

```

1 function [ceX, ceY, eX, eY] = detectCenter(N, filename, pathname)
2
3     if(nargin == 0)
4         N = 1;
5     end
6
7     if(nargin < 2)
8         [filename, pathname] = uigetfile(sprintf('%s', ...
9                                             '*.txt'));
10    end
11
12    [coordx, coordy, datax, datay] = scanfile(filename, pathname);
13
14    [x, y, u, v] = analyseField(filename, pathname);
15    pas = coordy(2)-coordy(1);
16
17    xmoy = [];
18    ymoy = [];
19
20    ecartx = [];
21    ecarty = [];
22
23    copyobj(gcf,0);
24    hold on;
25    quiver(x, y, u', v');
26
27    for i = 1:N
28        [x1,y1] = ginput(2);
29        L1 = [];
30        L2 = [];
31
32        for i = 1:size(coordx)
33            if ((coordx(i)-x1(1))^2 + (coordy(i)-y1(1))^2) < 5*pas^2
34                L1 = [L1, i];
35            end
36            if ((coordx(i)-x1(2))^2 + (coordy(i)-y1(2))^2) < 5*pas^2
37                L2 = [L2, i];
38            end
39        end
40
41        NX = [];
42        NY = [];
43
44        dX_1 = [];
45        dY_1 = [];
46
47        dX_2 = [];
48        dY_2 = [];
49
50        for i = 1:min(length(L1),length(L2))
51            A = [datay(L1(i)), -datay(L2(i)); -datax(L1(i)), datax(L2(i))];
52            B = [coordx(L2(i))-coordx(L1(i)) ; coordy(L2(i))-coordy(L1(i))];
53            D = A\B;
54
55            NX = [NX, coordx(L1(i)) + D(1)*datay(L1(i))];
56            NY = [NY, coordy(L1(i)) - D(1)*datax(L1(i))];
57
58            dX_1 = [dX_1 ; coordx(L1(i)) + datay(L1(i))*[0:1:NX]];
59            dY_1 = [dY_1 ; coordy(L1(i)) - datax(L1(i))*[0:1:NX]];

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60
61     dX_2 = [dX_2 ; coordx(L2(i)) + datay(L2(i))*[0:1:NX]];
62     dY_2 = [dY_2 ; coordy(L2(i)) - datax(L2(i))*[0:1:NX]];
63
64     plot(dX_1(i,:), dY_1(i,:));
65     plot(dX_2(i,:), dY_2(i,:));
66 end
67
68     xmoy = [xmoy, sum(NX)/length(NX)];
69     ymoy = [ymoy, sum(NY)/length(NY)];
70
71     ecartx = [ecartx, sqrt(sum(NX.^2)/length(NX)-xmoy.^2)];
72     ecarty = [ecarty, sqrt(sum(NY.^2)/length(NY)-ymoy.^2)];
73
74     plot(xmoy, ymoy, '.', 'MarkerSize', 15, 'Color', 'k');
75 end
76     range = [min(x), max(max(xmoy + 100),max(x)), min(y), max(max(ymoy + 100),max(y))];
77     axis(range);
78
79     if (N > 1)
80         axis([min(xmoy-50), max(xmoy+50), min(ymoy-50), max(ymoy+50)]);
81         in = input('Combien de points voulez vous invalider ? \n');
82
83         if (in > 0)
84             in = floor(in);
85             inva = [];
86
87             [x, y] = ginput(in);
88
89             for i = 1:in
90                 [c index] = min(xmoy-x(1));
91                 invaX = [inva xmoy(index)];
92                 invaY = [inva ymoy(index)];
93
94                 xmoy(index) = [];
95                 ymoy(index) = [];
96             end
97
98             plot(invaX, invaY, '.', 'Color', 'r', 'MarkerSize', 15);
99         else
100             axis(range);
101         end
102     end
103
104     axis(range);
105
106     ceX = sum(xmoy)/length(xmoy);
107     ceY = sum(ymoy)/length(ymoy);
108     eX = sqrt(sum(xmoy.^2)/length(xmoy)-xmoy.^2);
109     eY = sqrt(sum(ymoy.^2)/length(ymoy)-ymoy.^2);
110
111     plot(ceX, ceY, '.', 'Color', 'b', 'MarkerSize', 15);
112
113     hold off;
114 end

```