wrist to gripper}} \quad (*)$$

Goal is to find an α^* such that $g_e^* = g_e(\alpha^*)$

\Rightarrow Use equation (*) above to break this down into 2 problems

find α such that

$$g_e^* = g_e(\alpha) = g_1(\alpha_1) g_2(\alpha_2) \bar{g}_3 \tilde{g}_3(\alpha_3) g_4$$

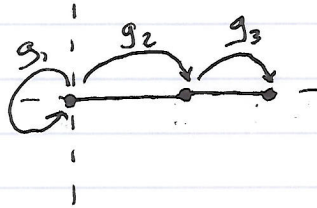
$$g_e^* g_4^{-1} = g_1(\alpha_1) g_2(\alpha_2) \bar{g}_3 \underline{\underline{\tilde{g}_3(\alpha_3)}}$$

↳ does not change my position!

$$\text{position}(g_e^* g_4^{-1}) = \text{position}(g_1(\alpha_1) g_2(\alpha_2) \bar{g}_3)$$

⇒ First Problem

Use triangle solution to find α_1 and α_2



After this, solve for orientation.