Fall

_____

_____

_____

_____

Cost: reduce force on hand.

Free gravity

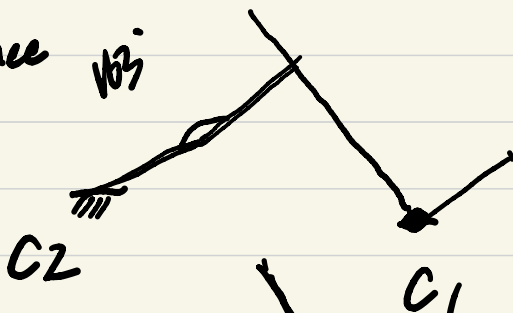C_1: Left knee and right knee position

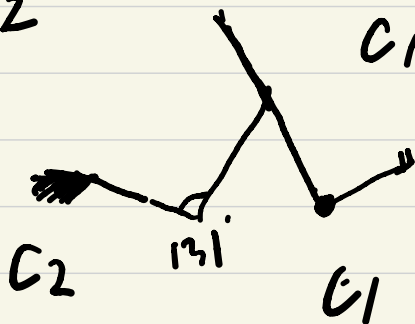fix knee joint

C_2. Left hand position
  right knee V_2?

4
Constants
friction.
knee joint
  lock
constraint

1.

C_2

C_1

U_1
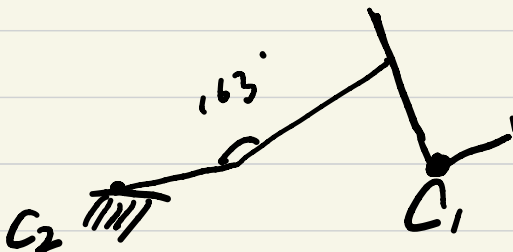
V_2?

2.

C_2 131

C_1

3.

C_2 163

C_1

Cost : ① reduce force on hand

② rotate the torso along longitudial axis
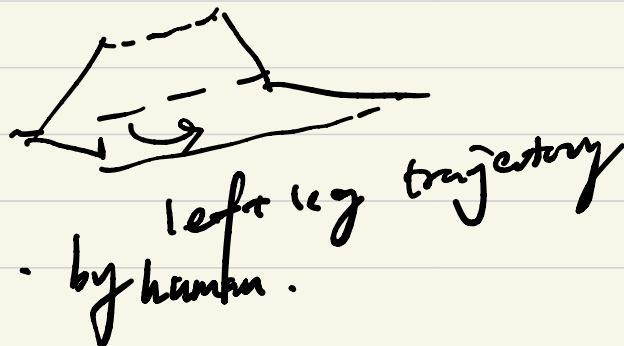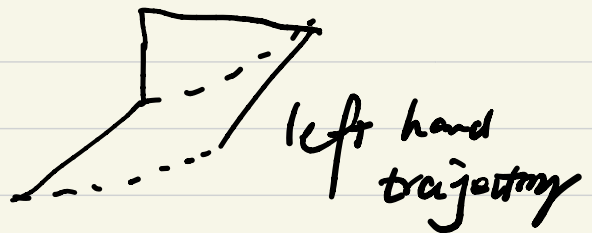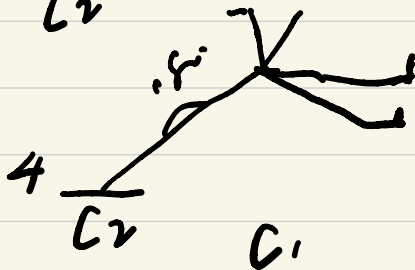
③ leg trajectory (left)
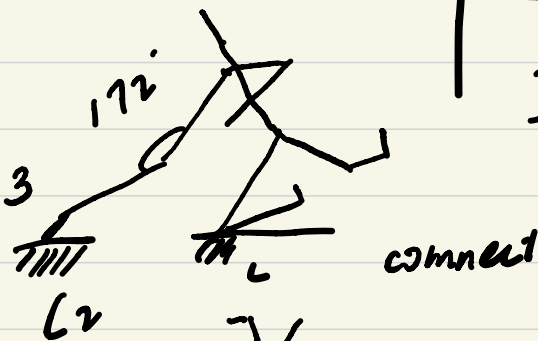
④ hand trajectory (left)

C_1 : right knee

C_2 : right hand

frameplacement $s \geq 3$,

$\underline{C}_1$. C_2 . position constraint

friction constraints

1

$18i$

2

$8i$

C_2

C_1

3

$17i$

C_2

connect

4

$8i$

C_2 C_1

left hand trajectory

left leg trajectory
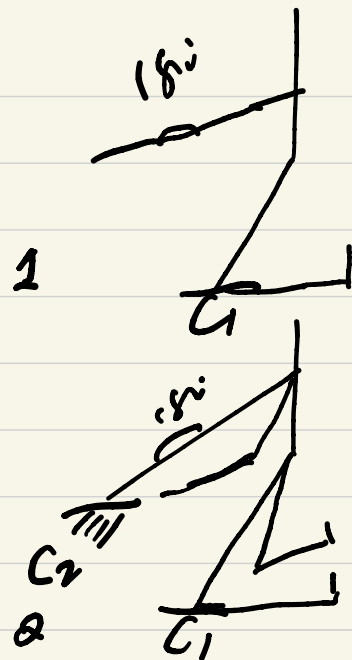
Generate ·· by human .

Plan

1. Attach 4 points on URDF

2. Check API
   force cost
   position constraint
   rotation cost
   position cost

3. Write code } Optimization

4. Test

5. Simulation

6. Test bed

7. Experiment

8. Paper