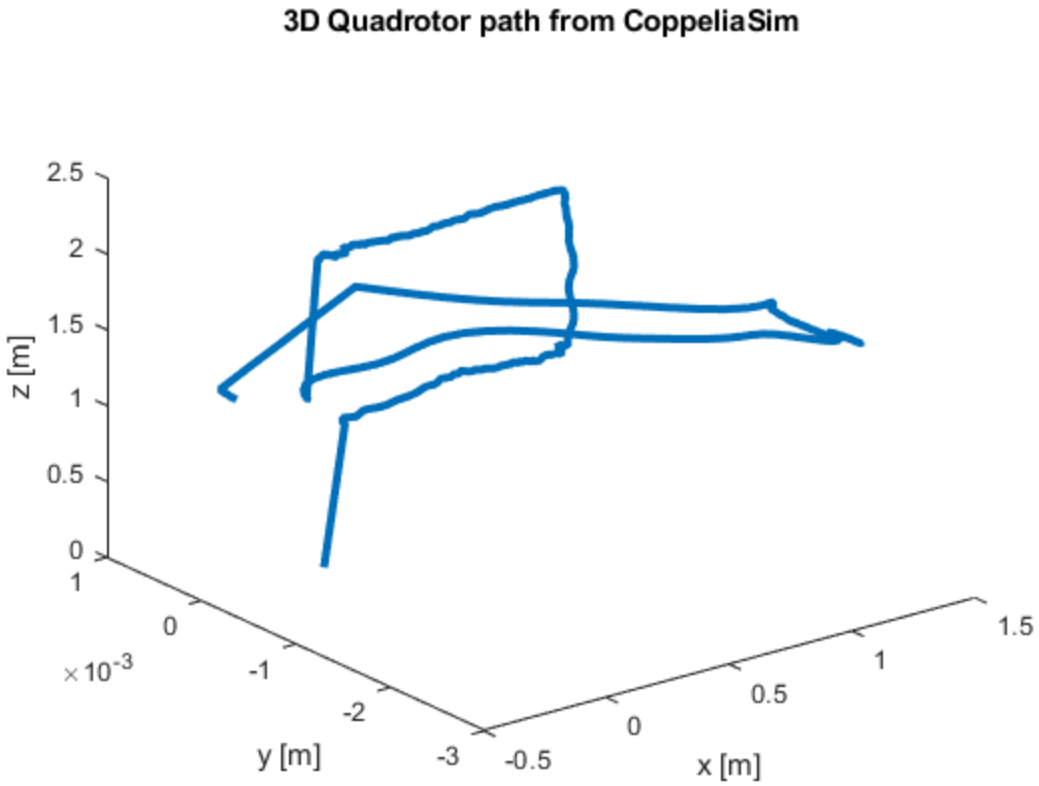
```
% Clear the workspace
clc
clear all
close all
addpath("Api")

% Initialize Communication with CopelliaSim
[ret_status, sim, clientID] = initializeComm();

% Make sure that initialization is succesful
if (ret_status == 0)
    % Collect all the variables

    [returnCode, Quad] = getObjectReference(sim, clientID, 'Quadricopter');
    % Reference the 'Quadcopter_target' object in CoppeliaSim as 'target' in
 MATLAB
    [returnCode, target] = getObjectReference(sim,
 clientID, 'Quadricopter_target');
    % Return Quad's position as quad_pos
    [returnCode, quad_pos] = getObjectPosition(sim, clientID, Quad, 1);
    % Get the position of the green sphere (target) from the copelliaSim
    [returnCode, target_position] = getObjectPosition(sim, clientID, target,
 1);


    % sphere position
    p_x_star = target_position(1);
    p_y_star = target_position(2);
    p_z_star = target_position(3);

    % Current Positions
    p_x = [];
    p_y = [];
    p_z = [];

    % Iterations
    i = 0;
    j = 0;
    k = 1;

    % seemed to need this, so they exist here first
    targX =0;
    targXinv =0;
    targZ =0;
    targZinv =0;


    % Set a tolerance bc we can't get to targets without an overshoot
    err = 0.25;

    % Add some time
    % variables for time/ when to stop sim
```

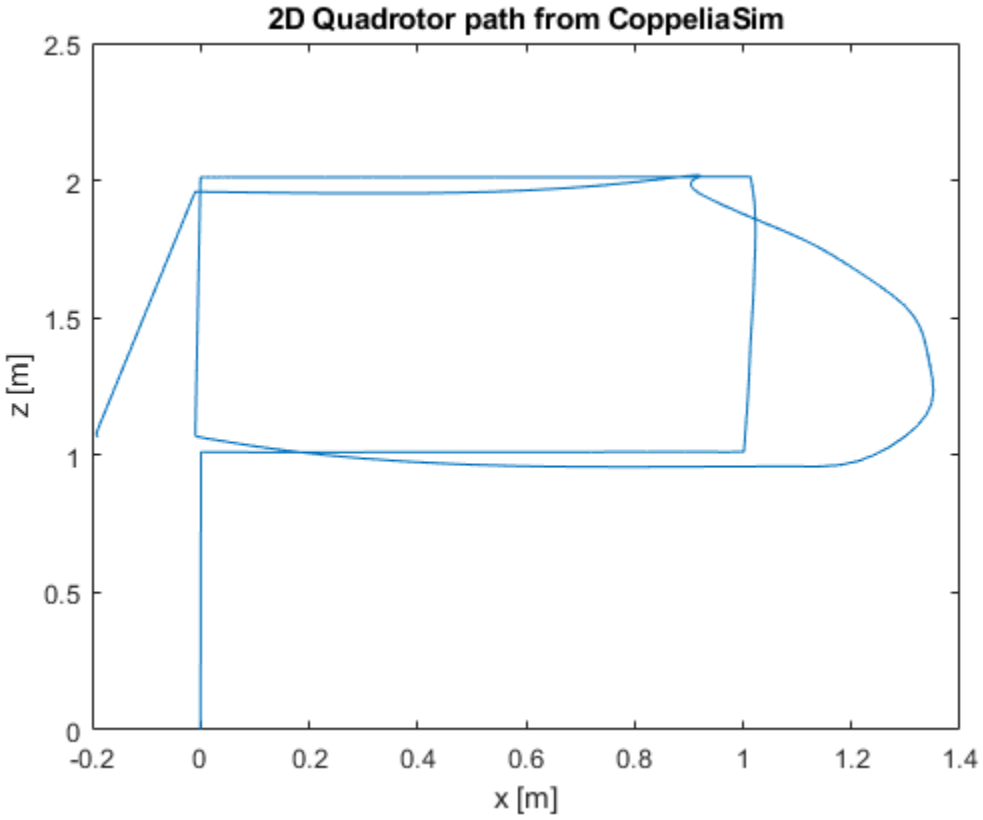
```
T = 25; % How long you want to collect the data for

t=clock;
startTime=t(6);
currentTime=t(6);

% While sim is on
while(currentTime-startTime < T)
    % if the sim is running do this
    if(sim.simxGetConnectionId(clientID) ~= -1)

    % Insert code here:
    % Collect info on position
    [returnCode, quad_pos] = getObjectPosition(sim, clientID, Quad, 0);
    p_x = [p_x; quad_pos(1)];
    p_y = [p_y; quad_pos(2)];
    p_z = [p_z; quad_pos(3)];

    % Tell Target to move, if statements in xz
    % x moves: 0 -> 1
    %  0<x<1        z = 1       y = 0
    % z moves: 1 -> 2
    %    x = 1    1<z<2         y = 0
    % x moves: 1 -> 0
    %  1>x>0        z = 2       y = 0
    % z moves: 2 -> 1
    %   x = 0     2<z<1         y = 0

    % Set constant
    p_y_star = 0;

    if(quad_pos(1) <= 1 && quad_pos(3) < 2-err)
        % px < 1.05  && pz < 2.05  at (1,0,1)
            targX    = 1+err;
            targXinv = 0;
            p_z_star = 1;
            p_x_star = i/(i+1)*targX + 1/(i+1)*targXinv;
            i = i + 0.0001;
    elseif(quad_pos(1) > 1 && quad_pos(3) < 2)
            targZ    = 2+err;
            targZinv = 1;
            p_x_star = 1;
            p_z_star = i/(i+1)*targZ + 1/(i+1)*targZinv;
            i = i + 0.0001;
    elseif(quad_pos(1) > 0 && quad_pos(3) >= 2)
            targX    = 0-err+0.01;
            targXinv = 1;
            p_z_star = 2;
            p_x_star = j/(j+1)*targX + 1/(j+1)*targXinv;
            j = j + 0.0001;
            % (0-0.25,  0,  2)
    elseif( quad_pos(1) < 0 && quad_pos(3) > 1 )
            p_x_star = 0;
            p_z_star = 1;
```

```
                % Read current time
                t = clock;
                currentTime = t(6);

                position = [p_x_star,p_y_star,p_z_star];
                [returnCode] = setObjectPosition(sim, clientID, target,
position);
                pause(1)
                % targZ    = 1;
                % targZinv = 2;
                % p_x_star = 0;
                % p_z_star = j/(j+1)*targZ + 1/(j+1)*targZinv;
                % j = j + 0.0001;
        end

        % Read current time
        t = clock;
        currentTime = t(6);

        % send to target
        position = [p_x_star,p_y_star,p_z_star];
        [returnCode] = setObjectPosition(sim, clientID, target, position);

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

        % position = [0,0,2]

        % % Send to target
        % [returnCode] = setObjectPosition(sim, clientID, target, position);


        % position = [1,0,2]

        % % Send to target
        % [returnCode] = setObjectPosition(sim, clientID, target, position);

        % pause(1)
        % position = [1,0,1]

        % % Send to target
        % [returnCode] = setObjectPosition(sim, clientID, target, position);

        % pause(1)
        % position = [0,0,1]

        % % Send to target
        % [returnCode] = setObjectPosition(sim, clientID, target, position);


        % [returnCode, quad_pos] = getObjectPosition(sim, clientID, Quad, 0);
        % p_x = [p_x; quad_pos(1)];
        % p_y = [p_y; quad_pos(2)];
        % p_z = [p_z; quad_pos(3)];
```

```
        % pause(10)

        end
    end
    % plot
    positions = [p_x, p_y, p_z];
    figure(1)
    plot3(positions(:,1),positions(:,2),positions(:,3),'linewidth',3);
    title('3D Quadrotor path from CoppeliaSim')
    xlabel('x [m]')
    ylabel('y [m]')
    zlabel('z [m]')
    saveas(gcf,'Part2Box_3d.png');
    figure(2)
    plot(positions(:,1),positions(:,3))
    title('2D Quadrotor path from CoppeliaSim')
    xlabel('x [m]')
    ylabel('z [m]')
    saveas(gcf,'Part2Box_2d.png');

    % Kill the connection to CopelliaSim
    uninitializeComm(sim, clientID)

else
    disp('Unable to connect to CopelliaSim')
end
```

```
Note: always make sure you use the corresponding remoteApi library
(i.e. 32bit Matlab will not work with 64bit remoteApi, and vice-versa)
Connected to CopelliaSim

ans =

     0
```


3D Quadrotor path from CoppeliaSim
z [m]
2.5
2
1.5
1
0.5
0
1
0
-1
-2
-3
×10^-3
y [m]
-0.5
0
0.5
1
1.5
x [m]


2D Quadrotor path from CoppeliaSim
z [m]
2.5
2
1.5
1
0.5
0
-0.2
0
0.2
0.4
0.6
0.8
1
1.2
1.4
x [m]

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