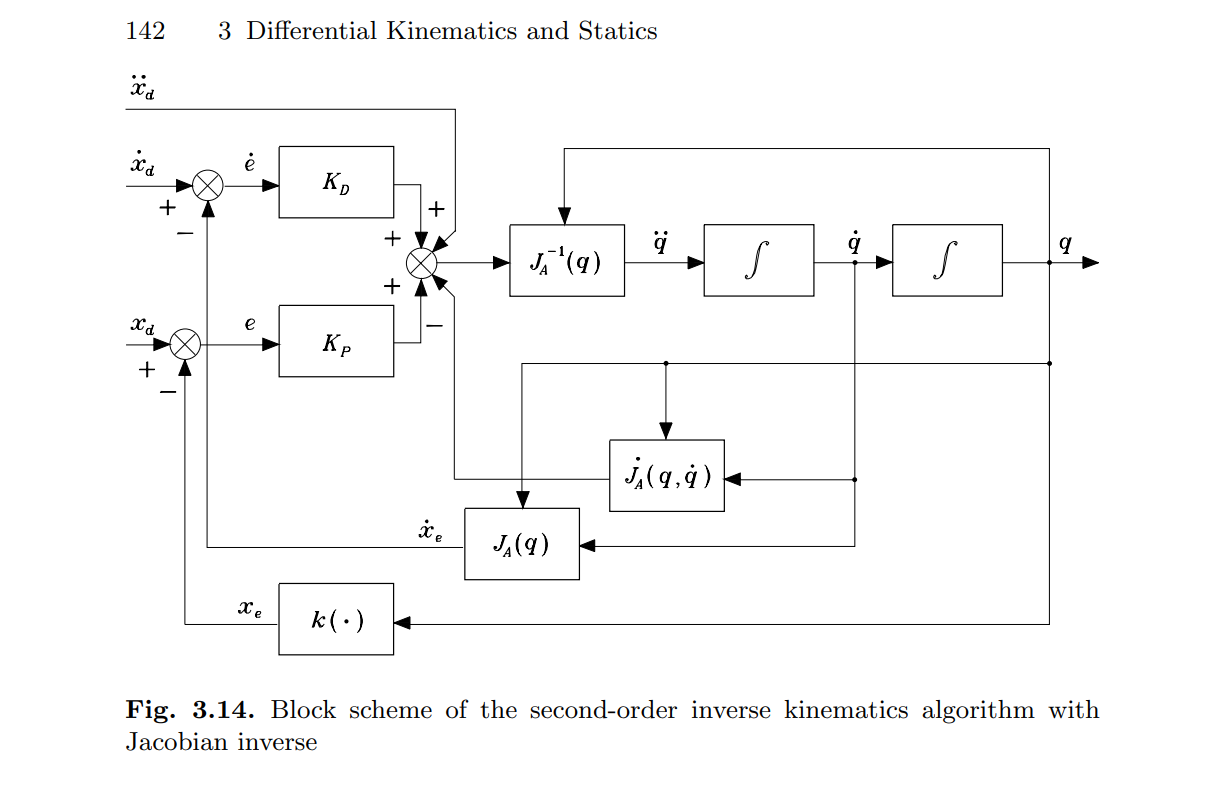
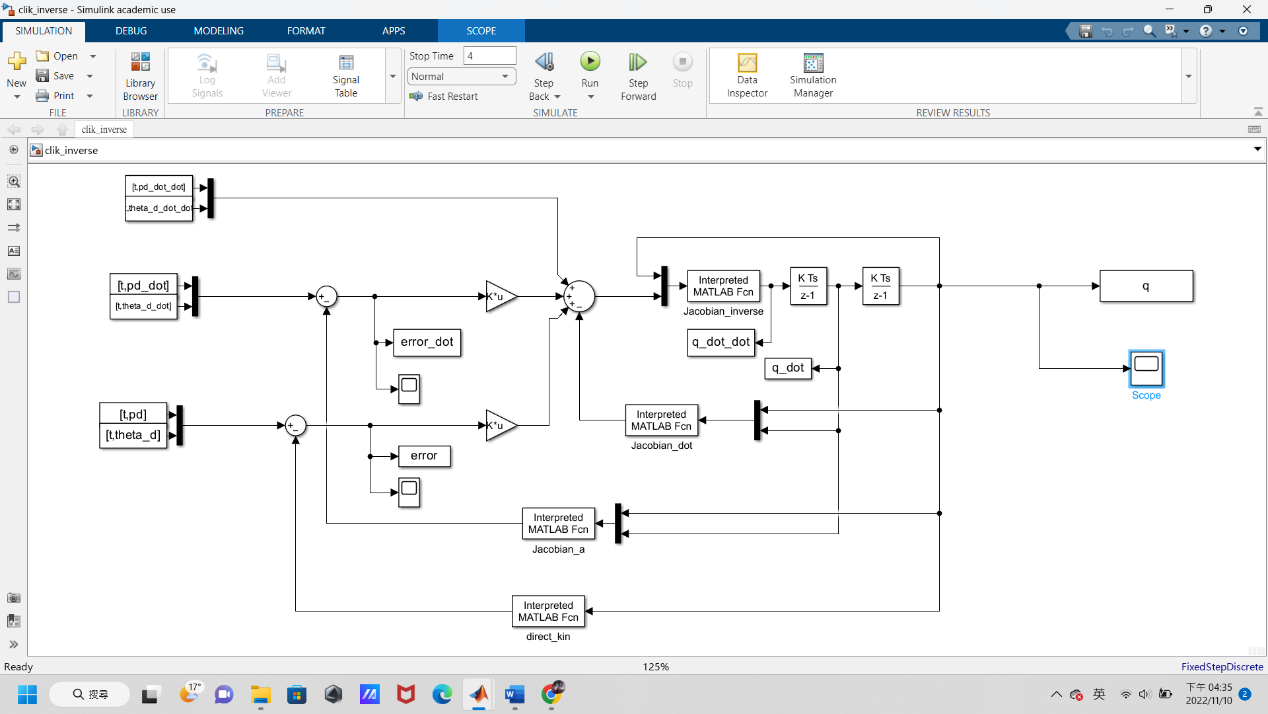
ht2383 N15040025 Hua Wen, Tsuei

Project2 report

Part1:

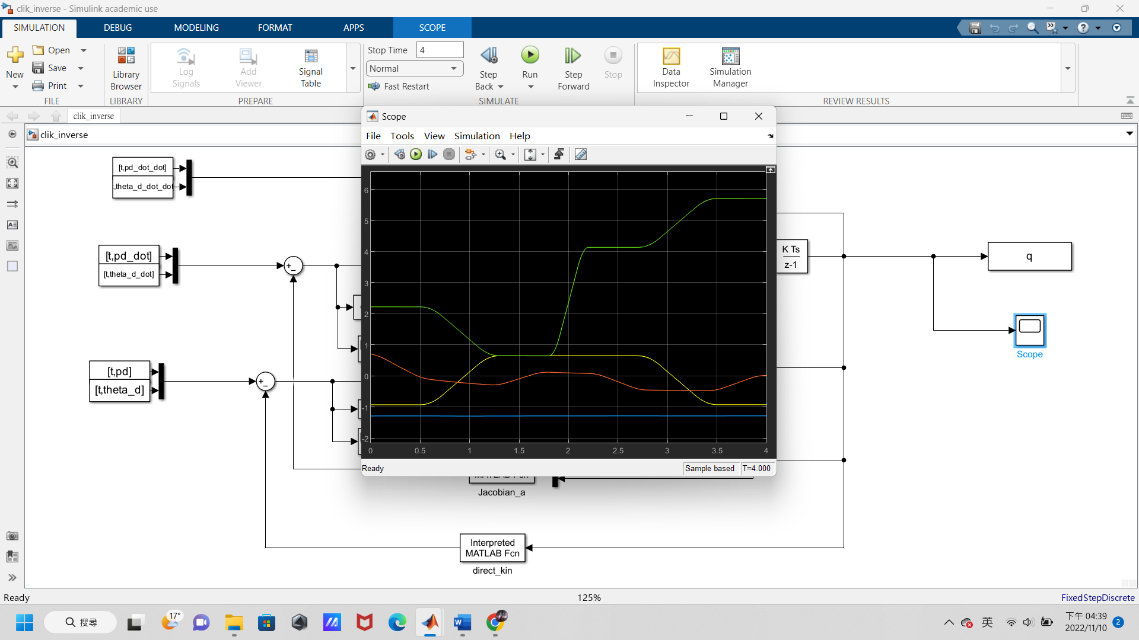


According to the scheme on textbook, I draw the same structure on matlab using Simulink.(run the init.m file)

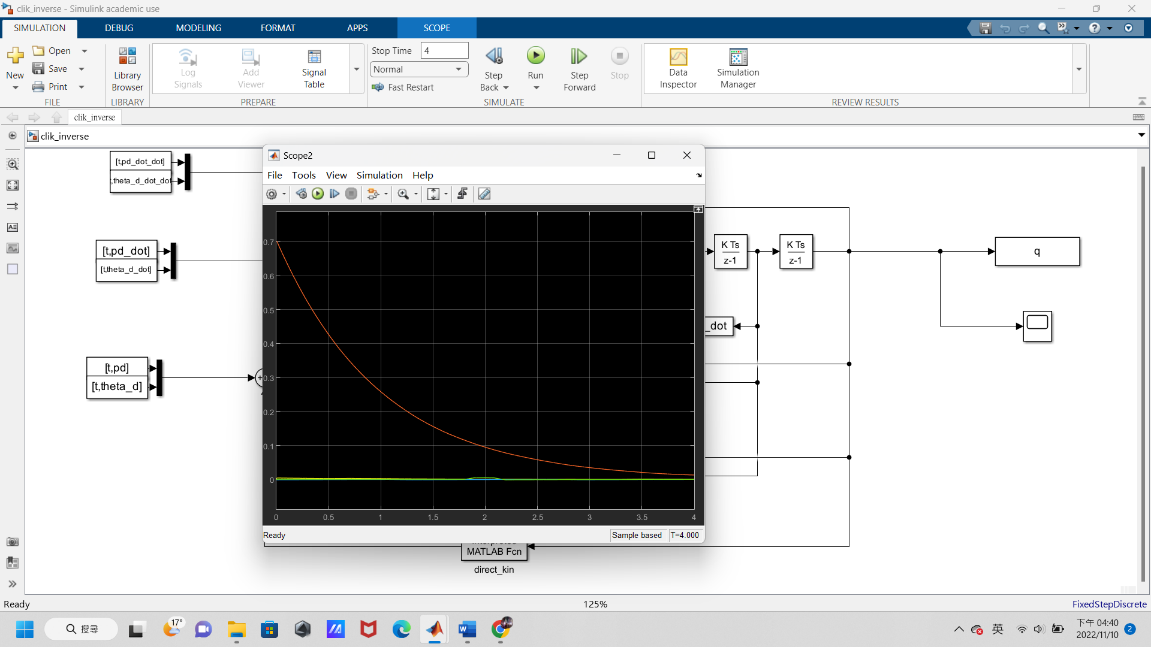
For KD KP I set them both 300.

Put scope on e, e\_dot & q to observe

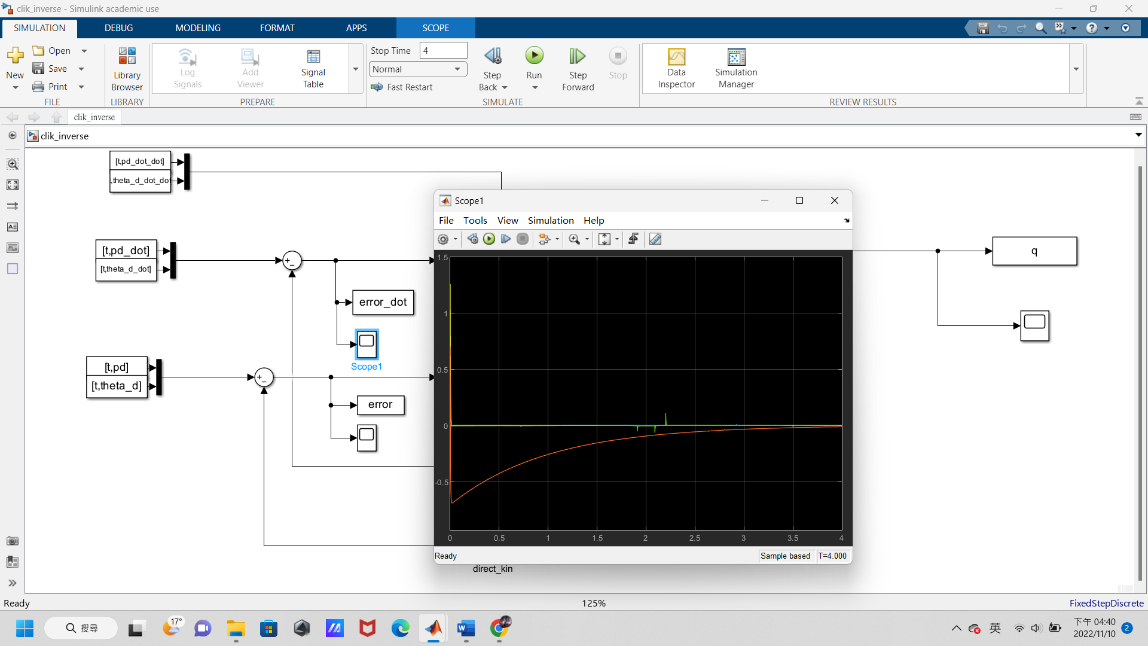
the scope of q:



the scope of error:



the scope of error\_dot:



Analytic Jacobian:

-a1\*sin(th1)-a2\*sin(th1+th2) -a2\*sin(th1+th2) 0 0

a1\*cos(th1)+a2\*cos(th1+th2) a2\*cos(th1+th2) 0 0

0 0 -1 0

1 1 0 -1

Jacobian inverse:

-a1\*sin(th1)-a2\*sin(th1+th2) -a2\*sin(th1+th2) 0 0

a1\*cos(th1)+a2\*cos(th1+th2) a2\*cos(th1+th2) 0 0

0 0 -1 0

1 1 0 -1

Jacobian dot:

-a1\*sin(th1)-a2\*sin(th1+th2) -a2\*sin(th1+th2) 0 0

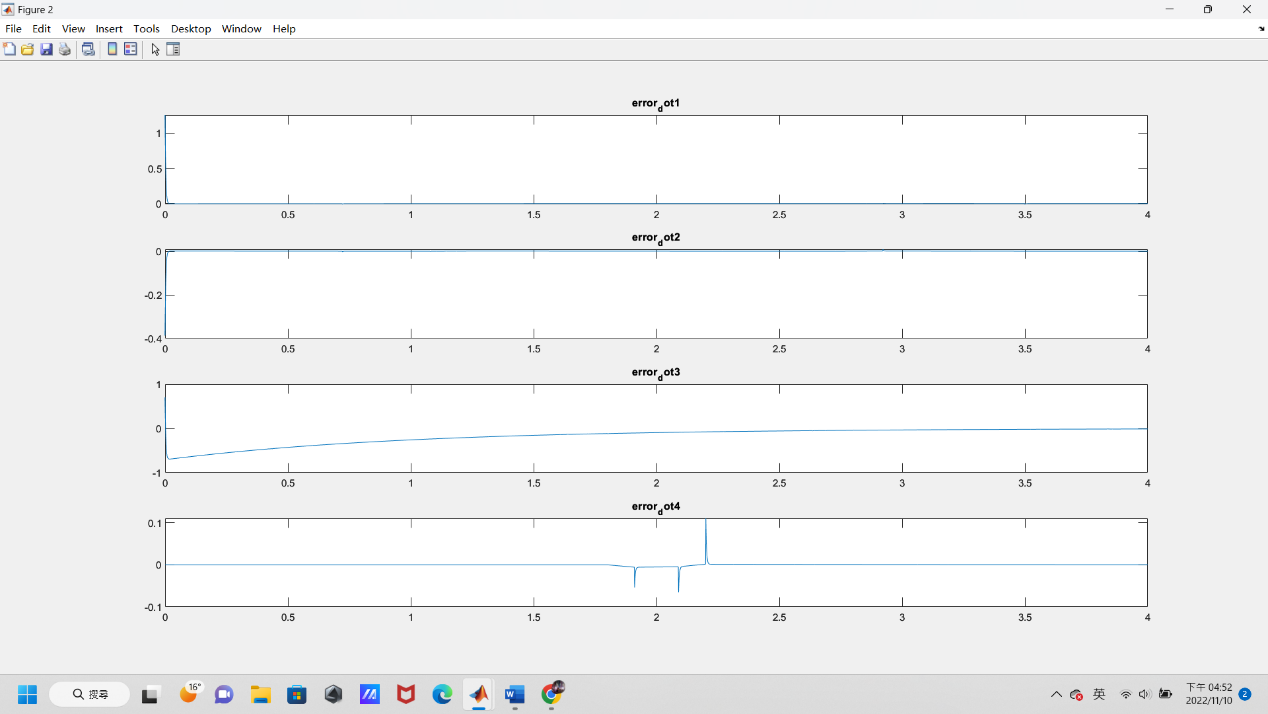
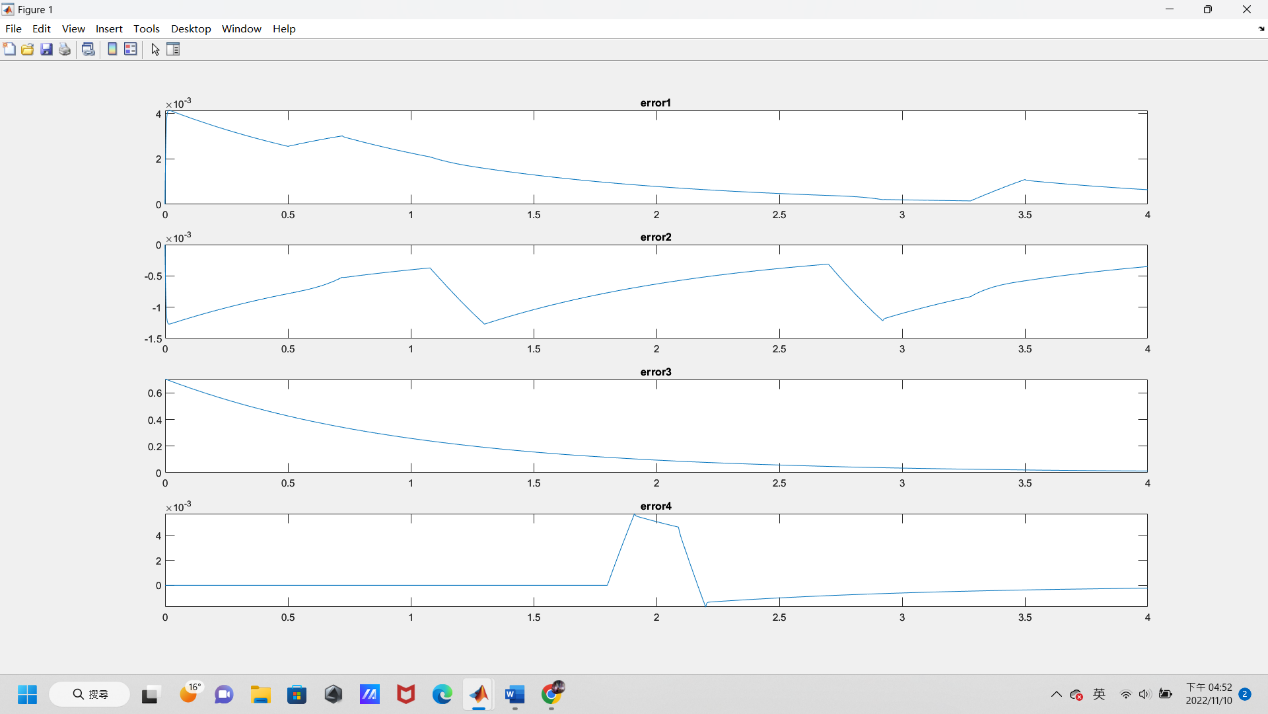
a1\*cos(th1)+a2\*cos(th1+th2) a2\*cos(th1+th2) 0 0

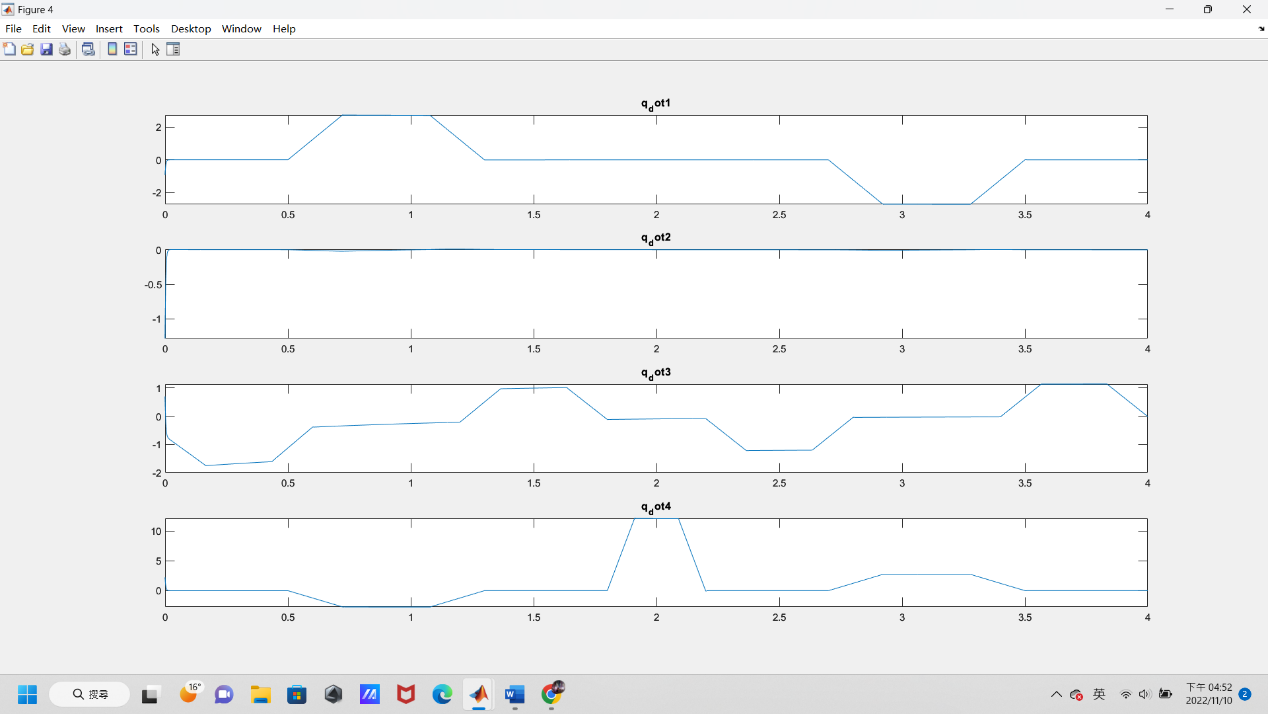
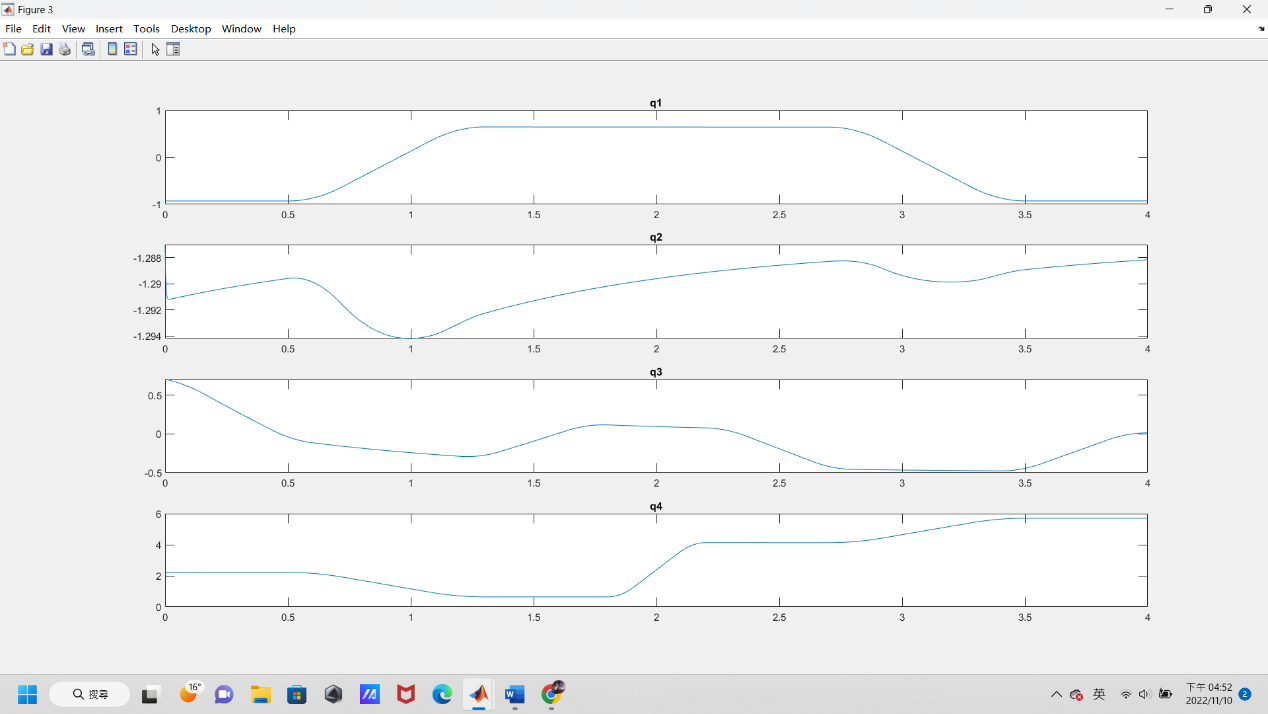
0 0 -1 0

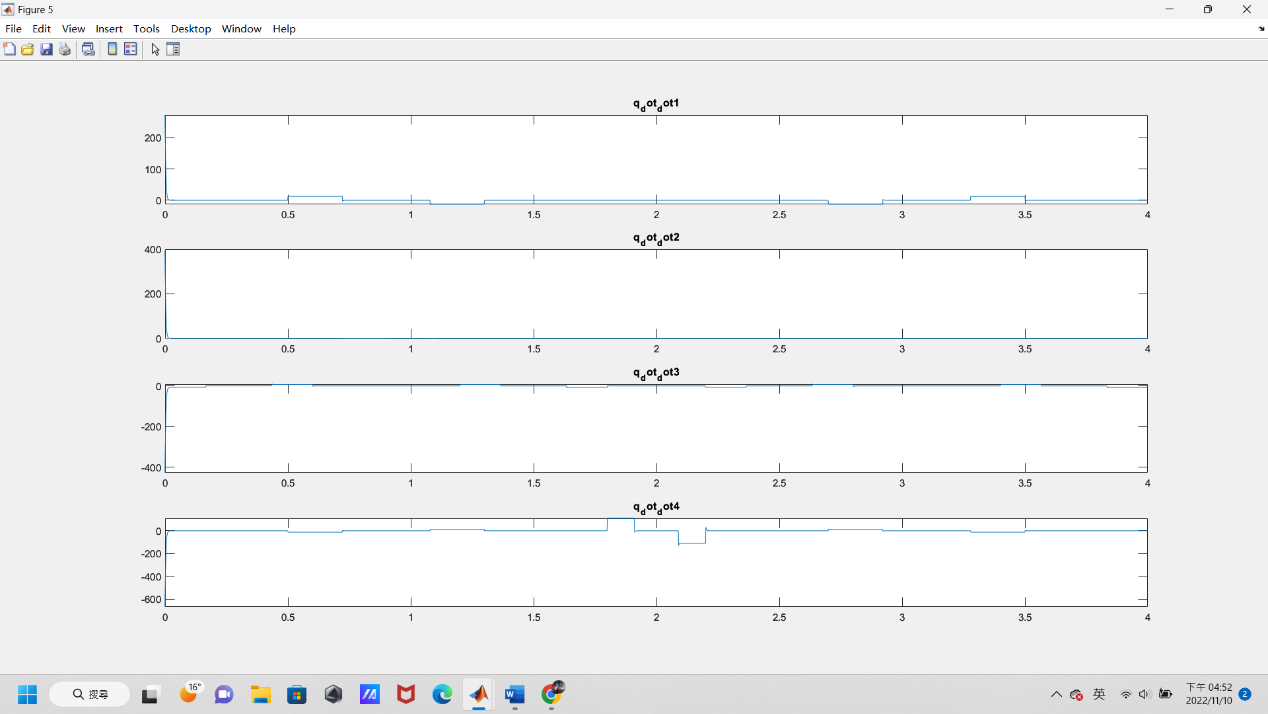
1 1 0 -1

If you run the plot\_output.m file you will get all the Joint value and Operational space Error.

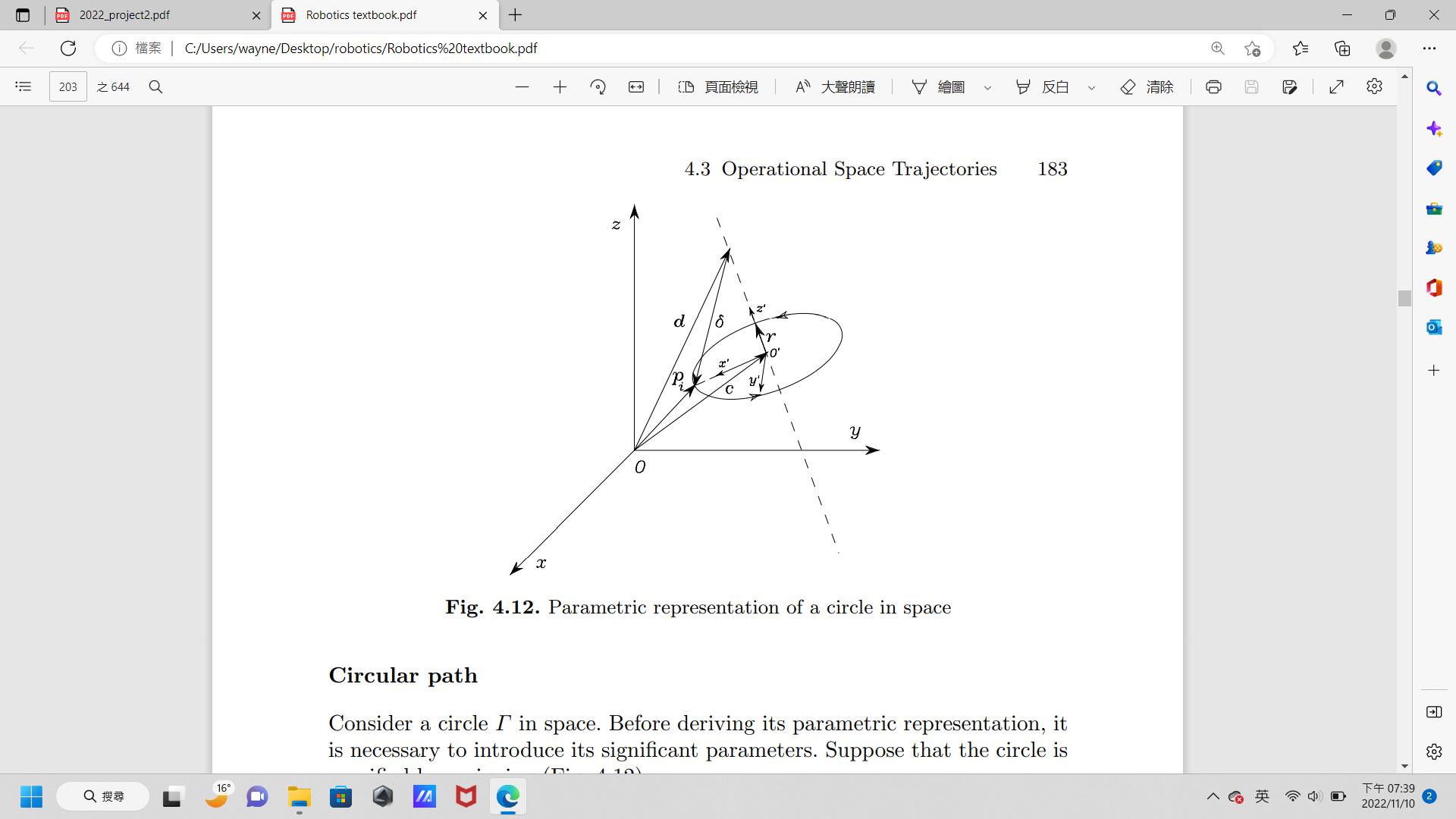
Operational space Error:

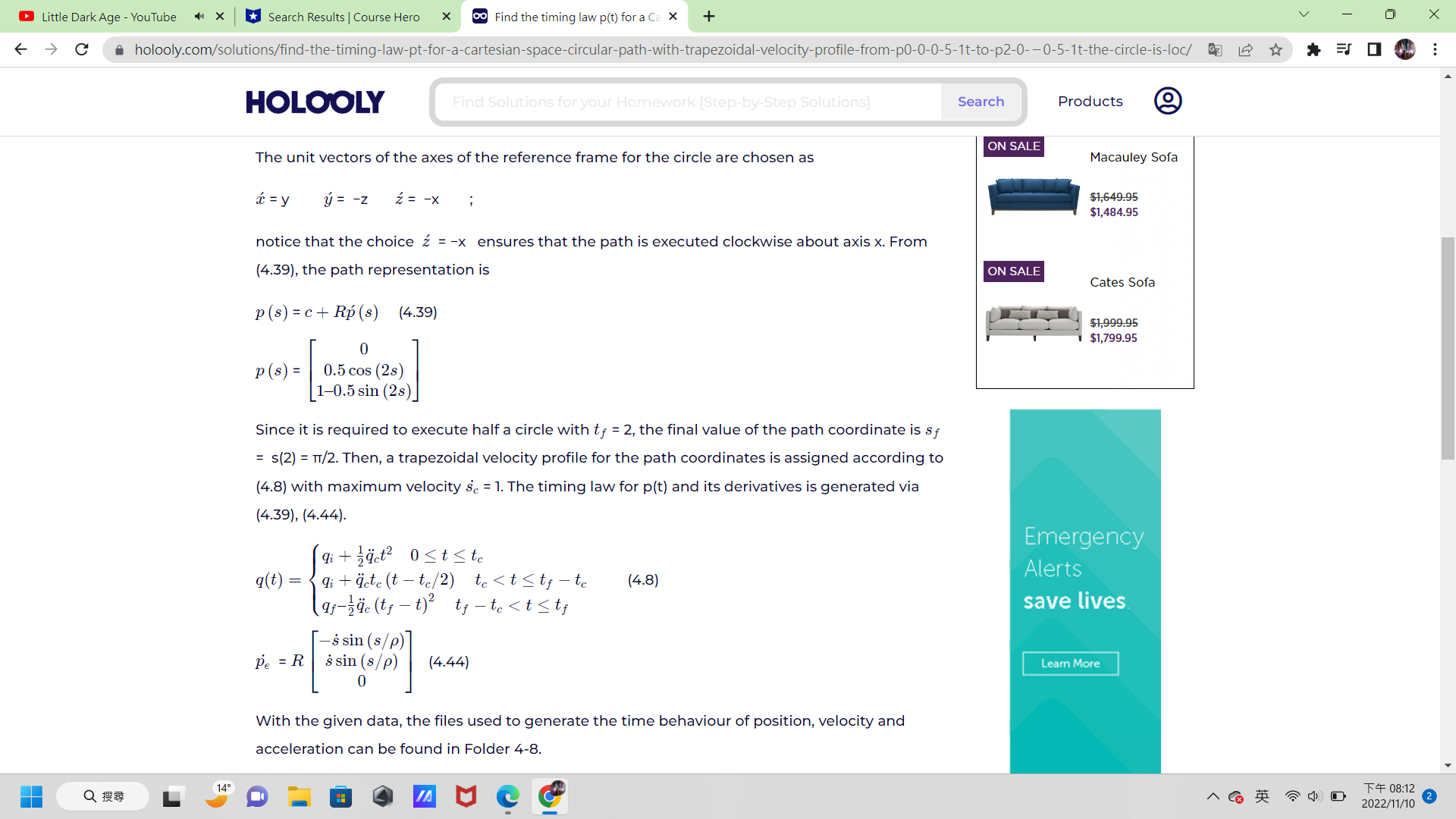


Joint value:



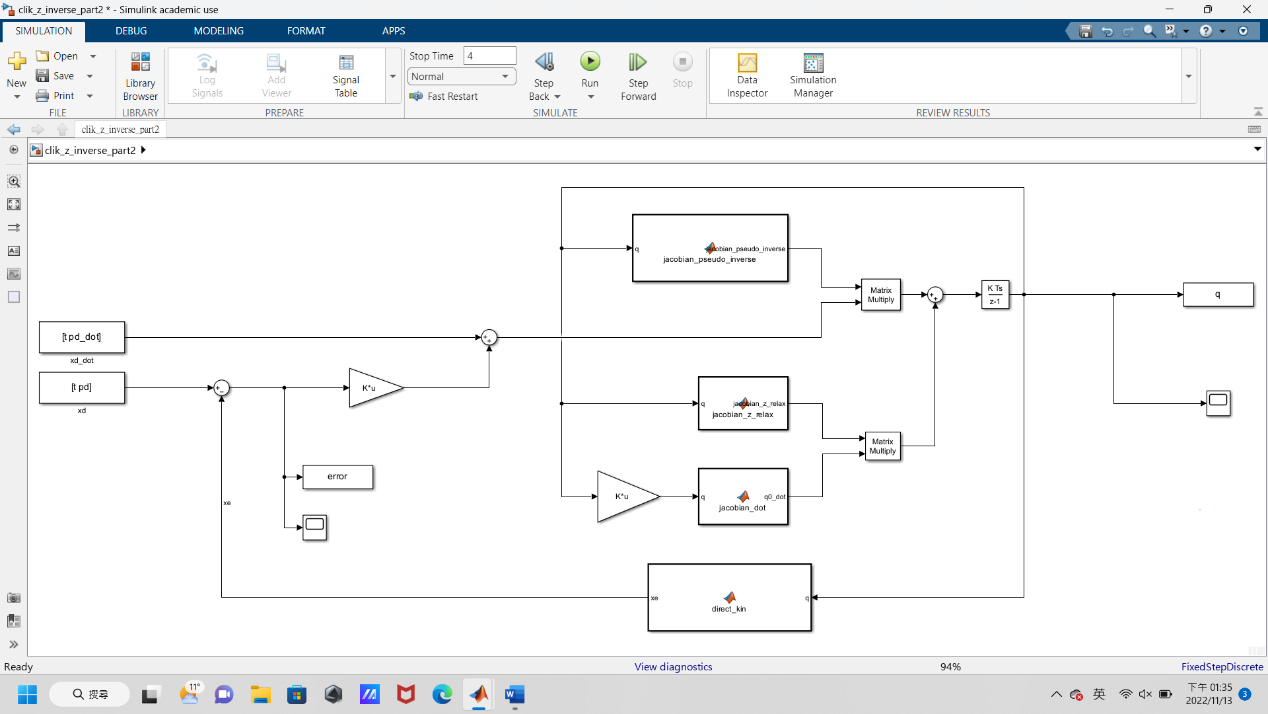
Part2:



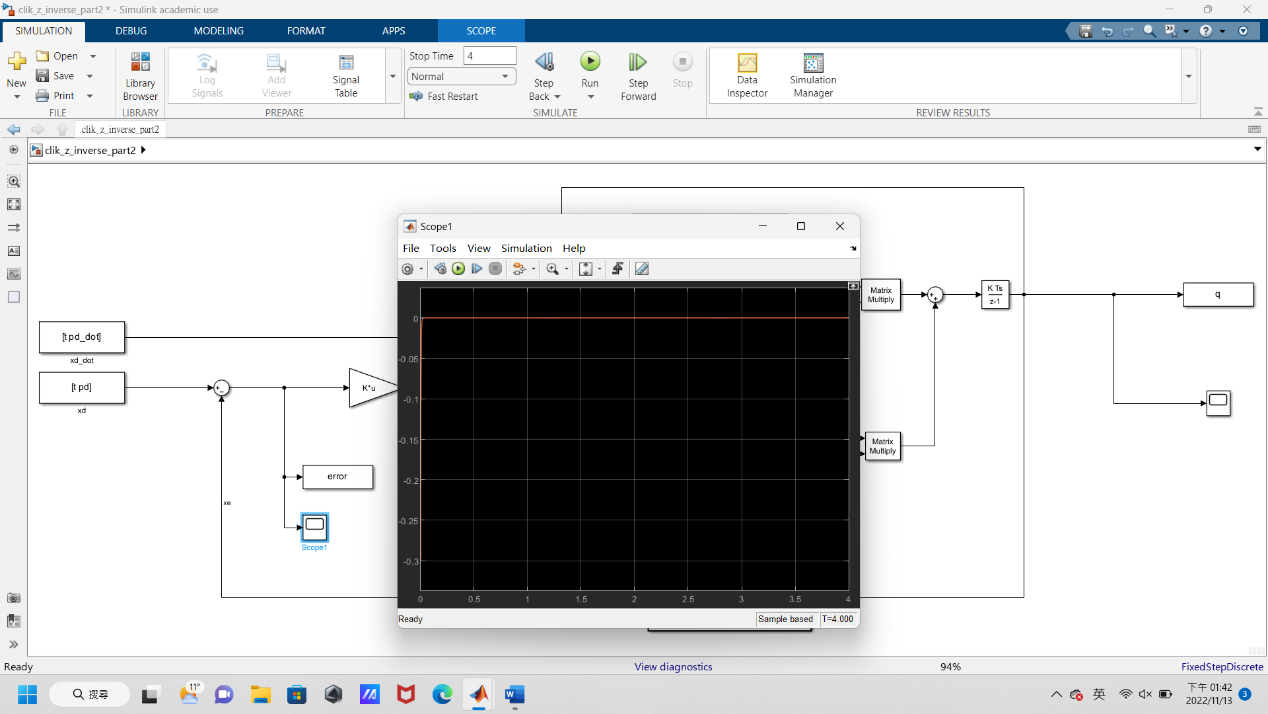


There should only have 3 rows in jacobian pseudo-inverse is given by:

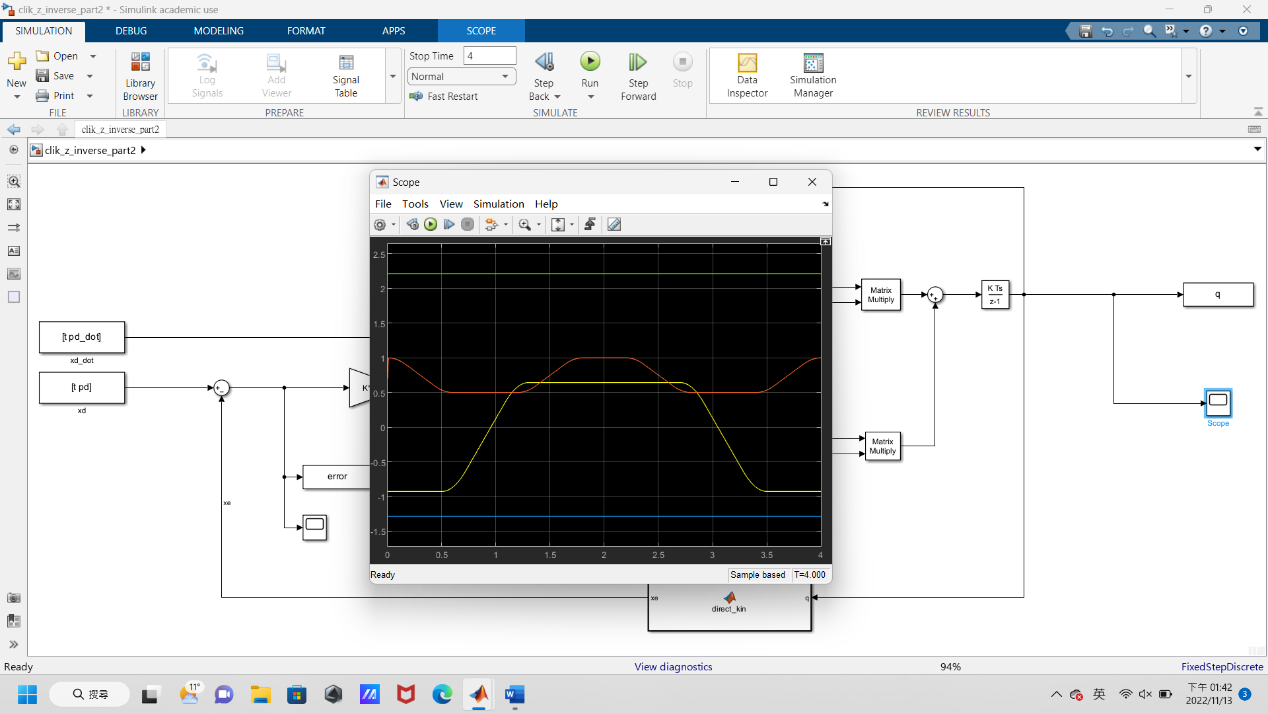
according to the equation I think the Simulink scheme should look like below, this time I write my code inside Simulink function:



From the scope we can get error:



and q:



To get the Joint variables and errors in the operational space(please run the plot\_output.m file):

Figure1: for theta1 theta2 d3 theta4

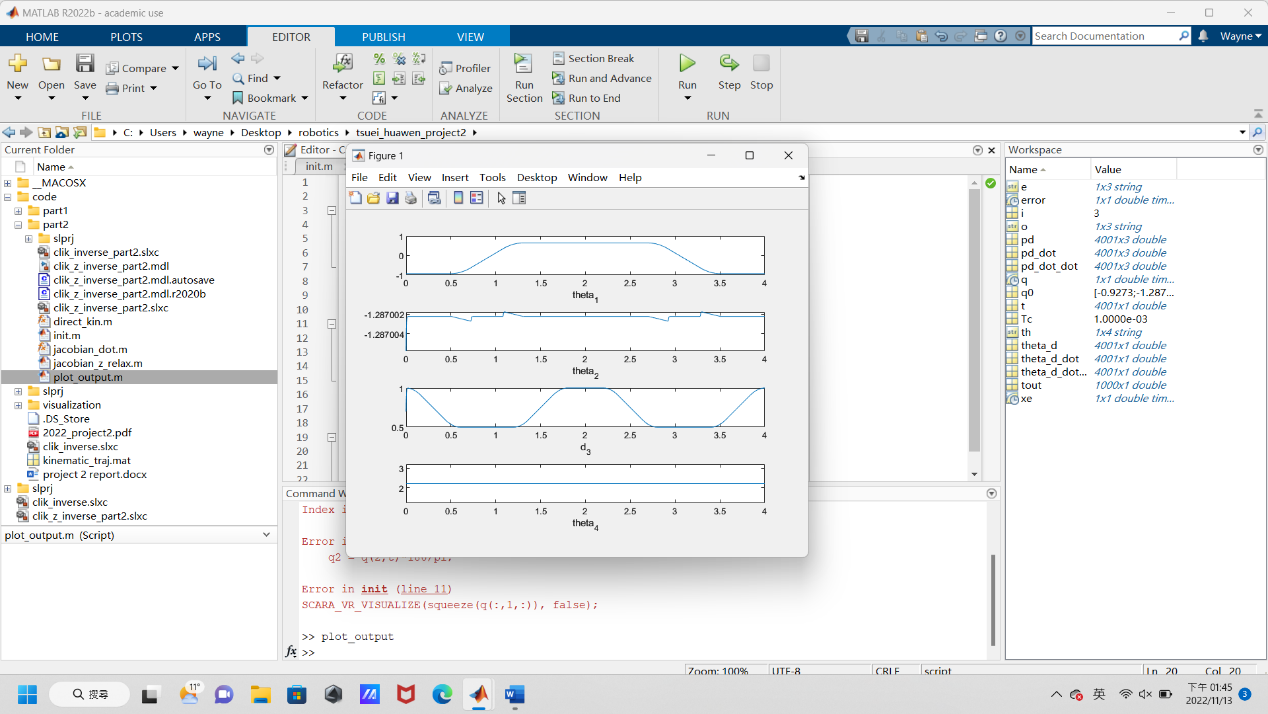


Figure2: for the error

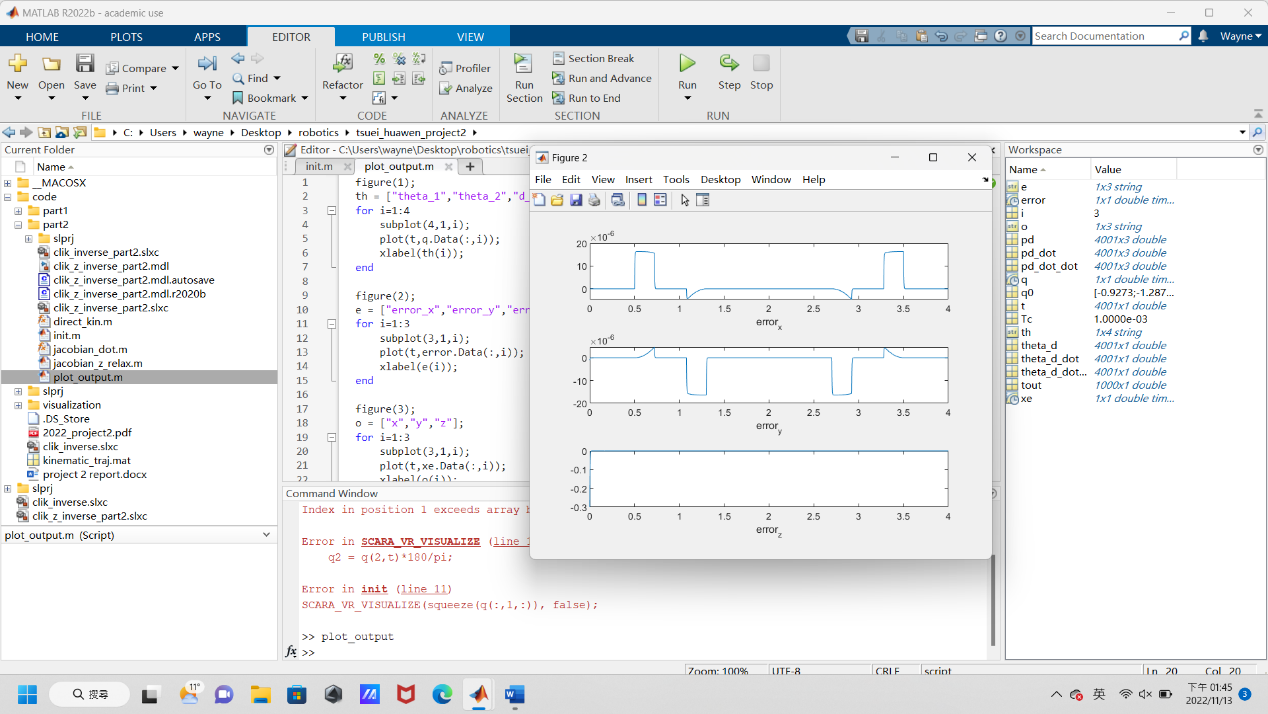


Figure3: for x y z

