```matlab
function laplacian_formation


clear all;
close all;
%clc;
deltaT = 0.08;
threshold = 0.05;

VGx = 1;  % goal velocity X
VGy = 0; % goal velocity Y

I = [-1  0  0  0
     1 -1  0  0
     0  1 -1 -1
     0  0  1  0
     0  0  0  1];

W = 0.5*(1.0) * eye(size(I,2)); % weight of edges in the graph

x=[0,1,-1,0,1]'; %Initial positions X
y=[4,3,2,1,0]'; %Initial positions Y

% bias vector用来保持距离！
% graph in Fig. 3 of Lab   4
bx = [0,2,6,8,8]';  % The desired X biases of the agents from the center of formation
by = [4,2,2,4,0]'; % The desired Y biases of the agents from the center of formation
% point
bx = [0,0,0,0,0]';  % The desired X biases of the agents from the center of formation
by = [0,0,0,0,0]'; % The desired Y biases of the agents from the center of formation
% column
bx = [0,0,0,0,0]';  % The desired X biases of the agents from the center of formation
by = [1,0.5,0,-0.5,-1]'; % The desired Y biases of the agents from the center of formation
% 初始计算Laplace矩阵
L=I*W*I'; % computing the Laplace matrix



X= [x y];

b = [bx by];

hold on;
grid on;
%axis([-5,5,-5,5]);

step=0;
X_next = X;
converged = 0;
while (~converged)
    X = X_next;
    X_next = X + (-1)*L*(X-b) * deltaT;  % Laplacian feedback control
    % 对于epuck小车，还要进行一次转速的转换！
    % 从质心转变为两轮速度！
```

```matlab
        X_next(:,1) = X_next(:,1) + deltaT*VGx; % constant velocity twards X-axis
        X_next(:,2) = X_next(:,2) + deltaT*VGy; % constant velocity twards Y-axis

        plot_agents(deltaT, step, X_next);
        step = step + 1;
        % threshold这个是对应的阈值，如果要汇聚到一点，则必须缩小阈值！
        if (max(abs(X_next-X))<threshold)
            converged =1;
        end
        pause(0.1);
    end
    display('final position of agents');
    display(X);

    display('execution time:');
    display((step-2)*deltaT);

end


function plot_agents(stepsize, step, X)
    plot(X(1,1),X(1,2),'vr','LineWidth',2);
    plot(X(2,1),X(2,2),'vg','LineWidth',2);
    plot(X(3,1),X(3,2),'vk','LineWidth',2);
    plot(X(4,1),X(4,2),'vb','LineWidth',2);
    plot(X(5,1),X(5,2),'vy','LineWidth',2);

    str1 = strcat('Time: ' , num2str((step-1)*stepsize,'%6.4g'), ' s');
    delete(findall(gcf,'Tag','Timetext'));
    annotationPos = [.12 0 0.6 0.3];
    htxtbox = annotation('textbox',annotationPos, ...
    'String'     ,str1, ...
    'FontSize'   ,14, ...
    'FitBoxToText', 'on', ...
    'EdgeColor', 'none', ...
    'FontName'   , 'Times', ...
    'color','b', ...
    'Tag' , 'Timetext');

end
```