Computed Torque Control of a Two Docked Holonomic Robots
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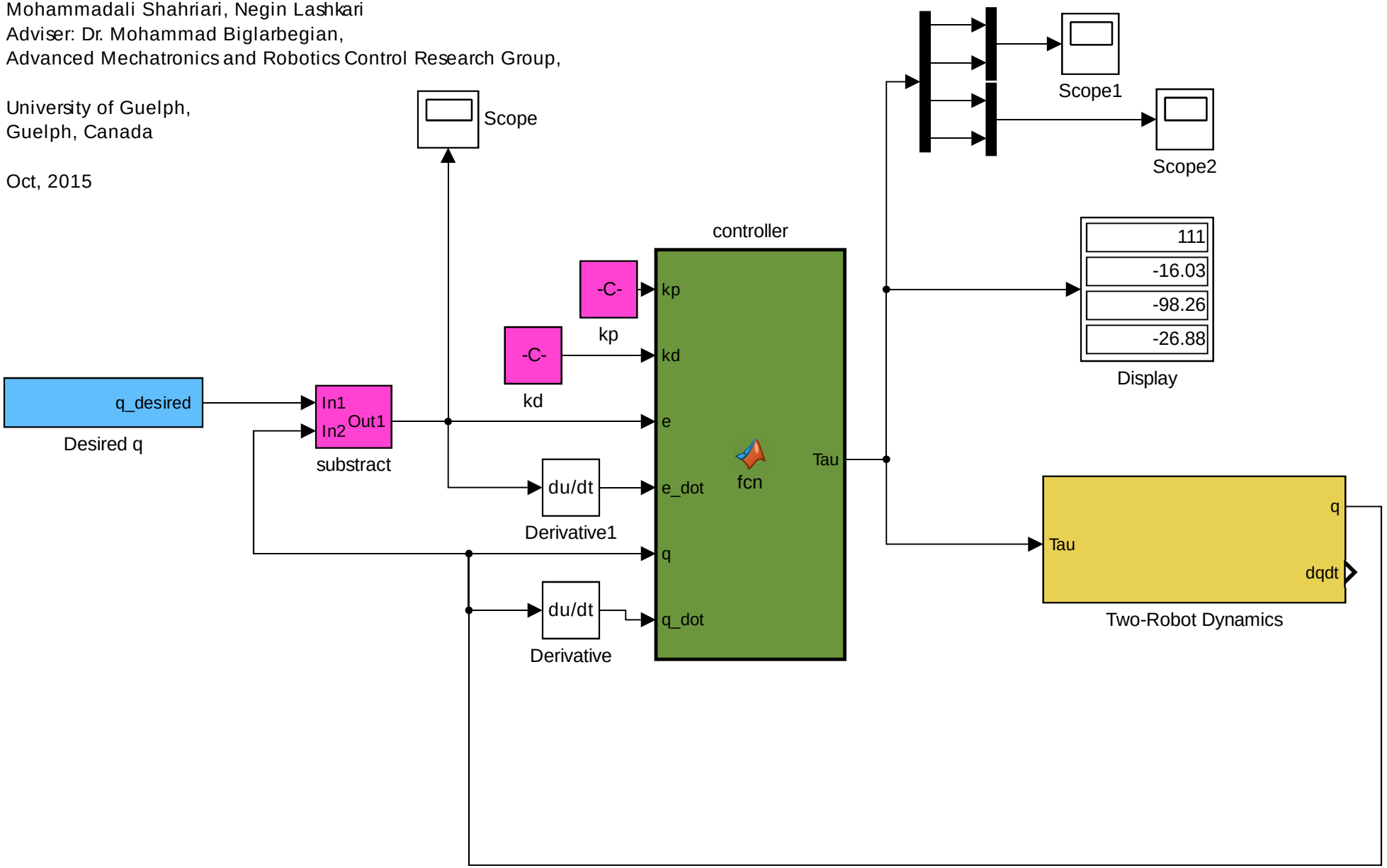
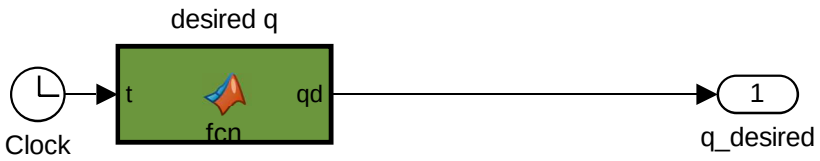
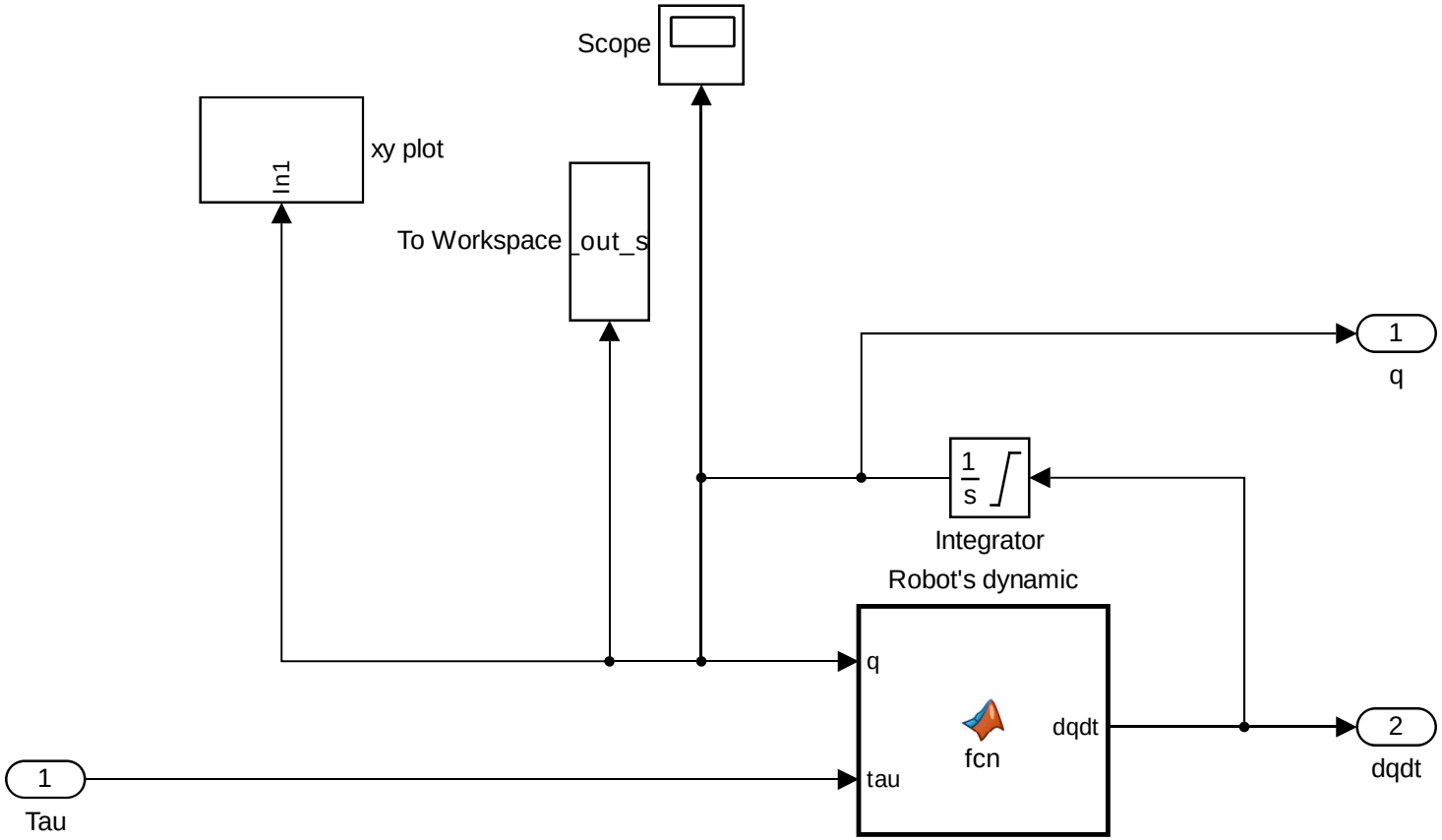
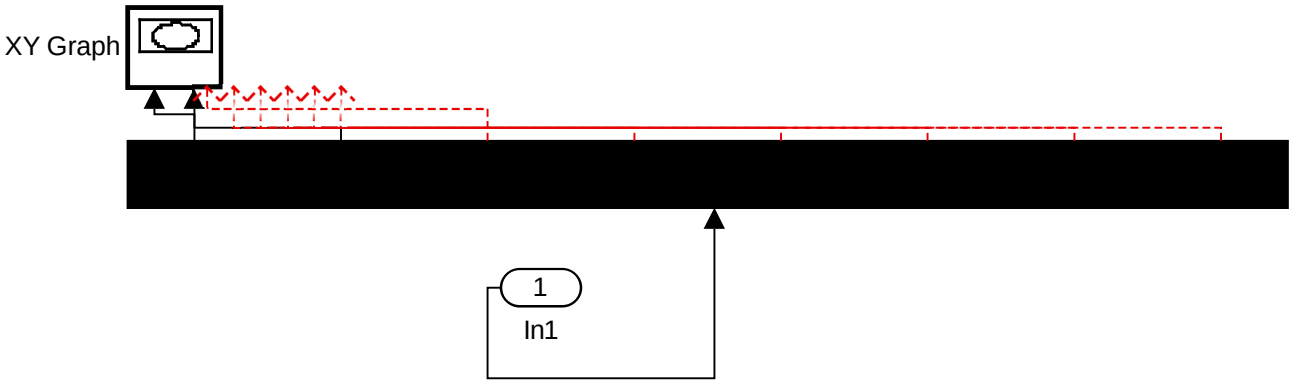



desired q
t
qd
fcn
Clock
1
q_desired

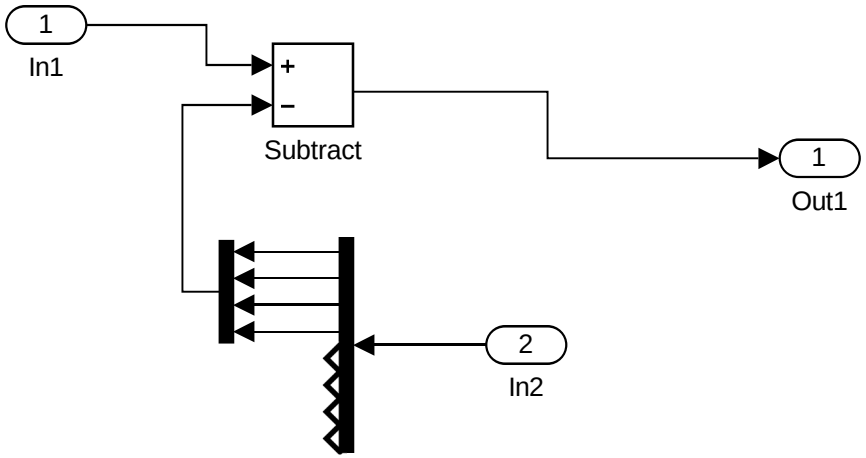
```
function qd= fcn(t)
qd=q_desired(t);
```


Scope
In1
xy plot
To Workspace
_out_s
1
q
1
s
Integrator
Robot's dynamic
q
tau
fcn
dqdt
2
dqdt
1
Tau

```
function dqdt= fcn(q,tau)


dqdt=zeros(8,1);



% input torque:

tau_l1=tau(1);
tau_r1=tau(2);
tau_l2=tau(3);
tau_r2=tau(4);

% defining ode:

theta_1= q(3);
theta_2= q(4);
theta_dot1=q(7);
theta_dot2=q(8);



qdoubledot=Qdotdot(tau_l1,tau_l2,tau_r1,tau_r2,theta_1,theta_2,theta_dot1,theta_dot2);



dqdt(1)=q(5);
dqdt(2)=q(6);
dqdt(3)=q(7);
dqdt(4)=q(8);
dqdt(5)=qdoubledot(1);
dqdt(6)=qdoubledot(2);
dqdt(7)=qdoubledot(3);
dqdt(8)=qdoubledot(4);

end
```


XY Graph
1
In1

```
function Tau= fcn(kp,kd,e,e_dot,q,q_dot)

theta_1= q(3);
theta_2= q(4);

theta_dot1=q(7);
theta_dot2=q(8);

x_dotdot=q_dot(5);
y_dotdot=q_dot(6);
theta_dotdot1=q_dot(7);
theta_dotdot2=q_dot(8);

% to avoid singularity on the docked mechanism:

if abs(theta_1-theta_2)<1e-2
    if theta_dot2>=0
     theta_2=theta_1+0.01;
    else
     theta_2=theta_1-0.01;
    end
end

%-------------------------------------------

Tau=Tau_computed(theta_1,theta_2,theta_dot1,theta_dot2,theta_dotdot1,theta_dotdot2,x_dotdot,y_dotdot);
Tau=Tau+B_inverse(theta_1,theta_2)*(kp*e+kd*e_dot);
```


1
In1
+
−
Subtract
1
Out1
2
In2