**Computed Torque Controller**

The computed torque controller is appplied to a two-docked holonomic mobile robot. The controller is designed such that the leader tracks spline function. The wheels’ input torques are calculated using follwing formulation:

The equation of the motion of the robots

So the wheels’ input torques will be

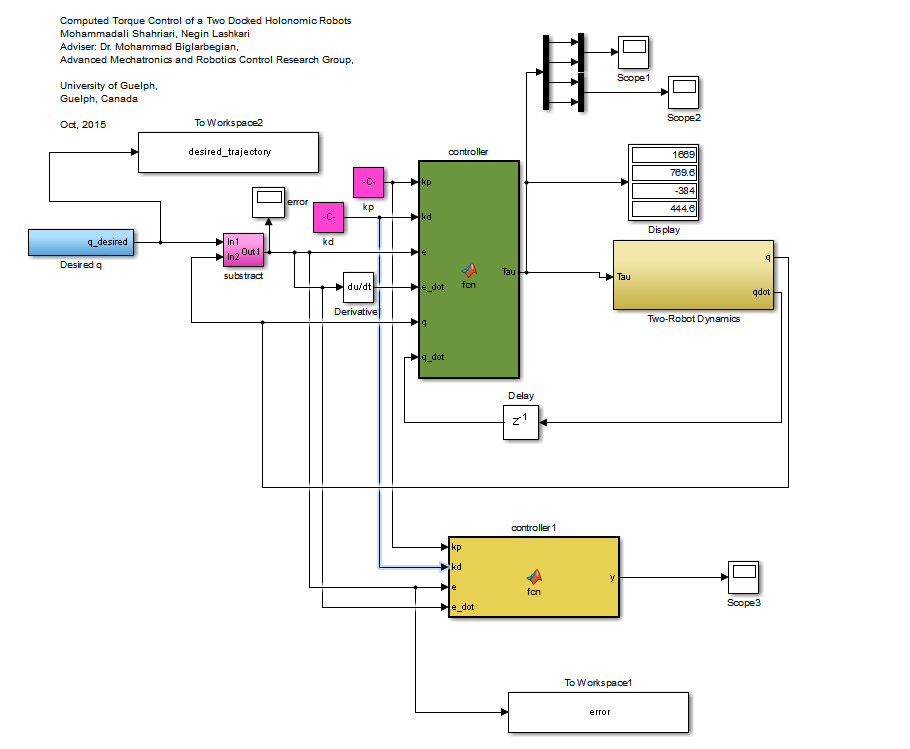
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To set up the controller, we can adjust:

1. Saturation limit of the integrator inside the two-robots’ dynamic
2. and coefficients

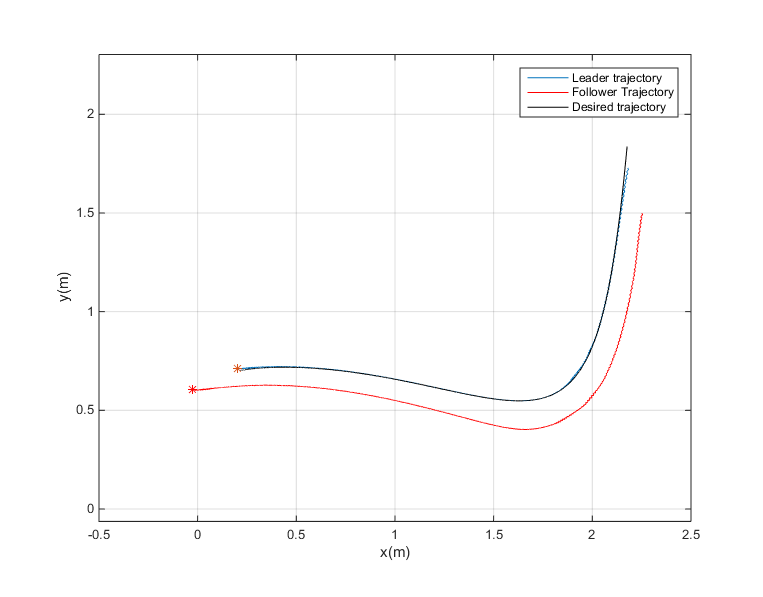
The differential solve should be done using fixed step of ode4 (Runge-kutta).

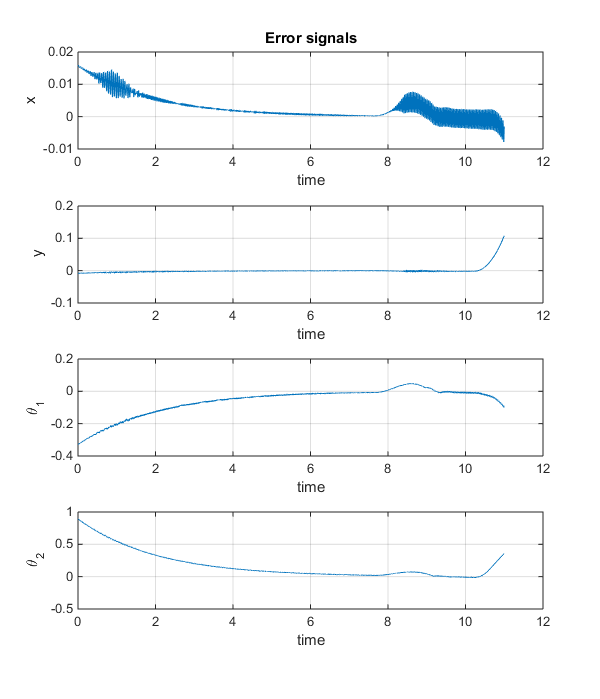
The ripple that can be seen in the figures are arising from solving the equation discretely. We can filter them out if we want to cancel them.





**Case 1:** For a 5th order polynomial function:





***Integration initial condition:*** [0.2;0.71;pi/6;pi/9;0;0;0;0]

***Upper saturation limit:*** [inf,inf,inf,inf,2,2,2,2]\*0.3

***Lower saturation limit:*** -[inf,inf,inf,inf,2,2,2,2]\*0.3

For a 3rd order polynomial function: