

Load data

```
load("running.mat");
```

Variables

```
earthCirc = 24901; %miles
stride = 2.5; %feets
totaldist = 0;
lat = Position{1,:};
lon = Position{2,:};
speed = Position{4,:};
t = datevec(Position.Timestamp);
t_minutes = t(:,4)*3600 + t(:,5) + t(:,6)/60;
t_minutes = t_minutes - t_minutes(1);
```

Measure distance and step

```
% Preallocate storage
dist_per_point = zeros(length(lat),1);

for i = 1:(length(lat)-1)
    lat1 = lat(i);
    lon1 = lon(i);
    lat2 = lat(i+1);
    lon2 = lon(i+1);

    diff = distance(lat1, lon1, lat2, lon2);

    dist = (diff / 360) * earthCirc;
    totaldist = totaldist + dist;

    dist_per_point(i+1) = totaldist; % accumulate distance
end

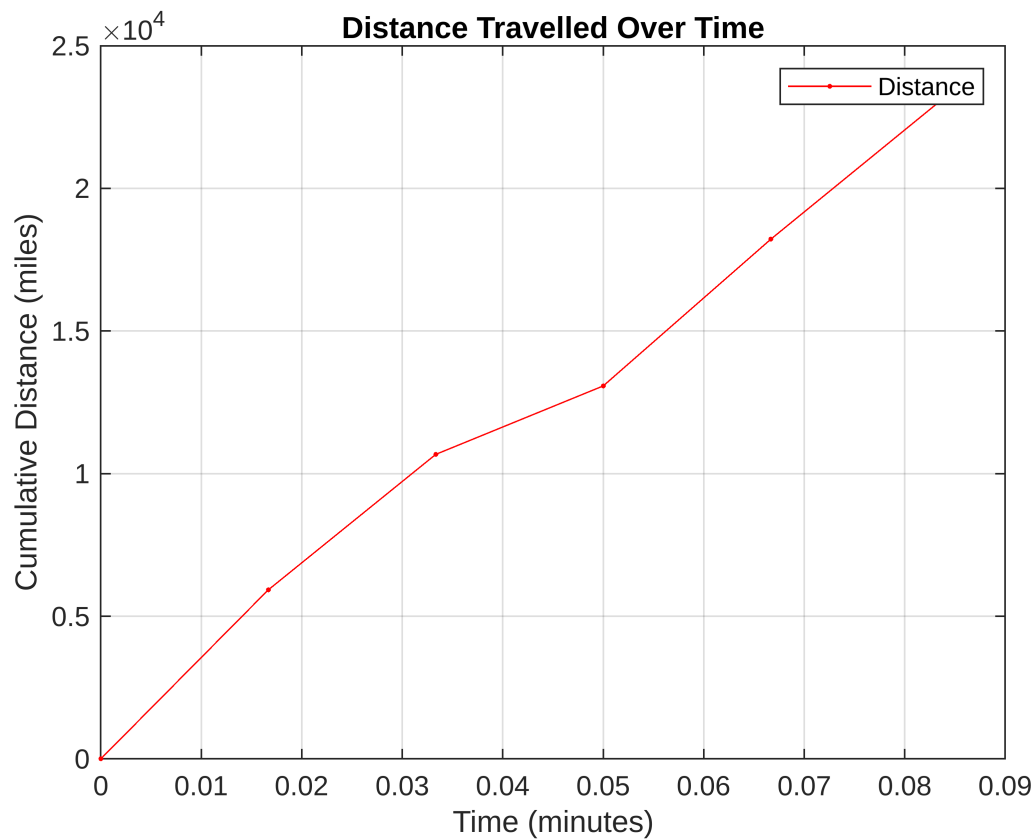
totaldist_ft = totaldist * 5280;
steps = totaldist_ft/stride;
```

Distance travelled by time

```
minLength = min(length(t_minutes), length(dist_per_point));
t_minutes = t_minutes(1:minLength);
dist_per_point = dist_per_point(1:minLength);

figure;
plot(t_minutes, dist_per_point, '-r');
xlabel('Time (minutes)');
ylabel('Cumulative Distance (miles)');
title('Distance Travelled Over Time');
legend('Distance');
```

```
grid on;
```



Calorie Calculation

```
timeused = totaldist/speed(end);  
calBurn = timeused * 3.5 * (90*3.5)/(200*60); % calories
```

Display

```
values = [totaldist, calBurn];  
categories = {'Distance', 'Calories'};  
  
figure;  
bar(values);  
set(gca, 'xticklabel', categories);  
ylabel('Value');  
title('Summary of Walking Activity');  
grid on;
```

