***CODE FOR COMBINED CALCULATION OF DISTANCE, SPEED, AND PLOT***

% Load the csv file containing position y and position x data

data = readmatrix('NF1P1-Run 2-201013-094942-1-xypts.csv');

% Extract x and y position columns from the data

pos\_x = data(:,1);     % position x values are in the first column

pos\_y = data(:,2);     % position y values are in the second column

% Compute the Euclidean distance between each pair of consecutive positions

dist\_traveled = sqrt(diff(pos\_x).^2 + diff(pos\_y).^2);

% Compute the total distance traveled

total\_dist = sum(dist\_traveled);

% Compute the time elapsed between each pair of consecutive positions

time\_diff = diff(data(:,3));

% Compute the speed between each pair of consecutive positions

speed = dist\_traveled./time\_diff;

% Compute the average speed

avg\_speed = mean(speed);

% Plot the positions as dots connected by a line

figure;

plot(pos\_x, pos\_y, '-o', 'Marker', 'none');

xlabel('Position x');

ylabel('Position y');

title('Positions traveled');

% Display the total distance traveled and average speed

fprintf('Total distance traveled: %f pixels\n', total\_dist);

fprintf('Average speed: %f pixels per second\n', avg\_speed);

This Matlab code will provide the total distance after extracting positions x and y from the CSV file. It will also provide the average speed calculated based on the positions and time extracted from the same CSV file. Jalen and I use the dltdv8 software to trace positions of a single fly in the arena and then calculate the total distance traveled and average speed.

This code will also provide a trace of the positions traveled by the fly