```
% Choose directory
rootdir = ['D0810B2F4--/run1','D0810B2F4--/run2','D0810B2F4--/run3'];
%Load Data

for a=1:16:48
    DesiredEndEffectorVelocity = load(fullfile(rootdir(a:a
+15),"desiredEndEffectorVelocity.csv"));
    DesiredJointPosition = load(fullfile(rootdir(a:a
+15),"desiredJointPosition.csv"));
    JointPosition = load(fullfile(rootdir(a:a+15),"jointPosition.csv"));
    Time = load(fullfile(rootdir(a:a+15),"simulationTime.csv"));
    x = zeros(length(Time),3);
    xDot = zeros(length(Time)-1,3);

    for i =1:length(Time)
        [x(i,:), ~] = forwardKinematics(JointPosition(i,:));
    end
    for i =1:length(x)-1
        xDot(i,:) =  (x(i+1,:) - x(i,:)) / (Time(i+1)-Time(i));
    end

    % Desired Path and Derivative of Path
    radius = 0.08;
    line_length = 0.1;
    alpha = (2*line_length)/(radius*pi) + 1;

    % Time vector
    sspace = linspace(0, alpha + 1, length(Time));  % Generate 100 points
 within the total time

    P_z = zeros(1,length(sspace));
    P_x = zeros(1,length(sspace));
    P_z_derivative = zeros(1,length(sspace));
    P_x_derivative = zeros(1,length(sspace));

    for i=1:length(sspace)
        s=sspace(i);
        if s <= 1
            % Calculate x and y coordinates of the first circle segment
            P_z(i) = -radius * cos(s*pi/2);
            P_x(i) = -radius * sin(s*pi/2);

            P_z_derivative(i) = radius * (pi/2) * sin(s * pi/2);
            P_x_derivative(i) = -radius * (pi/2) * cos(s * pi/2);

        elseif s <= alpha && s>1
            % Calculate the coordinates of the straight line segment
            P_z(i) = (s-1) * (radius * pi) / 2;
            P_x(i) = -radius * ones(1);

            P_z_derivative(1,i) = radius * pi / 2;
            P_x_derivative(1,i) = 0;
```

```
        else
            P_z(i) = radius * sin((s-alpha) * pi/2) + line_length;
            P_x(i) = -radius * cos((s-alpha) * pi/2);
            P_z_derivative(i) = radius * pi/2 * cos((s-alpha) * pi/2);
            P_x_derivative(i) = radius * pi/2 * sin((s-alpha) * pi/2);
        end

    end


    % Plotting
    figure(1)
    hold on;   grid on
    plot(x(:,3),-x(:,1),'.')
    if a == 33
        plot(P_z + 0.515509+radius,P_x + 0.0210774,'LineWidth',1.5)
    end
    xlabel('z direction (m)');    ylabel('x direction (m)')
    title('Desired and Actual Position')
    legend('Actual Path1', 'Actual Path2', 'Actual Path3','Desired Path' )
    axis('equal');

    figure(2)
    hold on;    grid on
    plot(Time(10:end-1),xDot(10:end,1),'.')
    if a == 33
        plot(Time,DesiredEndEffectorVelocity(:,1),'LineWidth',1.5)
    end
    xlabel('Time (s)');    ylabel('Velocity (m/s)')
    title('Velocity in X direction')
    legend('Actual Velocity1','Actual Velocity2','Actual Velocity3','Desired
 Velocity')

    figure(3)
    hold on;    grid on
    plot(Time(10:end-1),xDot(10:end,3),'.')
    if a==33
        plot(Time,DesiredEndEffectorVelocity(:,3),'LineWidth',1.5)
    end
    xlabel('Time (s)');    ylabel('Velocity (m/s)')
    title('Velocity in Z direction')
    legend('Actual Velocity1','Actual Velocity2','Actual Velocity3','Desired
 velocity')

end
```

```
Warning: Ignoring extra legend entries.
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Warning: Ignoring extra legend entries.
```
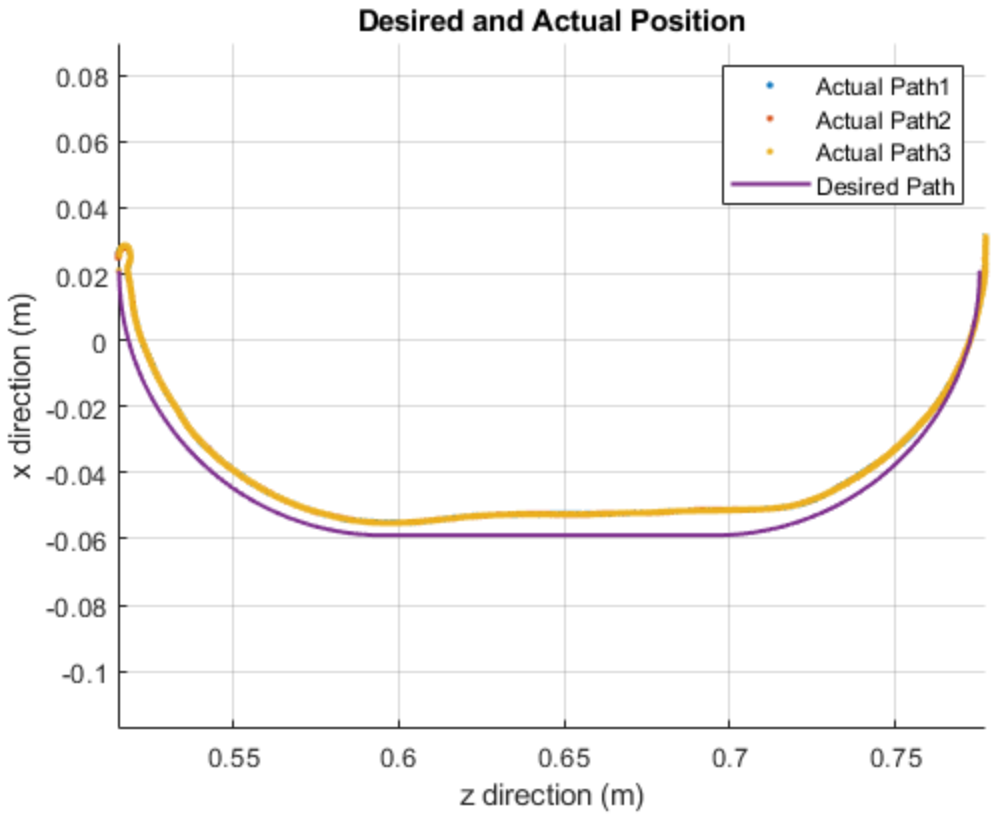
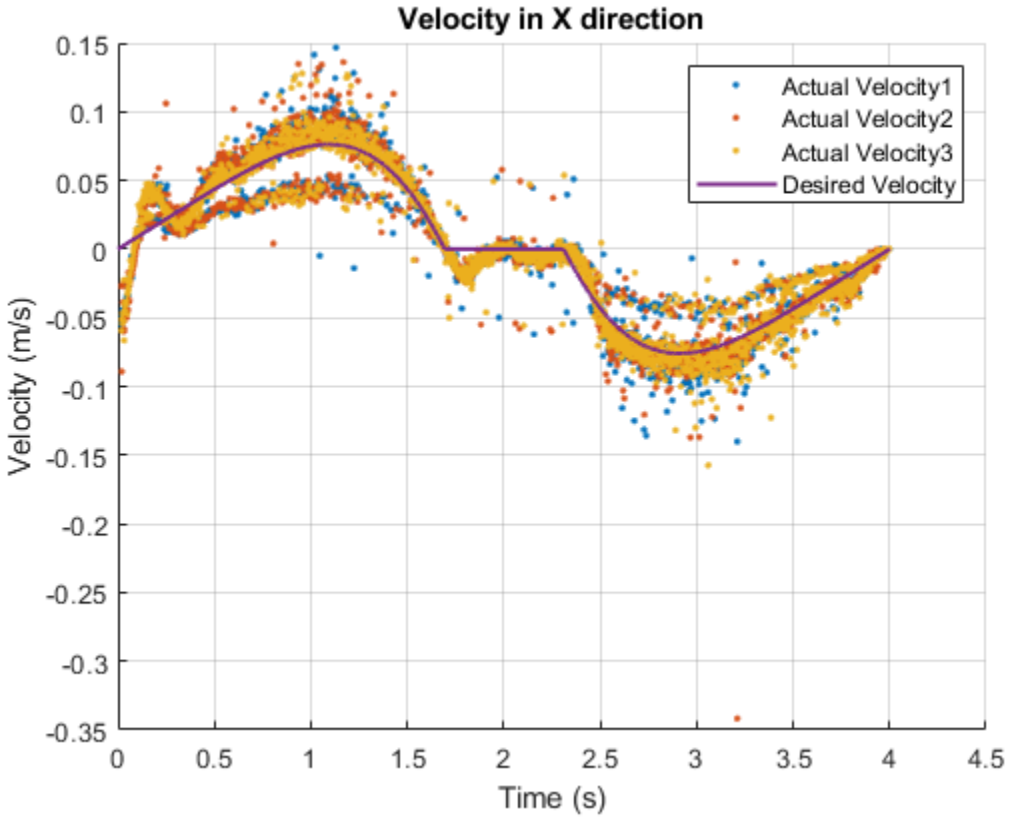
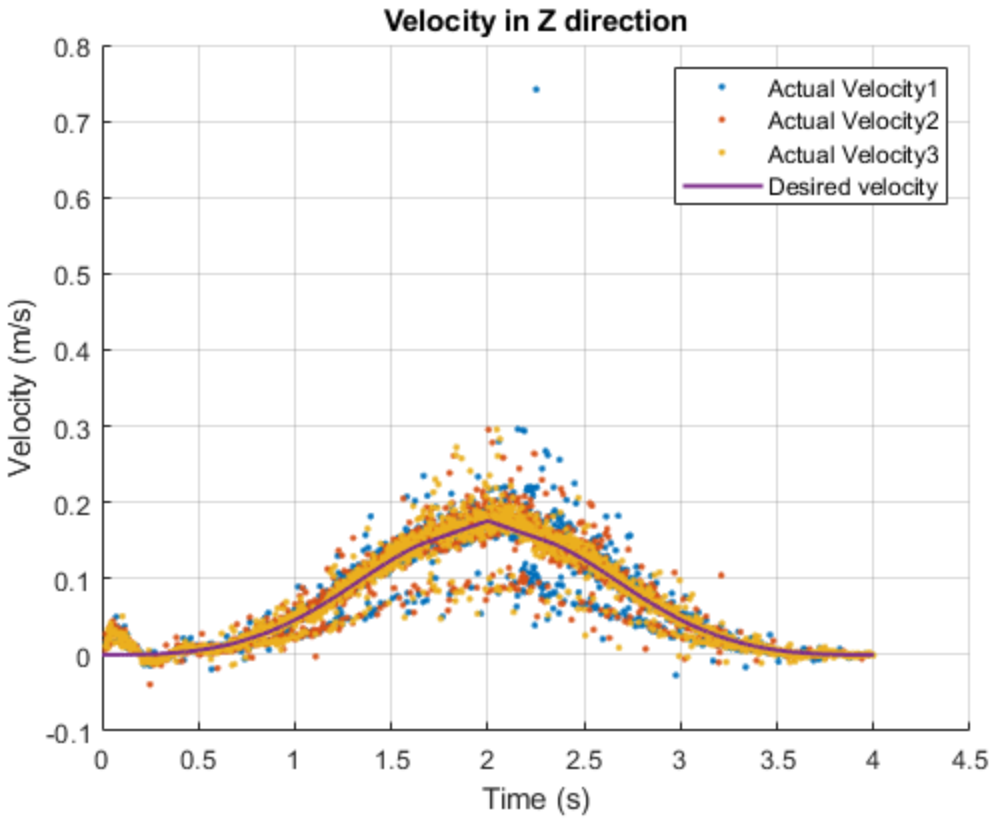


Desired and Actual Position
Actual Path1
Actual Path2
Actual Path3
Desired Path
x direction (m)
z direction (m)
0.08
0.06
0.04
0.02
0
-0.02
-0.04
-0.06
-0.08
-0.1
0.55
0.6
0.65
0.7
0.75


Velocity in X direction
Actual Velocity1
Actual Velocity2
Actual Velocity3
Desired Velocity
Velocity (m/s)
Time (s)
0.15
0.1
0.05
0
-0.05
-0.1
-0.15
-0.2
-0.25
-0.3
-0.35
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5



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