Case Studies

In this chapter the author will administrate further the stage 2 programme using two other real NDT collected data. First collected data were collected were for a chosen slap from a structure at the city of London near City university. Second data were collected from a bridge in the North of the UK.

Example 1

Three different NDT methods were used to investigate the slap which were; Covermeter, Half-Cell, and Resistivity. The results were as follows:

Covermeter:
The readings were taken to determine the reinforcement cover and it was in mm

x	y	
0	0	400
0	50	450
0	100	400
0	150	350
0	200	250
0	250	300
0	300	150
0	350	200
0	400	250
50	0	350
50	50	350
50	100	200
50	150	250
50	200	100
50	250	250
50	300	50
50	350	100
50	400	100
100	0	250
100	50	200
100	100	150
100	150	150
100	200	100
100	250	50
100	300	50
100	350	50
100	400	50
150	0	250
150	50	150
150	100	100
150	150	50
150	200	100
150	250	150
150	300	100
150	350	50
150	400	100
200	0	300
200	50	50
200	100	100
200	150	100
200	200	50
200	250	50
200	300	50
200	350	50
200	400	100

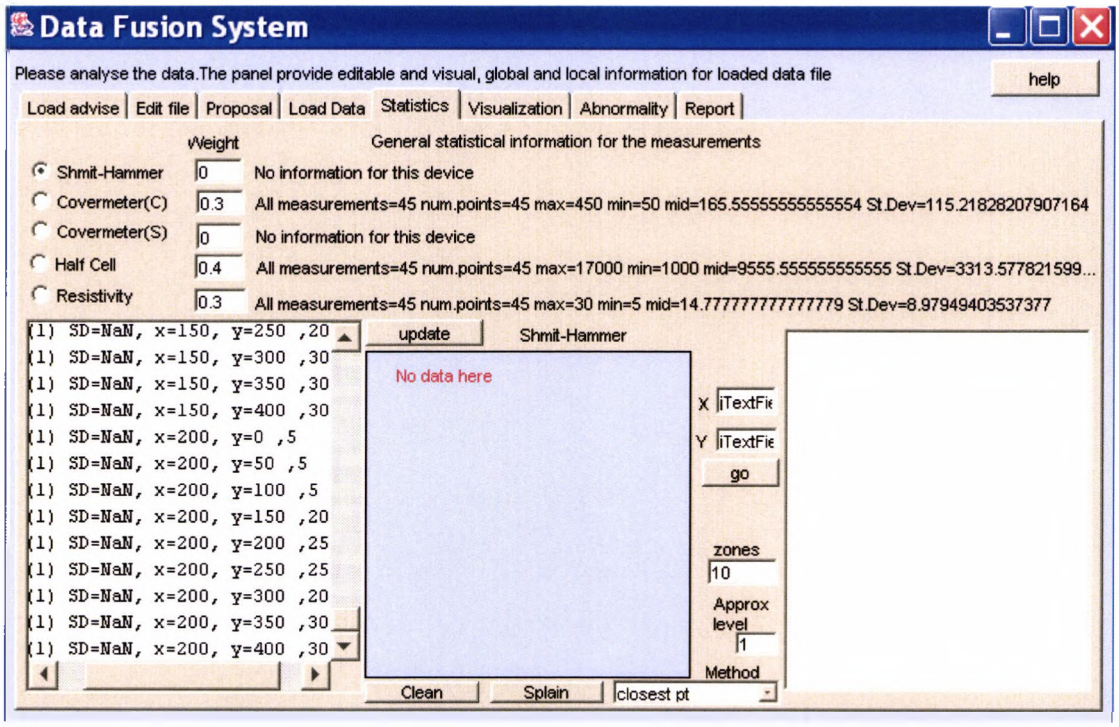
Half-Cell:
The readings were as follows

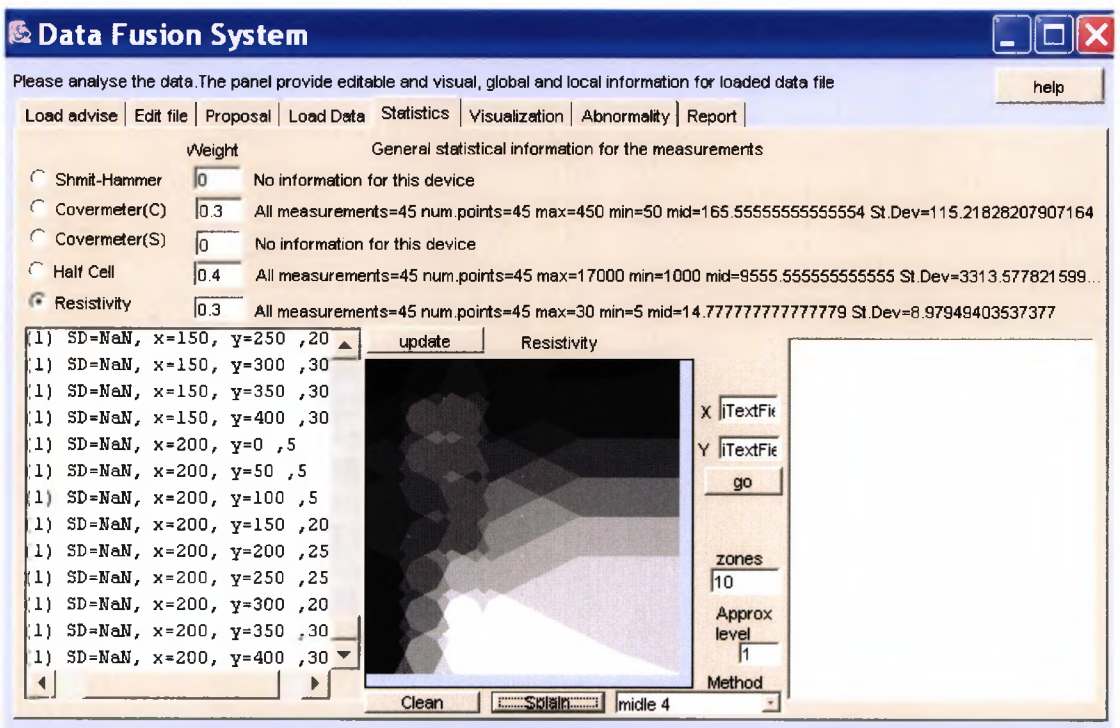
x	y	
0	0	6000
0	50	6000
0	100	5000
0	150	8000
0	200	7000
0	250	7000
0	300	13000
0	350	9000
0	400	6000
50	0	6000
50	50	7000
50	100	7000
50	150	8000
50	200	10000
50	250	9000
50	300	12000
50	350	10000
50	400	1000
100	0	7000
100	50	7000
100	100	10000
100	150	12000
100	200	13000
100	250	17000
100	300	11000
100	350	13000
100	400	12000
150	0	8000
150	50	8000
150	100	7000
150	150	9000
150	200	10000
150	250	15000
150	300	12000
150	350	13000
150	400	13000
200	0	6000
200	50	8000
200	100	6000
200	150	9000
200	200	14000
200	250	15000
200	300	13000
200	350	14000
200	400	11000

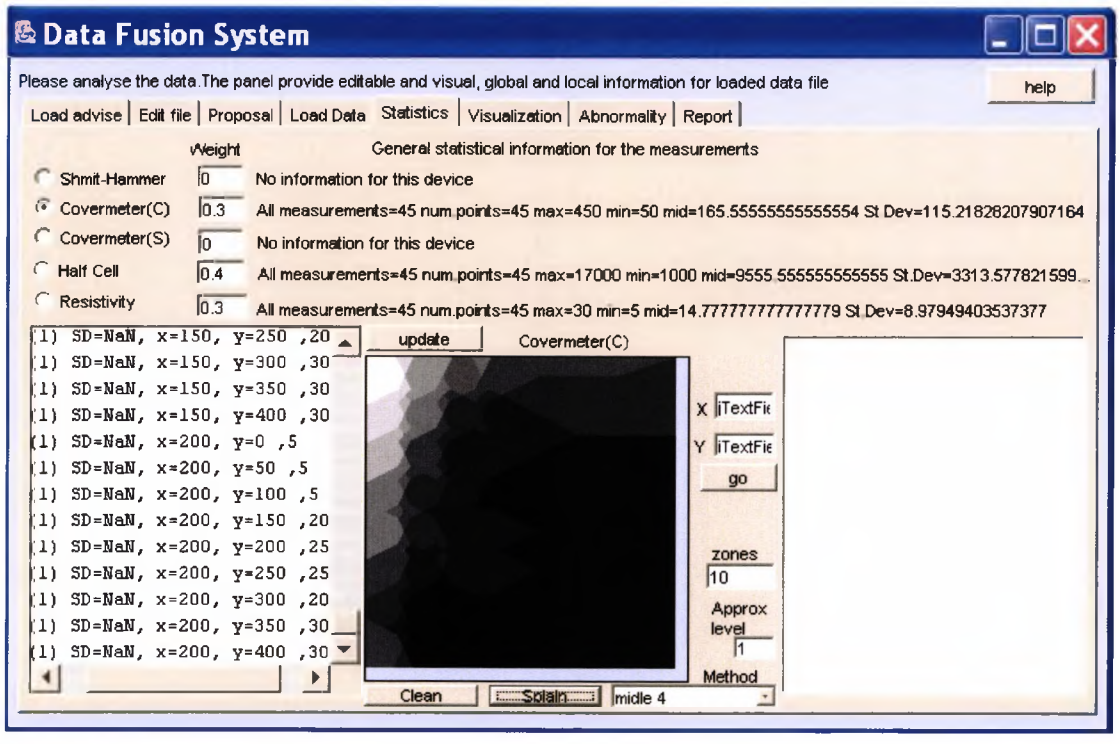
Resistivity:
The readings were as follows

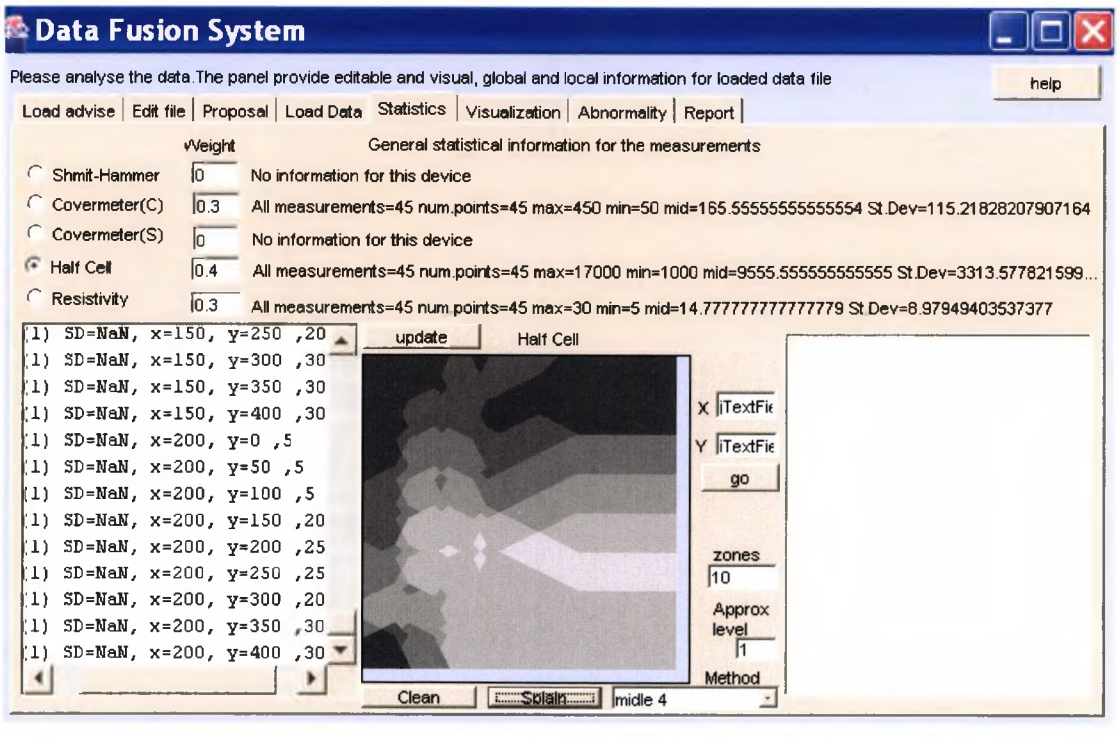
x	y	
0	0	5
0	50	5
0	100	5
0	150	10
0	200	10
0	250	10
0	300	5
0	350	5
0	400	10
50	0	5
50	50	5
50	100	15
50	150	10
50	200	10
50	250	10
50	300	10
50	350	10
50	400	10
100	0	5
100	50	20
100	100	20
100	150	20
100	200	15
100	250	20
100	300	25
100	350	30
100	400	30
150	0	5
150	50	15
150	100	10
150	150	15
150	200	10
150	250	20
150	300	30
150	350	30
150	400	30
200	0	5
200	50	5
200	100	5
200	150	20
200	200	25
200	250	25
200	300	20
200	350	30
200	400	30

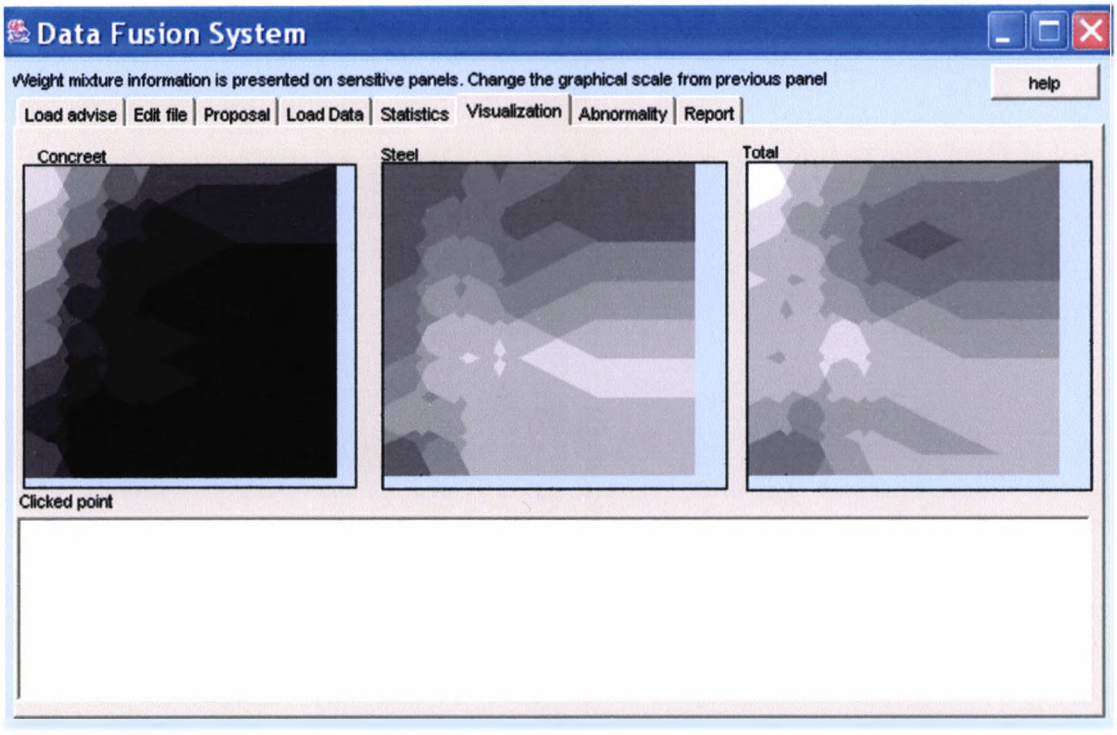
In this case there were not enough data for the statistic and it will be one way to test the programme. Applying the results directly to the programme will be illustrated in the following figures:

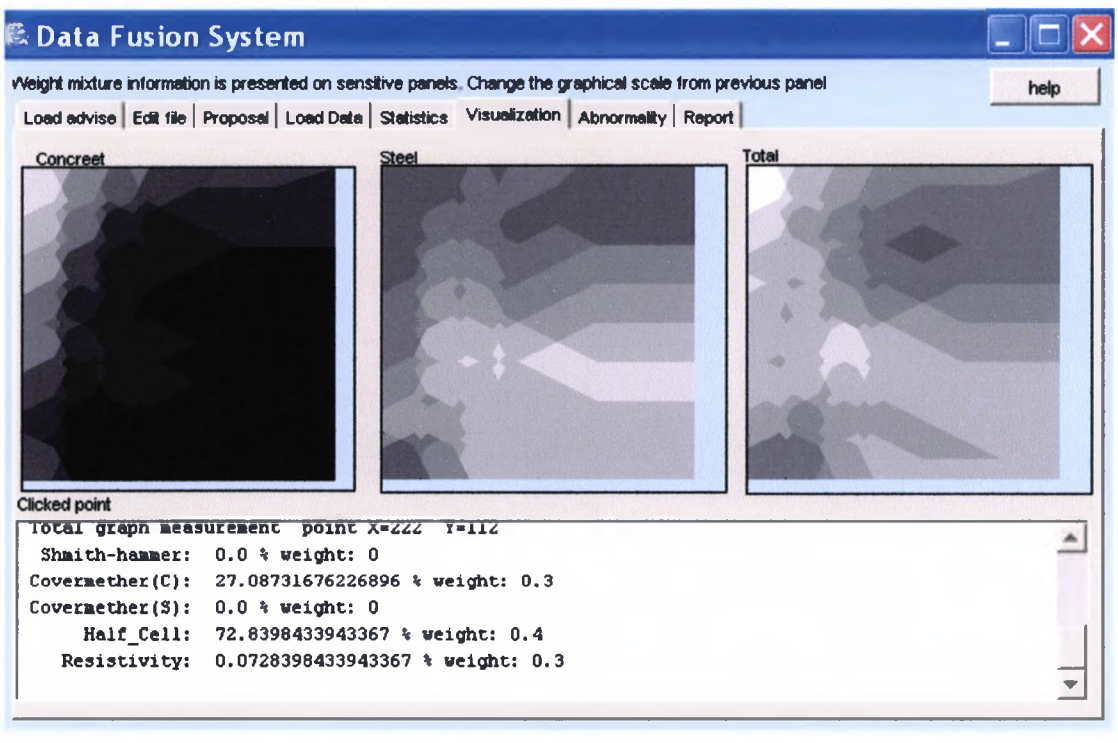

Data Fusion System
Please analyse the data.The panel provide editable and visual, global and local information for loaded data file
help
Load advise
Edit file
Proposal
Load Data
Statistics
Visualization
Abnormality
Report
Weight
General statistical information for the measurements
Shmit-Hammer
0
No information for this device
Covermeter(C)
0.3
All measurements=45 num.points=45 max=450 min=50 mid=165.55555555555554 St.Dev=115.21828207907164
Covermeter(S)
0
No information for this device
Half Cell
0.4
All measurements=45 num.points=45 max=17000 min=1000 mid=9555.555555555555 St.Dev=3313.577821599...
Resistivity
0.3
All measurements=45 num.points=45 max=30 min=5 mid=14.777777777777779 St.Dev=8.97949403537377
(1) SD=NaN, x=150, y=250 ,20
(1) SD=NaN, x=150, y=300 ,30
(1) SD=NaN, x=150, y=350 ,30
(1) SD=NaN, x=150, y=400 ,30
(1) SD=NaN, x=200, y=0 ,5
(1) SD=NaN, x=200, y=50 ,5
(1) SD=NaN, x=200, y=100 ,5
(1) SD=NaN, x=200, y=150 ,20
(1) SD=NaN, x=200, y=200 ,25
(1) SD=NaN, x=200, y=250 ,25
(1) SD=NaN, x=200, y=300 ,20
(1) SD=NaN, x=200, y=350 ,30
(1) SD=NaN, x=200, y=400 ,30
update
Shmit-Hammer
No data here
X
Y
go
zones
10
Approx level
1
Method
Clean
Splain
closest pt


Data Fusion System
Please analyse the data.The panel provide editable and visual, global and local information for loaded data file
help
Load advise
Edit file
Proposal
Load Data
Statistics
Visualization
Abnormality
Report
Weight
General statistical information for the measurements
Shmit-Hammer
0
No information for this device
Covermeter(C)
0.3
All measurements=45 num.points=45 max=450 min=50 mid=165.55555555555554 St.Dev=115.21828207907164
Covermeter(S)
0
No information for this device
Half Cell
0.4
All measurements=45 num.points=45 max=17000 min=1000 mid=9555.555555555555 St.Dev=3313.577821599...
Resistivity
0.3
All measurements=45 num.points=45 max=30 min=5 mid=14.777777777777779 St.Dev=8.97949403537377
(1) SD=NaN, x=150, y=250 ,20
(1) SD=NaN, x=150, y=300 ,30
(1) SD=NaN, x=150, y=350 ,30
(1) SD=NaN, x=150, y=400 ,30
(1) SD=NaN, x=200, y=0 ,5
(1) SD=NaN, x=200, y=50 ,5
(1) SD=NaN, x=200, y=100 ,5
(1) SD=NaN, x=200, y=150 ,20
(1) SD=NaN, x=200, y=200 ,25
(1) SD=NaN, x=200, y=250 ,25
(1) SD=NaN, x=200, y=300 ,20
(1) SD=NaN, x=200, y=350 ,30
(1) SD=NaN, x=200, y=400 ,30
update
Resistivity
X
Y
go
zones
10
Approx level
1
Method
Clean
Splain
midle 4


Data Fusion System
Please analyse the data.The panel provide editable and visual, global and local information for loaded data file
help
Load advise
Edit file
Proposal
Load Data
Statistics
Visualization
Abnormality
Report
Weight
General statistical information for the measurements
Shmit-Hammer
0
No information for this device
Covermeter(C)
0.3
All measurements=45 num.points=45 max=450 min=50 mid=165.55555555555554 St.Dev=115.21828207907164
Covermeter(S)
0
No information for this device
Half Cell
0.4
All measurements=45 num.points=45 max=17000 min=1000 mid=9555.555555555555 St.Dev=3313.577821599...
Resistivity
0.3
All measurements=45 num.points=45 max=30 min=5 mid=14.777777777777779 St.Dev=8.97949403537377
(1) SD=NaN, x=150, y=250 ,20
(1) SD=NaN, x=150, y=300 ,30
(1) SD=NaN, x=150, y=350 ,30
(1) SD=NaN, x=150, y=400 ,30
(1) SD=NaN, x=200, y=0 ,5
(1) SD=NaN, x=200, y=50 ,5
(1) SD=NaN, x=200, y=100 ,5
(1) SD=NaN, x=200, y=150 ,20
(1) SD=NaN, x=200, y=200 ,25
(1) SD=NaN, x=200, y=250 ,25
(1) SD=NaN, x=200, y=300 ,20
(1) SD=NaN, x=200, y=350 ,30
(1) SD=NaN, x=200, y=400 ,30
update
Covermeter(C)
X
Y
go
zones
10
Approx level
1
Method
Clean
Splain
midle 4


Data Fusion System
Please analyse the data.The panel provide editable and visual, global and local information for loaded data file
help
Load advise
Edit file
Proposal
Load Data
Statistics
Visualization
Abnormality
Report
Weight
General statistical information for the measurements
Shmit-Hammer
0
No information for this device
Covermeter(C)
0.3
All measurements=45 num.points=45 max=450 min=50 mid=165.55555555555554 St.Dev=115.21828207907164
Covermeter(S)
0
No information for this device
Half Cell
0.4
All measurements=45 num.points=45 max=17000 min=1000 mid=9555.555555555555 St.Dev=3313.577821599...
Resistivity
0.3
All measurements=45 num.points=45 max=30 min=5 mid=14.777777777777779 St.Dev=8.97949403537377
(1) SD=NaN, x=150, y=250 ,20
(1) SD=NaN, x=150, y=300 ,30
(1) SD=NaN, x=150, y=350 ,30
(1) SD=NaN, x=150, y=400 ,30
(1) SD=NaN, x=200, y=0 ,5
(1) SD=NaN, x=200, y=50 ,5
(1) SD=NaN, x=200, y=100 ,5
(1) SD=NaN, x=200, y=150 ,20
(1) SD=NaN, x=200, y=200 ,25
(1) SD=NaN, x=200, y=250 ,25
(1) SD=NaN, x=200, y=300 ,20
(1) SD=NaN, x=200, y=350 ,30
(1) SD=NaN, x=200, y=400 ,30
update
Half Cell
X
Y
go
zones
10
Approx level
1
Method
Clean
Splain
midle 4


Data Fusion System
Weight mixture information is presented on sensitive panels. Change the graphical scale from previous panel
help
Load advise
Edit file
Proposal
Load Data
Statistics
Visualization
Abnormality
Report
Concreet
Steel
Total
Clicked point


Data Fusion System
Weight mixture information is presented on sensitive panels. Change the graphical scale from previous panel
help
Load advise
Edit file
Proposal
Load Data
Statistics
Visualization
Abnormality
Report
Concreet
Steel
Total
Clicked point
Total graph measurement point X=222 Y=112
Shmith-hammer: 0.0 % weight: 0
Covermether(C): 27.08731676226896 % weight: 0.3
Covermether(S): 0.0 % weight: 0
Half_Cell: 72.8398433943367 % weight: 0.4
Resistivity: 0.0728398433943367 % weight: 0.3

R E P O R T

1).The initial expert file is C:\Program Files\Ziad\data\Example.exp.
From the proposal options the expert result string is: The wind and water increase concrete damages&0.3,0.3,0.2,0.1,0.1.

2).The data file with name C:\Program Files\Ziad\data\test1.dat was loaded.
The working data are:

Covermeter(C)

1 (1) SD=NaN, x=0, y=0 ,400
2 (1) SD=NaN, x=0, y=50 ,450
3 (1) SD=NaN, x=0, y=100 ,400
4 (1) SD=NaN, x=0, y=150 ,350
5 (1) SD=NaN, x=0, y=200 ,250
6 (1) SD=NaN, x=0, y=250 ,300
7 (1) SD=NaN, x=0, y=300 ,150
8 (1) SD=NaN, x=0, y=350 ,200
9 (1) SD=NaN, x=0, y=400 ,250
10 (1) SD=NaN, x=50, y=0 ,350
11 (1) SD=NaN, x=50, y=50 ,350
12 (1) SD=NaN, x=50, y=100 ,200
13 (1) SD=NaN, x=50, y=150 ,250
14 (1) SD=NaN, x=50, y=200 ,100
15 (1) SD=NaN, x=50, y=250 ,250
16 (1) SD=NaN, x=50, y=300 ,50
17 (1) SD=NaN, x=50, y=350 ,100
18 (1) SD=NaN, x=50, y=400 ,100
19 (1) SD=NaN, x=100, y=0 ,250
20 (1) SD=NaN, x=100, y=50 ,200
21 (1) SD=NaN, x=100, y=100 ,150
22 (1) SD=NaN, x=100, y=150 ,150
23 (1) SD=NaN, x=100, y=200 ,100
24 (1) SD=NaN, x=100, y=250 ,50
25 (1) SD=NaN, x=100, y=300 ,50
26 (1) SD=NaN, x=100, y=350 ,50
27 (1) SD=NaN, x=100, y=400 ,50
28 (1) SD=NaN, x=150, y=0 ,250
29 (1) SD=NaN, x=150, y=50 ,150
30 (1) SD=NaN, x=150, y=100 ,100
31 (1) SD=NaN, x=150, y=150 ,50
32 (1) SD=NaN, x=150, y=200 ,100
33 (1) SD=NaN, x=150, y=250 ,150
34 (1) SD=NaN, x=150, y=300 ,100
35 (1) SD=NaN, x=150, y=350 ,50
36 (1) SD=NaN, x=150, y=400 ,100
37 (1) SD=NaN, x=200, y=0 ,300
38 (1) SD=NaN, x=200, y=50 ,50
39 (1) SD=NaN, x=200, y=100 ,100
40 (1) SD=NaN, x=200, y=150 ,100
41 (1) SD=NaN, x=200, y=200 ,50
42 (1) SD=NaN, x=200, y=250 ,50
43 (1) SD=NaN, x=200, y=300 ,50
44 (1) SD=NaN, x=200, y=350 ,50
45 (1) SD=NaN, x=200, y=400 ,100

Half Cell

1 (1) SD=NaN, x=0, y=0 ,6000
2 (1) SD=NaN, x=0, y=50 ,6000
3 (1) SD=NaN, x=0, y=100 ,5000
4 (1) SD=NaN, x=0, y=150 ,8000

```
5 (1) SD=NaN, x=0, y=200 ,7000
6 (1) SD=NaN, x=0, y=250 ,7000
7 (1) SD=NaN, x=0, y=300 ,13000
8 (1) SD=NaN, x=0, y=350 ,9000
9 (1) SD=NaN, x=0, y=400 ,6000
10 (1) SD=NaN, x=50, y=0 ,6000
11 (1) SD=NaN, x=50, y=50 ,7000
12 (1) SD=NaN, x=50, y=100 ,7000
13 (1) SD=NaN, x=50, y=150 ,8000
14 (1) SD=NaN, x=50, y=200 ,10000
15 (1) SD=NaN, x=50, y=250 ,9000
16 (1) SD=NaN, x=50, y=300 ,12000
17 (1) SD=NaN, x=50, y=350 ,10000
18 (1) SD=NaN, x=50, y=400 ,1000
19 (1) SD=NaN, x=100, y=0 ,7000
20 (1) SD=NaN, x=100, y=50 ,7000
21 (1) SD=NaN, x=100, y=100 ,10000
22 (1) SD=NaN, x=100, y=150 ,12000
23 (1) SD=NaN, x=100, y=200 ,13000
24 (1) SD=NaN, x=100, y=250 ,17000
25 (1) SD=NaN, x=100, y=300 ,11000
26 (1) SD=NaN, x=100, y=350 ,13000
27 (1) SD=NaN, x=100, y=400 ,12000
28 (1) SD=NaN, x=150, y=0 ,8000
29 (1) SD=NaN, x=150, y=50 ,8000
30 (1) SD=NaN, x=150, y=100 ,7000
31 (1) SD=NaN, x=150, y=150 ,9000
32 (1) SD=NaN, x=150, y=200 ,10000
33 (1) SD=NaN, x=150, y=250 ,15000
34 (1) SD=NaN, x=150, y=300 ,12000
35 (1) SD=NaN, x=150, y=350 ,13000
36 (1) SD=NaN, x=150, y=400 ,13000
37 (1) SD=NaN, x=200, y=0 ,6000
38 (1) SD=NaN, x=200, y=50 ,8000
39 (1) SD=NaN, x=200, y=100 ,6000
40 (1) SD=NaN, x=200, y=150 ,9000
41 (1) SD=NaN, x=200, y=200 ,14000
42 (1) SD=NaN, x=200, y=250 ,15000
43 (1) SD=NaN, x=200, y=300 ,13000
44 (1) SD=NaN, x=200, y=350 ,14000
45 (1) SD=NaN, x=200, y=400 ,11000
Resistivity
1 (1) SD=NaN, x=0, y=0 ,5
2 (1) SD=NaN, x=0, y=50 ,5
3 (1) SD=NaN, x=0, y=100 ,5
4 (1) SD=NaN, x=0, y=150 ,10
5 (1) SD=NaN, x=0, y=200 ,10
6 (1) SD=NaN, x=0, y=250 ,10
7 (1) SD=NaN, x=0, y=300 ,5
8 (1) SD=NaN, x=0, y=350 ,5
9 (1) SD=NaN, x=0, y=400 ,10
10 (1) SD=NaN, x=50, y=0 ,5
11 (1) SD=NaN, x=50, y=50 ,5
12 (1) SD=NaN, x=50, y=100 ,15
13 (1) SD=NaN, x=50, y=150 ,10
14 (1) SD=NaN, x=50, y=200 ,10
15 (1) SD=NaN, x=50, y=250 ,10
16 (1) SD=NaN, x=50, y=300 ,10
17 (1) SD=NaN, x=50, y=350 ,10
18 (1) SD=NaN, x=50, y=400 ,10
19 (1) SD=NaN, x=100, y=0 ,5
```

```
20 (1) SD=NaN, x=100, y=50 ,20
21 (1) SD=NaN, x=100, y=100 ,20
22 (1) SD=NaN, x=100, y=150 ,20
23 (1) SD=NaN, x=100, y=200 ,15
24 (1) SD=NaN, x=100, y=250 ,20
25 (1) SD=NaN, x=100, y=300 ,25
26 (1) SD=NaN, x=100, y=350 ,30
27 (1) SD=NaN, x=100, y=400 ,30
28 (1) SD=NaN, x=150, y=0 ,5
29 (1) SD=NaN, x=150, y=50 ,15
30 (1) SD=NaN, x=150, y=100 ,10
31 (1) SD=NaN, x=150, y=150 ,15
32 (1) SD=NaN, x=150, y=200 ,10
33 (1) SD=NaN, x=150, y=250 ,20
34 (1) SD=NaN, x=150, y=300 ,30
35 (1) SD=NaN, x=150, y=350 ,30
36 (1) SD=NaN, x=150, y=400 ,30
37 (1) SD=NaN, x=200, y=0 ,5
38 (1) SD=NaN, x=200, y=50 ,5
39 (1) SD=NaN, x=200, y=100 ,5
40 (1) SD=NaN, x=200, y=150 ,20
41 (1) SD=NaN, x=200, y=200 ,25
42 (1) SD=NaN, x=200, y=250 ,25
43 (1) SD=NaN, x=200, y=300 ,20
44 (1) SD=NaN, x=200, y=350 ,30
45 (1) SD=NaN, x=200, y=400 ,30.

 3). The weights for the devices are:
0
0.3
0
0.4
0.3

 4). Global analysis for the data show:
 Device 1: No information for this device
 Device 2: All measurements=45 num. points=45 max=450 min=50
mid=165.55555555555554 St. Dev=115.21828207907164
 Device 3: No information for this device
 Device 4: All measurements=45 num. points=45 max=17000 min=1000
mid=9555.555555555555 St. Dev=3313.5778215997857
 Device 5: All measurements=45 num. points=45 max=30 min=5
mid=14.777777777777779 St. Dev=8.97949403537377

 5). provided experiments for particular points:

 6). provided visualization point's checking analyse:

 Concrete graph measurement point X=288 Y=174
 Schmidt-hammer data:  0.0 % weight: 0
     Covermeter(C):  100.0 % weight: 0.3

 Steel graph measurement point X=122 Y=112
 Covermeter(S):  0.0 % weight: 0
      Half-Cell:  99.87187489733566 % weight: 0.4
    Resistivity:  0.12812510266434507 % weight: 0.3

 Total graph measurement point X=222 Y=112
  Schmidt-hammer:  0.0 % weight: 0
 Covermeter(C):  27.08731676226896 % weight: 0.3
 Covermeter(S):  0.0 % weight: 0
```

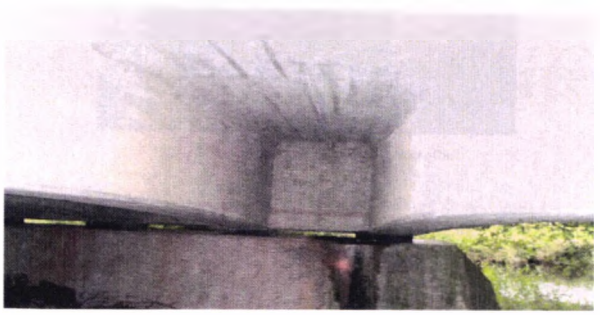
```
      Half-Cell:  72.8398433943367 % weight: 0.4
   Resistivity:  0.0728398433943367 % weight: 0.3
```

7). Abnormality experiments:

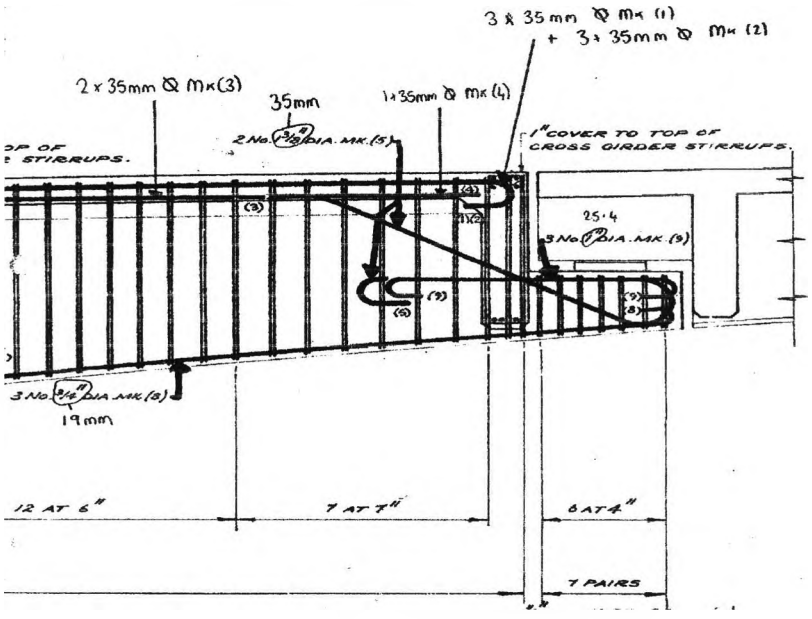
```
----WEIGHT----
Device weight
0     0
1     0.3
2     0
3     0.4
4     0.3
-------- STANDART DEVIATION--------
SD in device: 1 = 115.21828207907164
SD in device: 3 = 3313.5778215997857
SD in device: 4 = 8.97949403537377
------------------------
Big standard dev in device: 3 = 3313.5778215997857

 Graphics mix information
 Concrete
Max in x=2.0 y=40.0,
Min in x=50.0 y=300.0,
 Steel
Max in x=100.0 y=250.0,
Min in x=50.0 y=400.0,
 Total
Max in x=150.0 y=250.0,
Min in x=50.0 y=400.0,
```

Example 2

A bridge in the north of UK was tested as a field test. The bridge was seen in need of possible repair, the visual inspection at first has been carried out, and some photographs where taken for location where the inspector thought an inspection or testing the condition on those specific locations is required, the following photographs are to give a general idea of the bridge's condition.

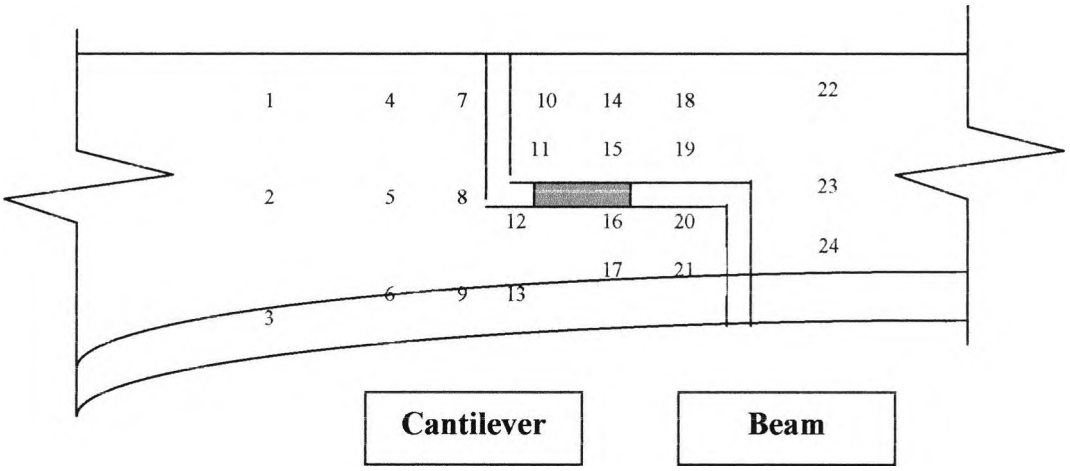


Following the visual inspection stage, some locations were selected to determine the condition of the structure. It was observed that the bridge from both sides behaves like a cantilever, and maybe what cause the middle part what rest on both sides of the structure to partially collapse. Therefore the inspector concentrate the investigation on those locations where believed to have the problems.
Some of the designs were provided to help determine and have more information about the structure, following the original reinforcements of the location where the inspector has carried NDT testing;



Both sides of the bridge were built in the same way and have the same sort of reinforcements.
A summary of concrete and reinforcement details can be given in the following table:

		Cantilever	beam
Surface Finish of Concrete		Smooth, damp, even finish	Smooth, damp, even finish
Orientation of Bar With Least Cover		Vertical	Vertical
Bar Diameter & Actual Cover	Vertical	5mm, 31mm	8.5mm, 38mm
	Horizontal	Not exposed	Not exposed
Bar Type	Vertical	Smooth, round	Smooth, round
	Horizontal	Not exposed	Not exposed
Condition	Vertical	Slight surface corrosion	Slight surface corrosion
	Horizontal	Not exposed	Not exposed
Average Minimum Cover using Covermeter		35mm	29mm



West Face of Cantilever/ Beam Intersection

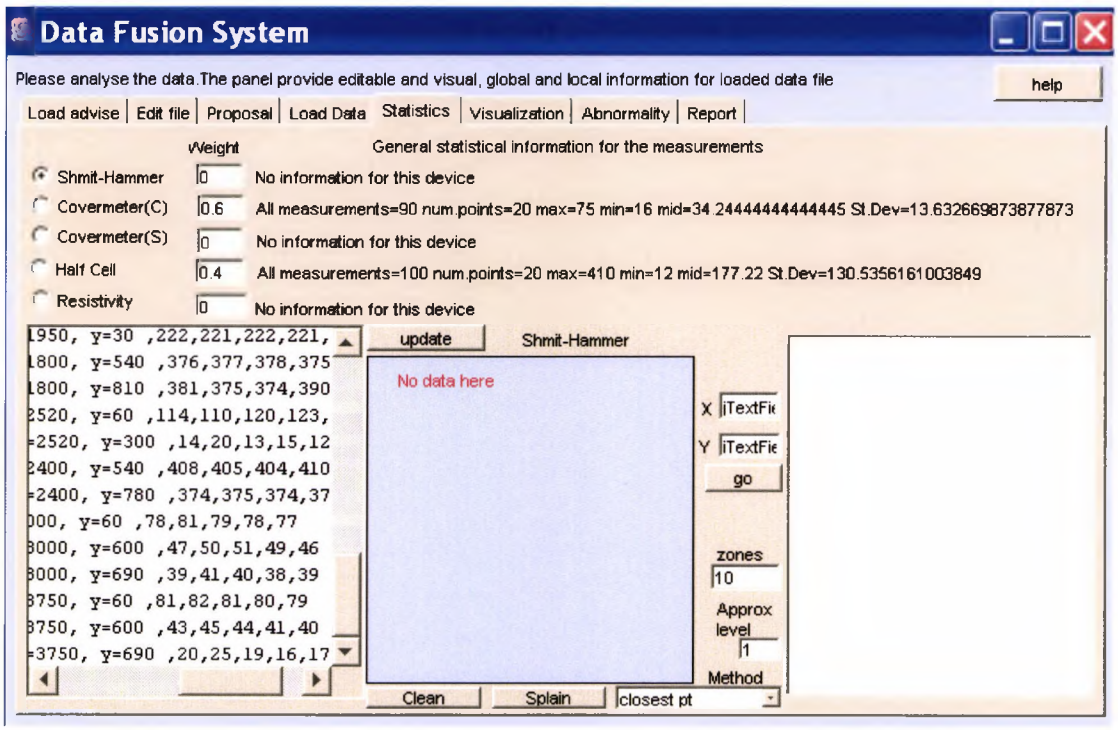
These six locations were chosen as examples to demonstrate the programme; the other section is identical but reversed, as it is for the other side of the bridge. The numbers in the section above is where the readings were taken in one of the locations, and the following results will include the readings and the NDT methods used for inspection, those were available on site. Each location will be indicated by its position and it will be treated individually;

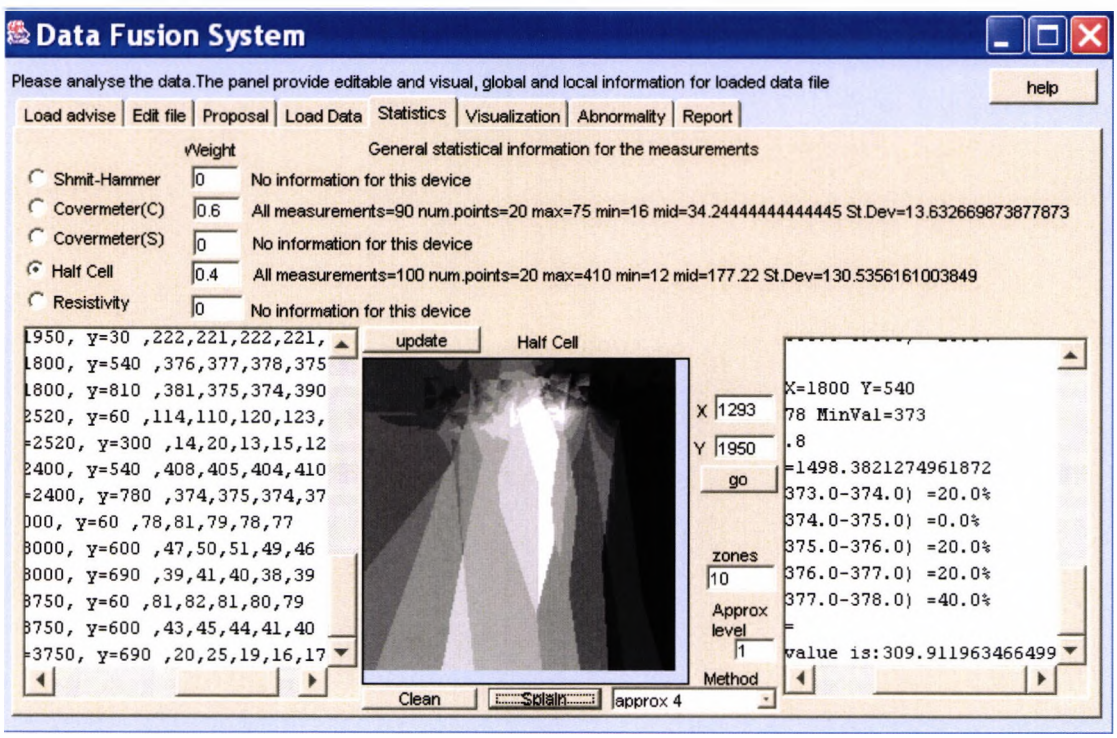
North 1

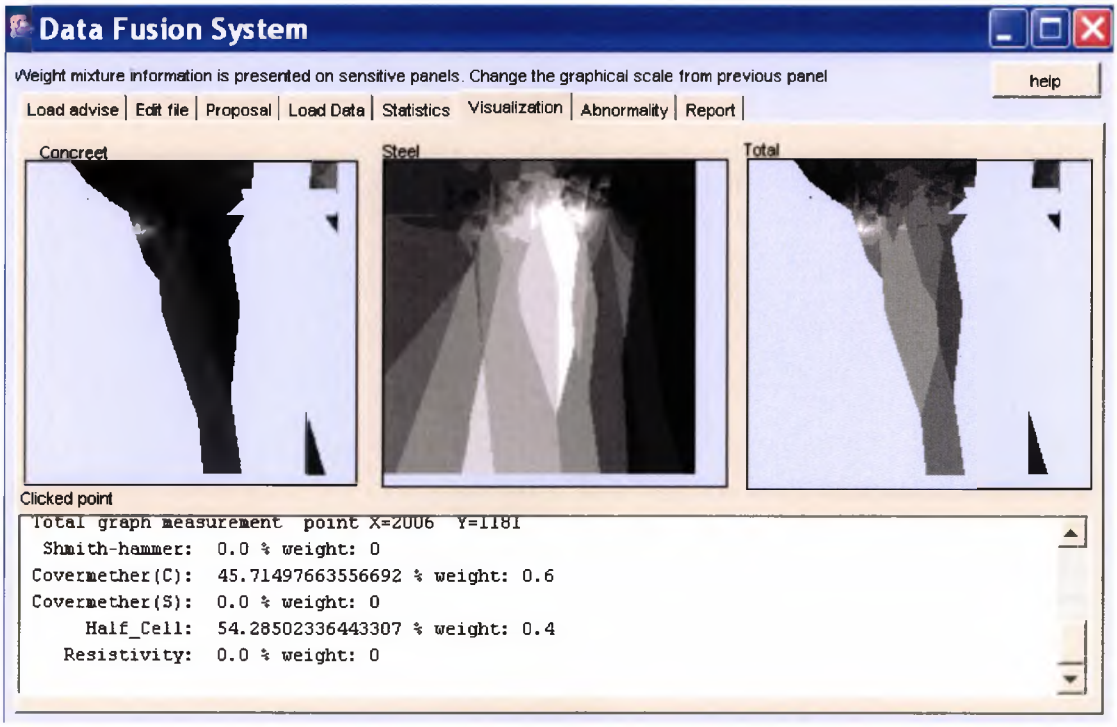
Point	X	Y	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5
1	750	60	28	29	30	27	27
2	750	450	18	17	18	19	17
3	750	900					
4	1350	60	28	28	27	30	26
5	1350	450	19	20	18	17	16
6	1350	840	72	75	70	71	69
7	1950	60	31	31	31	32	31
8	1950	30	34	33	33	35	35
9	1800	540	28	27	29	28	28
10	1800	810	23	24	24	22	21
11	2520	60	39	40	41	36	38
12	2520	300	42	41	40	44	40
13	2400	540	30	29	28	33	30
14	2400	780	24	25	26	23	22
15	3000	60	38	39	36	40	39
16	3000	600					
17	3000	690	29	30	31	32	28
18	3750	60	53	55	54	52	51
19	3750	600	56	55	56	54	57
20	3750	690	26	25	26	27	26

Half Cell

Point	X	Y	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5
1	750	60	182	183	180	185	179
2	750	450	85	86	87	84	85
3	750	900	188	188	188	189	187
4	1350	60	208	205	207	202	210
5	1350	450	138	140	140	137	135
6	1350	840	326	325	327	327	326
7	1950	60	219	220	220	219	218
8	1950	30	222	221	222	221	223
9	1800	540	376	377	378	375	373
10	1800	810	381	375	374	390	379
11	2520	60	114	110	120	123	111
12	2520	300	14	20	13	15	12
13	2400	540	408	405	404	410	409
14	2400	780	374	375	374	376	377
15	3000	60	78	81	79	78	77
16	3000	600	47	50	51	49	46
17	3000	690	39	41	40	38	39
18	3750	60	81	82	81	80	79
19	3750	600	43	45	44	41	40
20	3750	690	20	25	19	16	17


Data Fusion System
Please analyse the data.The panel provide editable and visual, global and local information for loaded data file
help
Load advise | Edit file | Proposal | Load Data | Statistics | Visualization | Abnormality | Report
Weight
General statistical information for the measurements
Shmit-Hammer 0 No information for this device
Covermeter(C) 0.6 All measurements=90 num.points=20 max=75 min=16 mid=34.24444444444445 St.Dev=13.632669873877873
Covermeter(S) 0 No information for this device
Half Cell 0.4 All measurements=100 num.points=20 max=410 min=12 mid=177.22 St.Dev=130.5356161003849
Resistivity 0 No information for this device
1950, y=30 ,222,221,222,221,
1800, y=540 ,376,377,378,375
1800, y=810 ,381,375,374,390
2520, y=60 ,114,110,120,123,
=2520, y=300 ,14,20,13,15,12
2400, y=540 ,408,405,404,410
=2400, y=780 ,374,375,374,37
000, y=60 ,78,81,79,78,77
3000, y=600 ,47,50,51,49,46
3000, y=690 ,39,41,40,38,39
3750, y=60 ,81,82,81,80,79
3750, y=600 ,43,45,44,41,40
=3750, y=690 ,20,25,19,16,17
update
Shmit-Hammer
No data here
X iTextFi
Y iTextFi
go
zones
10
Approx level
1
Method
Clean
Splain
closest pt


Data Fusion System
Please analyse the data.The panel provide editable and visual, global and local information for loaded data file
help
Load advise | Edit file | Proposal | Load Data | Statistics | Visualization | Abnormality | Report
Weight
General statistical information for the measurements
Shmit-Hammer 0 No information for this device
Covermeter(C) 0.6 All measurements=90 num.points=20 max=75 min=16 mid=34.24444444444445 St.Dev=13.632669873877873
Covermeter(S) 0 No information for this device
Half Cell 0.4 All measurements=100 num.points=20 max=410 min=12 mid=177.22 St.Dev=130.5356161003849
Resistivity 0 No information for this device
1950, y=30 ,222,221,222,221,
1800, y=540 ,376,377,378,375
1800, y=810 ,381,375,374,390
2520, y=60 ,114,110,120,123,
=2520, y=300 ,14,20,13,15,12
2400, y=540 ,408,405,404,410
=2400, y=780 ,374,375,374,37
000, y=60 ,78,81,79,78,77
3000, y=600 ,47,50,51,49,46
3000, y=690 ,39,41,40,38,39
3750, y=60 ,81,82,81,80,79
3750, y=600 ,43,45,44,41,40
=3750, y=690 ,20,25,19,16,17
update
Half Cell
X 1293
Y 1950
go
zones
10
Approx level
1
Method
Clean
Splain
approx 4
X=1800 Y=540
78 MinVal=373
.8
=1498.3821274961872
373.0-374.0) =20.0%
374.0-375.0) =0.0%
375.0-376.0) =20.0%
376.0-377.0) =20.0%
377.0-378.0) =40.0%
=
value is:309.911963466499


Data Fusion System
Weight mixture information is presented on sensitive panels. Change the graphical scale from previous panel
help
Load advise
Edit file
Proposal
Load Data
Statistics
Visualization
Abnormality
Report
Concreet
Steel
Total
Clicked point
Total graph measurement point X=2006 Y=1181
Shmith-hammer: 0.0 % weight: 0
Covermether(C): 45.71497663556692 % weight: 0.6
Covermether(S): 0.0 % weight: 0
Half_Cell: 54.28502336443307 % weight: 0.4
Resistivity: 0.0 % weight: 0

R E P O R T

1) The initial expert file is C:\Program Files\Ziad\data\Example.exp.
From the proposal options the expert result string is: Water reacts on resistivity increasing the values and increase risk of corrosion.
&0.0,0.6,0.0,0.4,0.0.

2) The data file with name C:\Program Files\Ziad\data\testdata.dat was loaded.
The working data are:
Covermeter(C)
1 (5) SD=1.3038404810405297, x=750, y=60 ,28,29,30,27,27
2 (5) SD=0.8366600265340756, x=750, y=450 ,18,17,18,19,17
3 (0) SD=-0.0, x=750, y=900
4 (5) SD=1.4832396974191326, x=1350, y=60 ,28,28,27,30,26
5 (5) SD=1.5811388300841898, x=1350, y=450 ,19,20,18,17,16
6 (5) SD=2.3021728866442674, x=1350, y=840 ,72,75,70,71,69
7 (5) SD=0.4472135954999579, x=1950, y=60 ,31,31,31,32,31
8 (5) SD=1.0, x=1950, y=30 ,34,33,33,35,35
9 (5) SD=0.7071067811865476, x=1800, y=540 ,28,27,29,28,28
10 (5) SD=1.3038404810405297, x=1800, y=810 ,23,24,24,22,21
11 (5) SD=1.9235384061671343, x=2520, y=60 ,39,40,41,36,38
12 (5) SD=1.6733200530681511, x=2520, y=300 ,42,41,40,44,40
13 (5) SD=1.8708286933869707, x=2400, y=540 ,30,29,28,33,30
14 (5) SD=1.5811388300841898, x=2400, y=780 ,24,25,26,23,22
15 (5) SD=1.51657508881031, x=3000, y=60 ,38,39,36,40,39
16 (0) SD=-0.0, x=3000, y=600
17 (5) SD=1.5811388300841898, x=3000, y=690 ,29,30,31,32,28
18 (5) SD=1.5811388300841898, x=3750, y=60 ,53,55,54,52,51
19 (5) SD=1.1401754250991378, x=3750, y=600 ,56,55,56,54,57
20 (5) SD=0.7071067811865476, x=3750, y=690 ,26,25,26,27,26
Half Cell
1 (5) SD=2.3874672772626644, x=750, y=60 ,182,183,180,185,179
2 (5) SD=1.140175425099138, x=750, y=450 ,85,86,87,84,85
3 (5) SD=0.7071067811865476, x=750, y=900 ,188,188,188,189,187
4 (5) SD=3.0495901363953815, x=1350, y=60 ,208,205,207,202,210
5 (5) SD=2.1213203435596424, x=1350, y=450 ,138,140,140,137,135
6 (5) SD=0.8366600265340756, x=1350, y=840 ,326,325,327,327,326
7 (5) SD=0.8366600265340756, x=1950, y=60 ,219,220,220,219,218
8 (5) SD=0.8366600265340756, x=1950, y=30 ,222,221,222,221,223
9 (5) SD=1.9235384061671346, x=1800, y=540 ,376,377,378,375,373
10 (5) SD=6.379655163094632, x=1800, y=810 ,381,375,374,390,379
11 (5) SD=5.683308895353129, x=2520, y=60 ,114,110,120,123,111
12 (5) SD=3.1144823004794873, x=2520, y=300 ,14,20,13,15,12
13 (5) SD=2.588435821108957, x=2400, y=540 ,408,405,404,410,409
14 (5) SD=1.3038404810405297, x=2400, y=780 ,374,375,374,376,377
15 (5) SD=1.51657508881031, x=3000, y=60 ,78,81,79,78,77
16 (5) SD=2.073644135332772, x=3000, y=600 ,47,50,51,49,46
17 (5) SD=1.140175425099138, x=3000, y=690 ,39,41,40,38,39
18 (5) SD=1.140175425099138, x=3750, y=60 ,81,82,81,80,79
19 (5) SD=2.073644135332772, x=3750, y=600 ,43,45,44,41,40
20 (5) SD=3.5071355833500366, x=3750, y=690 ,20,25,19,16,17.

3) The weights for the devices are:
0
0.6
0
0.4
0

4). Global analysis for the data show:

```
 Device 1: No information for this device
 Device 2: All measurements=90 num. points=20 max=75 min=16
mid=34.24444444444445 St. Dev=13.632669873877873
 Device 3: No information for this device
 Device 4: All measurements=100 num. points=20 max=410 min=12
mid=177.22 St. Dev=130.5356161003849
 Device 5: No information for this device

 5). provided experiments for particular points:
==============
Half Cell point: X=1293 Y=1950
The 4 closest points are:

 Point 1 X=1350 Y=840
 MaxVal=327 MinVal=325
 Mean=326.2
 Distance=1111.4625499763813
 Zone 1 (325.0-325.4) =20.0%
 Zone 2 (325.4-325.8) =0.0%
 Zone 3 (325.8-326.2) =40.0%
 Zone 4 (326.2-326.6) =0.0%
 Zone 5 (326.6-327.0) =40.0%

 Point 2 X=750 Y=900
 MaxVal=189 MinVal=187
 Mean=188.0
 Distance=1182.0951738333085
 Zone 1 (187.0-187.4) =20.0%
 Zone 2 (187.4-187.8) =0.0%
 Zone 3 (187.8-188.2) =60.0%
 Zone 4 (188.2-188.6) =0.0%
 Zone 5 (188.6-189.0) =20.0%

 Point 3 X=1800 Y=810
 MaxVal=390 MinVal=374
 Mean=379.8
 Distance=1247.6574048992777
 Zone 1 (374.0-377.2) =40.0%
 Zone 2 (377.2-380.4) =20.0%
 Zone 3 (380.4-383.6) =20.0%
 Zone 4 (383.6-386.8) =0.0%
 Zone 5 (386.8-390.0) =20.0%

 Point 4 X=1800 Y=540
 MaxVal=378 MinVal=373
 Mean=375.8
 Distance=1498.3821274961872
 Zone 1 (373.0-374.0) =20.0%
 Zone 2 (374.0-375.0) =0.0%
 Zone 3 (375.0-376.0) =20.0%
 Zone 4 (376.0-377.0) =20.0%
 Zone 5 (377.0-378.0) =40.0%
==========
 Approx. value is: 309.911963466499

 6). provided visualization point's checking analyse:

 Concrete graph measurement point X=2156  Y=1200
 Schmidt-Hammer data:  0.0 % weight: 0
     Covermeter(C):  100.0 % weight: 0.6
```

```
 Steel graph measurement point X=1331 Y=1837
 Covermeter(S):  0.0 % weight: 0
      Half-Cell:  100.0 % weight: 0.4
    Resistivity:  0.0 % weight: 0

 Total graph measurement point X=2006 Y=1181
  Schmidt-Hammer:  0.0 % weight: 0
 Covermeter(C):  45.71497663556692 % weight: 0.6
 Covermeter(S):  0.0 % weight: 0
      Half-Cell:  54.28502336443307 % weight: 0.4
    Resistivity:  0.0 % weight: 0
.

 7). Abnormality experiments:

-------- STANDART DEVIATION--------
SD in device: 1 = 13.632669873877873
SD in device: 3 = 130.5356161003849
------------------------
Big standard dev in device:3 = 130.5356161003849

 -------MAX/MIN-------
 Device 1
1 Max = 30 Min = 27
2 Max = 19 Min = 17
3 Max = -34565 Min = 34500
4 Max = 30 Min = 26
5 Max = 20 Min = 16
6 Max = 75 Min = 69
7 Max = 32 Min = 31
8 Max = 35 Min = 33
9 Max = 29 Min = 27
10 Max = 24 Min = 21
11 Max = 41 Min = 36
12 Max = 44 Min = 40
13 Max = 33 Min = 28
14 Max = 26 Min = 22
15 Max = 40 Min = 36
16 Max = -34565 Min = 34500
17 Max = 32 Min = 28
18 Max = 55 Min = 51
19 Max = 57 Min = 54
20 Max = 27 Min = 25
 ------------------
 Device 3
1 Max = 185 Min = 179
2 Max = 87 Min = 84
3 Max = 189 Min = 187
4 Max = 210 Min = 202
5 Max = 140 Min = 135
6 Max = 327 Min = 325
7 Max = 220 Min = 218
8 Max = 223 Min = 221
9 Max = 378 Min = 373
10 Max = 390 Min = 374
11 Max = 123 Min = 110
12 Max = 20 Min = 12
13 Max = 410 Min = 404
14 Max = 377 Min = 374
15 Max = 81 Min = 77
16 Max = 51 Min = 46
```

```
17 Max = 41 Min = 38
18 Max = 82 Min = 79
19 Max = 45 Min = 40
20 Max = 25 Min = 16
 ------------------
 ----WEIGHT----
 Device weight
 0     0
 1     0.6
 2     0
 3     0.4
 4     0
 Irrelevant data < > +-(1.0 * SD)+mean
 Device 1
1  x=  750  y=  750  (30)  mid=28.2  SD=1.3038404810405297  dev.  from
mean:1.8000000000000007
2  x=  750  y=  750  (19)  mid=17.8  SD=0.8366600265340756  dev.  from
mean:1.1999999999999993
4  x=  1350  y=  1350  (30)  mid=27.8  SD=1.4832396974191326  dev.  from
mean:2.1999999999999993
4  x=  1350  y=  1350  (26)  mid=27.8  SD=1.4832396974191326  dev.  from
mean:1.8000000000000007
5  x=  1350  y=  1350  (20)  mid=18.0  SD=1.5811388300841898  dev.  from
mean:2.0
5  x=  1350  y=  1350  (16)  mid=18.0  SD=1.5811388300841898  dev.  from
mean:2.0
6  x=  1350  y=  1350  (75)  mid=71.4  SD=2.3021728866442674  dev.  from
mean:3.5999999999999943
6  x=  1350  y=  1350  (69)  mid=71.4  SD=2.3021728866442674  dev.  from
mean:2.4000000000000057
7  x=  1950  y=  1950  (32)  mid=31.2  SD=0.4472135954999579  dev.  from
mean:0.8000000000000007
9  x=  1800  y=  1800  (27)  mid=28.0  SD=0.7071067811865476  dev.  from
mean:1.0
9  x=  1800  y=  1800  (29)  mid=28.0  SD=0.7071067811865476  dev.  from
mean:1.0
10  x=  1800  y=  1800  (21)  mid=22.8  SD=1.3038404810405297  dev.  from
mean:1.8000000000000007
11  x=  2520  y=  2520  (41)  mid=38.8  SD=1.9235384061671343  dev.  from
mean:2.200000000000003
11  x=  2520  y=  2520  (36)  mid=38.8  SD=1.9235384061671343  dev.  from
mean:2.799999999999997
12  x=  2520  y=  2520  (44)  mid=41.4  SD=1.6733200530681511  dev.  from
mean:2.6000000000000014
13  x=  2400  y=  2400  (28)  mid=30.0  SD=1.8708286933869707  dev.  from
mean:2.0
13  x=  2400  y=  2400  (33)  mid=30.0  SD=1.8708286933869707  dev.  from
mean:3.0
14  x=  2400  y=  2400  (26)  mid=24.0  SD=1.5811388300841898  dev.  from
mean:2.0
14  x=  2400  y=  2400  (22)  mid=24.0  SD=1.5811388300841898  dev.  from
mean:2.0
15  x=  3000  y=  3000  (36)  mid=38.4  SD=1.51657508881031  dev.  from
mean:2.3999999999999986
15  x=  3000  y=  3000  (40)  mid=38.4  SD=1.51657508881031  dev.  from
mean:1.6000000000000014
17  x=  3000  y=  3000  (32)  mid=30.0  SD=1.5811388300841898  dev.  from
mean:2.0
17  x=  3000  y=  3000  (28)  mid=30.0  SD=1.5811388300841898  dev.  from
mean:2.0
```

18 x= 3750 y= 3750 (55) mid=53.0 SD=1.5811388300841898 dev. from mean:2.0
18 x= 3750 y= 3750 (51) mid=53.0 SD=1.5811388300841898 dev. from mean:2.0
19 x= 3750 y= 3750 (54) mid=55.6 SD=1.1401754250991378 dev. from mean:1.6000000000000014
19 x= 3750 y= 3750 (57) mid=55.6 SD=1.1401754250991378 dev. from mean:1.3999999999999986
20 x= 3750 y= 3750 (25) mid=26.0 SD=0.7071067811865476 dev. from mean:1.0
20 x= 3750 y= 3750 (27) mid=26.0 SD=0.7071067811865476 dev. from mean:1.0
Device 3
1 x= 750 y= 750 (185) mid=181.8 SD=2.3874672772626644 dev. from mean:3.1999999999999886
1 x= 750 y= 750 (179) mid=181.8 SD=2.3874672772626644 dev. from mean:2.8000000000000114
2 x= 750 y= 750 (87) mid=85.4 SD=1.140175425099138 dev. from mean:1.5999999999999943
2 x= 750 y= 750 (84) mid=85.4 SD=1.140175425099138 dev. from mean:1.4000000000000057
3 x= 750 y= 750 (189) mid=188.0 SD=0.7071067811865476 dev. from mean:1.0
3 x= 750 y= 750 (187) mid=188.0 SD=0.7071067811865476 dev. from mean:1.0
4 x= 1350 y= 1350 (202) mid=206.4 SD=3.0495901363953815 dev. from mean:4.400000000000006
4 x= 1350 y= 1350 (210) mid=206.4 SD=3.0495901363953815 dev. from mean:3.5999999999999943
5 x= 1350 y= 1350 (135) mid=138.0 SD=2.1213203435596424 dev. from mean:3.0
6 x= 1350 y= 1350 (325) mid=326.2 SD=0.8366600265340756 dev. from mean:1.1999999999999886
7 x= 1950 y= 1950 (218) mid=219.2 SD=0.8366600265340756 dev. from mean:1.1999999999999886
8 x= 1950 y= 1950 (223) mid=221.8 SD=0.8366600265340756 dev. from mean:1.1999999999999886
9 x= 1800 y= 1800 (378) mid=375.8 SD=1.9235384061671346 dev. from mean:2.1999999999999886
9 x= 1800 y= 1800 (373) mid=375.8 SD=1.9235384061671346 dev. from mean:2.8000000000000114
10 x= 1800 y= 1800 (390) mid=379.8 SD=6.379655163094632 dev. from mean:10.199999999999989
11 x= 2520 y= 2520 (123) mid=115.6 SD=5.683308895353129 dev. from mean:7.400000000000006
12 x= 2520 y= 2520 (20) mid=14.8 SD=3.1144823004794873 dev. from mean:5.199999999999999
13 x= 2400 y= 2400 (404) mid=407.2 SD=2.588435821108957 dev. from mean:3.1999999999999886
13 x= 2400 y= 2400 (410) mid=407.2 SD=2.588435821108957 dev. from mean:2.8000000000000114
14 x= 2400 y= 2400 (377) mid=375.2 SD=1.3038404810405297 dev. from mean:1.8000000000000114
15 x= 3000 y= 3000 (81) mid=78.6 SD=1.51657508881031 dev. from mean:2.4000000000000057
15 x= 3000 y= 3000 (77) mid=78.6 SD=1.51657508881031 dev. from mean:1.5999999999999943
16 x= 3000 y= 3000 (51) mid=48.6 SD=2.073644135332772 dev. from mean:2.3999999999999986
16 x= 3000 y= 3000 (46) mid=48.6 SD=2.073644135332772 dev. from mean:2.6000000000000014

```
17 x= 3000 y= 3000 (41) mid=39.4 SD=1.140175425099138 dev. from
mean:1.6000000000000014
17 x= 3000 y= 3000 (38) mid=39.4 SD=1.140175425099138 dev. from
mean:1.3999999999999986
18 x= 3750 y= 3750 (82) mid=80.6 SD=1.140175425099138 dev. from
mean:1.4000000000000057
18 x= 3750 y= 3750 (79) mid=80.6 SD=1.140175425099138 dev. from
mean:1.5999999999999943
19 x= 3750 y= 3750 (45) mid=42.6 SD=2.073644135332772 dev. from
mean:2.3999999999999986
19 x= 3750 y= 3750 (40) mid=42.6 SD=2.073644135332772 dev. from
mean:2.6000000000000014
20 x= 3750 y= 3750 (25) mid=19.4 SD=3.5071355833500366 dev. from
mean:5.600000000000001
 Graphics mix information
 Concrete
max in x=1350.0 y=825.0,
min in x=750.0 y=450.0,
 Steel
max in x=2400.0 y=543.75,
min in x=3750.0 y=693.75,
 Total
max in x=1350.0 y=843.75,
min in x=750.0 y=450.0,
```

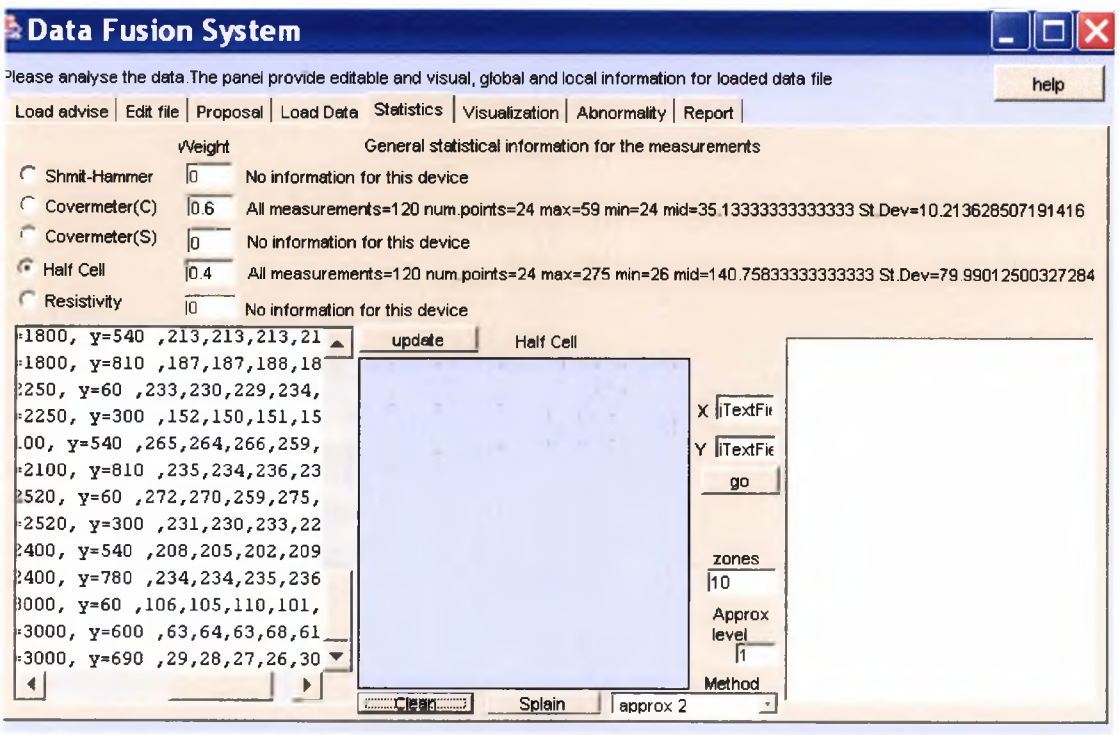
North 2

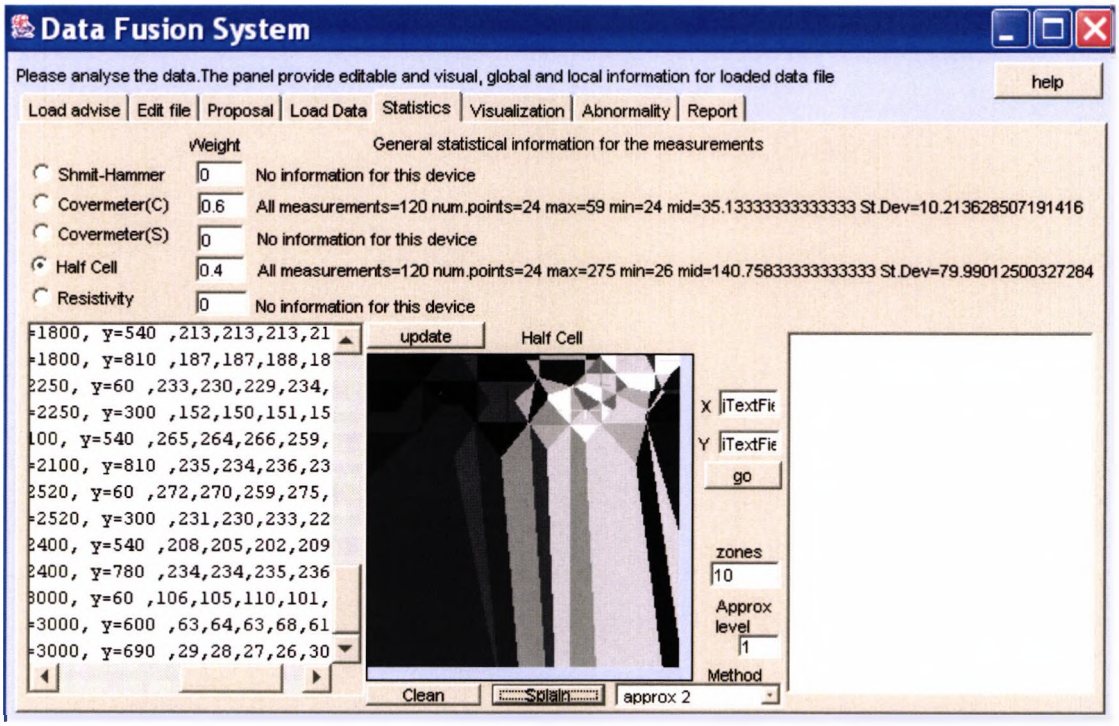
Covermeter

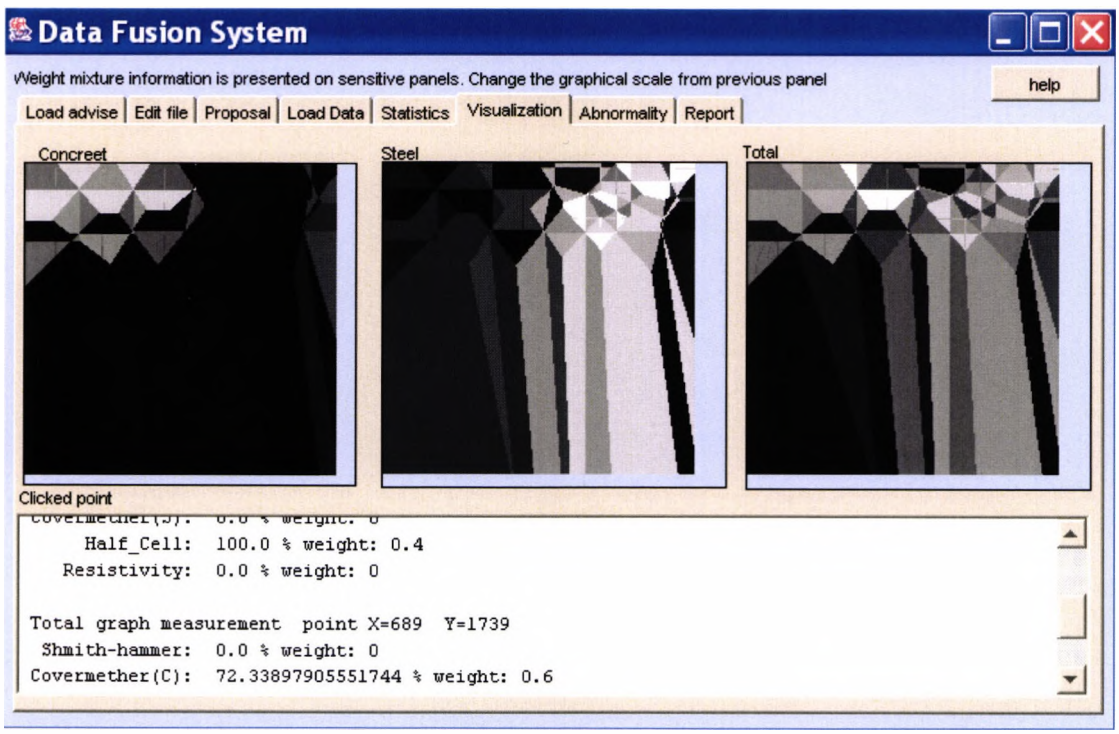
Point	X	Y	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5
1	300	60	56	55	57	54	58
2	300	450	45	44	45	46	49
3	300	1050	29	30	28	27	32
4	750	60	56	55	57	59	51
5	750	450	48	48	49	48	47
6	750	900	28	29	29	27	27
7	1350	60	55	55	54	56	57
8	1350	450	43	42	41	49	40
9	1350	840	27	30	32	25	26
10	1950	60	26	25	24	25	28
11	1950	30	29	29	28	30	31
12	1800	540	31	30	28	30	31
13	1800	810	26	27	28	25	28
14	2250	60	27	29	25	24	30
15	2250	300	30	29	28	31	32
16	2100	540	28	26	30	27	28
17	2100	810	28	29	27	25	30
18	2520	60	30	29	25	35	29
19	2520	300	31	30	36	29	31
20	2400	540	26	25	27	28	24
21	2400	780	28	25	30	25	29
22	3000	60	40	40	40	41	42
23	3000	600	42	40	39	39	40
24	3000	690	34	35	36	32	37

Half Cell

Point	X	Y	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5
1	300	60	32	33	35	30	32
2	300	450	64	65	66	64	67
3	300	1050	98	101	99	97	98
4	750	60	48	51	49	48	47
5	750	450	86	89	87	85	84
6	750	900	78	77	79	78	78
7	1350	60	110	110	110	108	111
8	1350	450	51	50	53	49	49
9	1350	840	105	104	106	101	107
10	1950	60	211	210	220	209	204
11	1950	30	73	74	78	73	69
12	1800	540	213	213	213	214	211
13	1800	810	187	187	188	187	186
14	2250	60	233	230	229	234	235
15	2250	300	152	150	151	154	149
16	2100	540	265	264	266	259	270
17	2100	810	235	234	236	235	234
18	2520	60	272	270	259	275	274
19	2520	300	231	230	233	229	228
20	2400	540	208	205	202	209	210
21	2400	780	234	234	235	236	229
22	3000	60	106	105	110	101	103
23	3000	600	63	64	63	68	61
24	3000	690	29	28	27	26	30




Data Fusion System
Please analyse the data.The panel provide editable and visual, global and local information for loaded data file
help
Load advise
Edit file
Proposal
Load Data
Statistics
Visualization
Abnormality
Report
Weight
General statistical information for the measurements
Shmit-Hammer
0
No information for this device
Covermeter(C)
0.6
All measurements=120 num.points=24 max=59 min=24 mid=35.13333333333333 St.Dev=10.213628507191416
Covermeter(S)
0
No information for this device
Half Cell
0.4
All measurements=120 num.points=24 max=275 min=26 mid=140.75833333333333 St.Dev=79.99012500327284
Resistivity
0
No information for this device
update
Half Cell
X
Y
go
zones
10
Approx level
1
Method
Clean
Splain
approx 2


Data Fusion System
Weight mixture information is presented on sensitive panels. Change the graphical scale from previous panel
help
Load advise
Edit file
Proposal
Load Data
Statistics
Visualization
Abnormality
Report
Concreet
Steel
Total
Clicked point
Half_Cell: 100.0 % weight: 0.4
Resistivity: 0.0 % weight: 0
Total graph measurement point X=689 Y=1739
Shmith-hammer: 0.0 % weight: 0
Covermether(C): 72.33897905551744 % weight: 0.6

R E P O R T

1) The initial expert file is C:\Program Files\Ziad\data\Example.exp.
From the proposal options the expert result string is: Water reacts on resistivity increasing the values and increase risk of corrosion.
&0.0,0.6,0.0,0.4,0.0.

2) The data file with name C:\Program Files\Ziad\data\testdata.dat was loaded.
The working data are:
Covermeter(C)
1 (5) SD=1.5811388300841898, x=300, y=60 ,56,55,57,54,58
2 (5) SD=1.9235384061671343, x=300, y=450 ,45,44,45,46,49
3 (5) SD=1.9235384061671346, x=300, y=1050 ,29,30,28,27,32
4 (5) SD=2.9664793948382653, x=750, y=60 ,56,55,57,59,51
5 (5) SD=0.7071067811865476, x=750, y=450 ,48,48,49,48,47
6 (5) SD=1.0, x=750, y=900 ,28,29,29,27,27
7 (5) SD=1.1401754250991378, x=1350, y=60 ,55,55,54,56,57
8 (5) SD=3.5355339059327378, x=1350, y=450 ,43,42,41,49,40
9 (5) SD=2.9154759474226504, x=1350, y=840 ,27,30,32,25,26
10 (5) SD=1.51657508881031, x=1950, y=60 ,26,25,24,25,28
11 (5) SD=1.1401754250991378, x=1950, y=30 ,29,29,28,30,31
12 (5) SD=1.224744871391589, x=1800, y=540 ,31,30,28,30,31
13 (5) SD=1.3038404810405297, x=1800, y=810 ,26,27,28,25,28
14 (5) SD=2.5495097567963922, x=2250, y=60 ,27,29,25,24,30
15 (5) SD=1.5811388300841898, x=2250, y=300 ,30,29,28,31,32
16 (5) SD=1.4832396974191324, x=2100, y=540 ,28,26,30,27,28
17 (5) SD=1.9235384061671346, x=2100, y=810 ,28,29,27,25,30
18 (5) SD=3.5777087639996634, x=2520, y=60 ,30,29,25,35,29
19 (5) SD=2.701851217221259, x=2520, y=300 ,31,30,36,29,31
20 (5) SD=1.5811388300841898, x=2400, y=540 ,26,25,27,28,24
21 (5) SD=2.302172886644268, x=2400, y=780 ,28,25,30,25,29
22 (5) SD=0.8944271909999159, x=3000, y=60 ,40,40,40,41,42
23 (5) SD=1.224744871391589, x=3000, y=600 ,42,40,39,39,40
24 (5) SD=1.9235384061671343, x=3000, y=690 ,34,35,36,32,37
Half Cell
1 (5) SD=1.8165902124584952, x=300, y=60 ,32,33,35,30,32
2 (5) SD=1.3038404810405297, x=300, y=450 ,64,65,66,64,67
3 (5) SD=1.51657508881031, x=300, y=1050 ,98,101,99,97,98
4 (5) SD=1.5165750888103102, x=750, y=60 ,48,51,49,48,47
5 (5) SD=1.9235384061671343, x=750, y=450 ,86,89,87,85,84
6 (5) SD=0.7071067811865476, x=750, y=900 ,78,77,79,78,78
7 (5) SD=1.0954451150103321, x=1350, y=60 ,110,110,110,108,111
8 (5) SD=1.6733200530681511, x=1350, y=450 ,51,50,53,49,49
9 (5) SD=2.3021728866442674, x=1350, y=840 ,105,104,106,101,107
10 (5) SD=5.805170109479997, x=1950, y=60 ,211,210,220,209,204
11 (5) SD=3.209361307176242, x=1950, y=30 ,73,74,78,73,69
12 (5) SD=1.0954451150103321, x=1800, y=540 ,213,213,213,214,211
13 (5) SD=0.7071067811865476, x=1800, y=810 ,187,187,188,187,186
14 (5) SD=2.588435821108957, x=2250, y=60 ,233,230,229,234,235
15 (5) SD=1.9235384061671346, x=2250, y=300 ,152,150,151,154,149
16 (5) SD=3.96232255123179, x=2100, y=540 ,265,264,266,259,270
17 (5) SD=0.8366600265340756, x=2100, y=810 ,235,234,236,235,234
18 (5) SD=6.442049363362563, x=2520, y=60 ,272,270,259,275,274
19 (5) SD=1.9235384061671346, x=2520, y=300 ,231,230,233,229,228
20 (5) SD=3.271085446759225, x=2400, y=540 ,208,205,202,209,210
21 (5) SD=2.701851217221259, x=2400, y=780 ,234,234,235,236,229
22 (5) SD=3.391164991562634, x=3000, y=60 ,106,105,110,101,103
23 (5) SD=2.5884358211089573, x=3000, y=600 ,63,64,63,68,61
24 (5) SD=1.5811388300841898, x=3000, y=690 ,29,28,27,26,30.

```
 3) The weights for the devices are:
0
0.6
0
0.4
0

 4). Global analysis for the data show:
 Device 1: No information for this device
 Device 2: All measurements=120 num. points=24 max=59 min=24
mid=35.13333333333333 St. Dev=10.213628507191416
 Device 3: No information for this device
 Device 4: All measurements=120 num. points=24 max=275 min=26
mid=140.75833333333333 St. Dev=79.99012500327284
 Device 5: No information for this device

 5) Provided experiments for particular points:

 6) Provided visualization point's checking analyse:

 Concrete graph measurement point X=1604 Y=1214
 Schmidt-Hammer data:  0.0 % weight: 0
     Covermeter(C):  100.0 % weight: 0.6

 Steel graph measurement point X=929 Y=1559
 Covermeter(S):  0.0 % weight: 0
      Half-Cell:  100.0 % weight: 0.4
    Resistivity:  0.0 % weight: 0

 Total graph measurement point X=689 Y=1739
  Schmidt-Hammer:  0.0 % weight: 0
 Covermeter(C):  72.33897905551744 % weight: 0.6
 Covermeter(S):  0.0 % weight: 0
      Half-Cell:  27.661020944482555 % weight: 0.4
    Resistivity:  0.0 % weight: 0


 7). Abnormality experiments:

-------- STANDART DEVIATION--------
SD in device: 1 = 10.213628507191416
SD in device: 3 = 79.99012500327284
------------------------
Big standard dev in device: 3 = 79.99012500327284

 -------MAX/MIN-------
 Device 1
1 Max = 58 Min = 54
2 Max = 49 Min = 44
3 Max = 32 Min = 27
4 Max = 59 Min = 51
5 Max = 49 Min = 47
6 Max = 29 Min = 27
7 Max = 57 Min = 54
8 Max = 49 Min = 40
9 Max = 32 Min = 25
10 Max = 28 Min = 24
11 Max = 31 Min = 28
12 Max = 31 Min = 28
13 Max = 28 Min = 25
14 Max = 30 Min = 24
```

```
15 Max = 32 Min = 28
16 Max = 30 Min = 26
17 Max = 30 Min = 25
18 Max = 35 Min = 25
19 Max = 36 Min = 29
20 Max = 28 Min = 24
21 Max = 30 Min = 25
22 Max = 42 Min = 40
23 Max = 42 Min = 39
24 Max = 37 Min = 32
 ------------------
 Device 3
1 Max = 35 Min = 30
2 Max = 67 Min = 64
3 Max = 101 Min = 97
4 Max = 51 Min = 47
5 Max = 89 Min = 84
6 Max = 79 Min = 77
7 Max = 111 Min = 108
8 Max = 53 Min = 49
9 Max = 107 Min = 101
10 Max = 220 Min = 204
11 Max = 78 Min = 69
12 Max = 214 Min = 211
13 Max = 188 Min = 186
14 Max = 235 Min = 229
15 Max = 154 Min = 149
16 Max = 270 Min = 259
17 Max = 236 Min = 234
18 Max = 275 Min = 259
19 Max = 233 Min = 228
20 Max = 210 Min = 202
21 Max = 236 Min = 229
22 Max = 110 Min = 101
23 Max = 68 Min = 61
24 Max = 30 Min = 26
 ------------------
 ----WEIGHT----
 Device weight
 0      0
 1      0.6
 2      0
 3      0.4
 4      0
 Irrelevant data < > +-(1.0 * SD) +mean
 Device 1
1 x= 300 y= 300 (54) mid=56.0 SD=1.5811388300841898 dev. from mean:
2.0
1 x= 300 y= 300 (58) mid=56.0 SD=1.5811388300841898 dev. from mean:
2.0
2 x= 300 y= 300 (49) mid=45.8 SD=1.9235384061671343 dev. from mean:
3.200000000000003
3 x= 300 y= 300 (27) mid=29.2 SD=1.9235384061671346 dev. from mean:
2.1999999999999993
3 x= 300 y= 300 (32) mid=29.2 SD=1.9235384061671346 dev. from mean:
2.8000000000000007
4 x= 750 y= 750 (59) mid=55.6 SD=2.9664793948382653 dev. from mean:
3.3999999999999986
4 x= 750 y= 750 (51) mid=55.6 SD=2.9664793948382653 dev. from mean:
4.600000000000001
```

5 x= 750 y= 750 (49) mid=48.0 SD=0.7071067811865476 dev. from mean:1.0
5 x= 750 y= 750 (47) mid=48.0 SD=0.7071067811865476 dev. from mean:1.0
7 x= 1350 y= 1350 (54) mid=55.4 SD=1.1401754250991378 dev. from mean:1.3999999999999986
7 x= 1350 y= 1350 (57) mid=55.4 SD=1.1401754250991378 dev. from mean:1.6000000000000014
8 x= 1350 y= 1350 (49) mid=43.0 SD=3.5355339059327378 dev. from mean:6.0
9 x= 1350 y= 1350 (32) mid=28.0 SD=2.9154759474226504 dev. from mean:4.0
9 x= 1350 y= 1350 (25) mid=28.0 SD=2.9154759474226504 dev. from mean:3.0
10 x= 1950 y= 1950 (24) mid=25.6 SD=1.51657508881031 dev. from mean:1.6000000000000014
10 x= 1950 y= 1950 (28) mid=25.6 SD=1.51657508881031 dev. from mean:2.3999999999999986
11 x= 1950 y= 1950 (28) mid=29.4 SD=1.1401754250991378 dev. from mean:1.3999999999999986
11 x= 1950 y= 1950 (31) mid=29.4 SD=1.1401754250991378 dev. from mean:1.6000000000000014
12 x= 1800 y= 1800 (28) mid=30.0 SD=1.224744871391589 dev. from mean:2.0
13 x= 1800 y= 1800 (25) mid=26.8 SD=1.3038404810405297 dev. from mean:1.8000000000000007
14 x= 2250 y= 2250 (24) mid=27.0 SD=2.5495097567963922 dev. from mean:3.0
14 x= 2250 y= 2250 (30) mid=27.0 SD=2.5495097567963922 dev. from mean:3.0
15 x= 2250 y= 2250 (28) mid=30.0 SD=1.5811388300841898 dev. from mean:2.0
15 x= 2250 y= 2250 (32) mid=30.0 SD=1.5811388300841898 dev. from mean:2.0
16 x= 2100 y= 2100 (26) mid=27.8 SD=1.4832396974191324 dev. from mean:1.8000000000000007
16 x= 2100 y= 2100 (30) mid=27.8 SD=1.4832396974191324 dev. from mean:2.1999999999999993
17 x= 2100 y= 2100 (25) mid=27.8 SD=1.9235384061671346 dev. from mean:2.8000000000000007
17 x= 2100 y= 2100 (30) mid=27.8 SD=1.9235384061671346 dev. from mean:2.1999999999999993
18 x= 2520 y= 2520 (25) mid=29.6 SD=3.5777087639996634 dev. from mean:4.600000000000001
18 x= 2520 y= 2520 (35) mid=29.6 SD=3.5777087639996634 dev. from mean:5.399999999999999
19 x= 2520 y= 2520 (36) mid=31.4 SD=2.701851217221259 dev. from mean:4.600000000000001
20 x= 2400 y= 2400 (28) mid=26.0 SD=1.5811388300841898 dev. from mean:2.0
20 x= 2400 y= 2400 (24) mid=26.0 SD=1.5811388300841898 dev. from mean:2.0
21 x= 2400 y= 2400 (25) mid=27.4 SD=2.302172886644268 dev. from mean:2.3999999999999986
21 x= 2400 y= 2400 (30) mid=27.4 SD=2.302172886644268 dev. from mean:2.6000000000000014
21 x= 2400 y= 2400 (25) mid=27.4 SD=2.302172886644268 dev. from mean:2.3999999999999986
22 x= 3000 y= 3000 (42) mid=40.6 SD=0.8944271909999159 dev. from mean:1.3999999999999986

23 x= 3000 y= 3000 (42) mid=40.0 SD=1.224744871391589 dev. from mean:2.0
24 x= 3000 y= 3000 (32) mid=34.8 SD=1.9235384061671343 dev. from mean:2.799999999999997
24 x= 3000 y= 3000 (37) mid=34.8 SD=1.9235384061671343 dev. from mean:2.200000000000003
Device 3
1 x= 300 y= 300 (35) mid=32.4 SD=1.8165902124584952 dev. from mean:2.6000000000000014
1 x= 300 y= 300 (30) mid=32.4 SD=1.8165902124584952 dev. from mean:2.3999999999999986
2 x= 300 y= 300 (67) mid=65.2 SD=1.3038404810405297 dev. from mean:1.7999999999999972
3 x= 300 y= 300 (101) mid=98.6 SD=1.51657508881031 dev. from mean:2.4000000000000057
3 x= 300 y= 300 (97) mid=98.6 SD=1.51657508881031 dev. from mean:1.5999999999999943
4 x= 750 y= 750 (51) mid=48.6 SD=1.5165750888103102 dev. from mean:2.3999999999999986
4 x= 750 y= 750 (47) mid=48.6 SD=1.5165750888103102 dev. from mean:1.6000000000000014
5 x= 750 y= 750 (89) mid=86.2 SD=1.9235384061671343 dev. from mean:2.799999999999997
5 x= 750 y= 750 (84) mid=86.2 SD=1.9235384061671343 dev. from mean:2.200000000000003
6 x= 750 y= 750 (77) mid=78.0 SD=0.7071067811865476 dev. from mean:1.0
6 x= 750 y= 750 (79) mid=78.0 SD=0.7071067811865476 dev. from mean:1.0
7 x= 1350 y= 1350 (108) mid=109.8 SD=1.0954451150103321 dev. from mean:1.7999999999999972
7 x= 1350 y= 1350 (111) mid=109.8 SD=1.0954451150103321 dev. from mean:1.2000000000000028
8 x= 1350 y= 1350 (53) mid=50.4 SD=1.6733200530681511 dev. from mean:2.6000000000000014
9 x= 1350 y= 1350 (101) mid=104.6 SD=2.3021728866442674 dev. from mean:3.5999999999999943
9 x= 1350 y= 1350 (107) mid=104.6 SD=2.3021728866442674 dev. from mean:2.4000000000000057
10 x= 1950 y= 1950 (220) mid=210.8 SD=5.805170109479997 dev. from mean:9.199999999999989
10 x= 1950 y= 1950 (204) mid=210.8 SD=5.805170109479997 dev. from mean:6.800000000000011
11 x= 1950 y= 1950 (78) mid=73.4 SD=3.209361307176242 dev. from mean:4.599999999999994
11 x= 1950 y= 1950 (69) mid=73.4 SD=3.209361307176242 dev. from mean:4.400000000000006
12 x= 1800 y= 1800 (214) mid=212.8 SD=1.0954451150103321 dev. from mean:1.1999999999999886
12 x= 1800 y= 1800 (211) mid=212.8 SD=1.0954451150103321 dev. from mean:1.8000000000000114
13 x= 1800 y= 1800 (188) mid=187.0 SD=0.7071067811865476 dev. from mean:1.0
13 x= 1800 y= 1800 (186) mid=187.0 SD=0.7071067811865476 dev. from mean:1.0
14 x= 2250 y= 2250 (229) mid=232.2 SD=2.588435821108957 dev. from mean:3.1999999999999886
14 x= 2250 y= 2250 (235) mid=232.2 SD=2.588435821108957 dev. from mean:2.8000000000000114
15 x= 2250 y= 2250 (154) mid=151.2 SD=1.9235384061671346 dev. from mean:2.8000000000000114

```
15 x= 2250 y= 2250 (149) mid=151.2 SD=1.9235384061671346 dev. from
mean:2.1999999999999886
16 x= 2100 y= 2100 (259) mid=264.8 SD=3.96232255123179 dev. from
mean:5.800000000000011
16 x= 2100 y= 2100 (270) mid=264.8 SD=3.96232255123179 dev. from
mean:5.199999999999989
17 x= 2100 y= 2100 (236) mid=234.8 SD=0.8366600265340756 dev. from
mean:1.1999999999999886
18 x= 2520 y= 2520 (259) mid=270.0 SD=6.442049363362563 dev. from
mean:11.0
19 x= 2520 y= 2520 (233) mid=230.2 SD=1.9235384061671346 dev. from
mean:2.8000000000000114
19 x= 2520 y= 2520 (228) mid=230.2 SD=1.9235384061671346 dev. from
mean:2.1999999999999886
20 x= 2400 y= 2400 (202) mid=206.8 SD=3.271085446759225 dev. from
mean:4.800000000000011
21 x= 2400 y= 2400 (229) mid=233.6 SD=2.701851217221259 dev. from
mean:4.599999999999994
22 x= 3000 y= 3000 (110) mid=105.0 SD=3.391164991562634 dev. from
mean:5.0
22 x= 3000 y= 3000 (101) mid=105.0 SD=3.391164991562634 dev. from
mean:4.0
23 x= 3000 y= 3000 (68) mid=63.8 SD=2.5884358211089573 dev. from
mean:4.200000000000003
23 x= 3000 y= 3000 (61) mid=63.8 SD=2.5884358211089573 dev. from
mean:2.799999999999997
24 x= 3000 y= 3000 (26) mid=28.0 SD=1.5811388300841898 dev. from
mean:2.0
24 x= 3000 y= 3000 (30) mid=28.0 SD=1.5811388300841898 dev. from
mean:2.0
 Graphics mix information
 Concrete
max in x=540.0 y=224.99998,
min in x=1844.9999 y=14.999999,
 Steel
max in x=2759.9998 y=329.99997,
min in x=2714.9998 y=1394.9999,
 Total
max in x=1004.99994 y=179.99998,
min in x=2684.9998 y=944.99994,
```

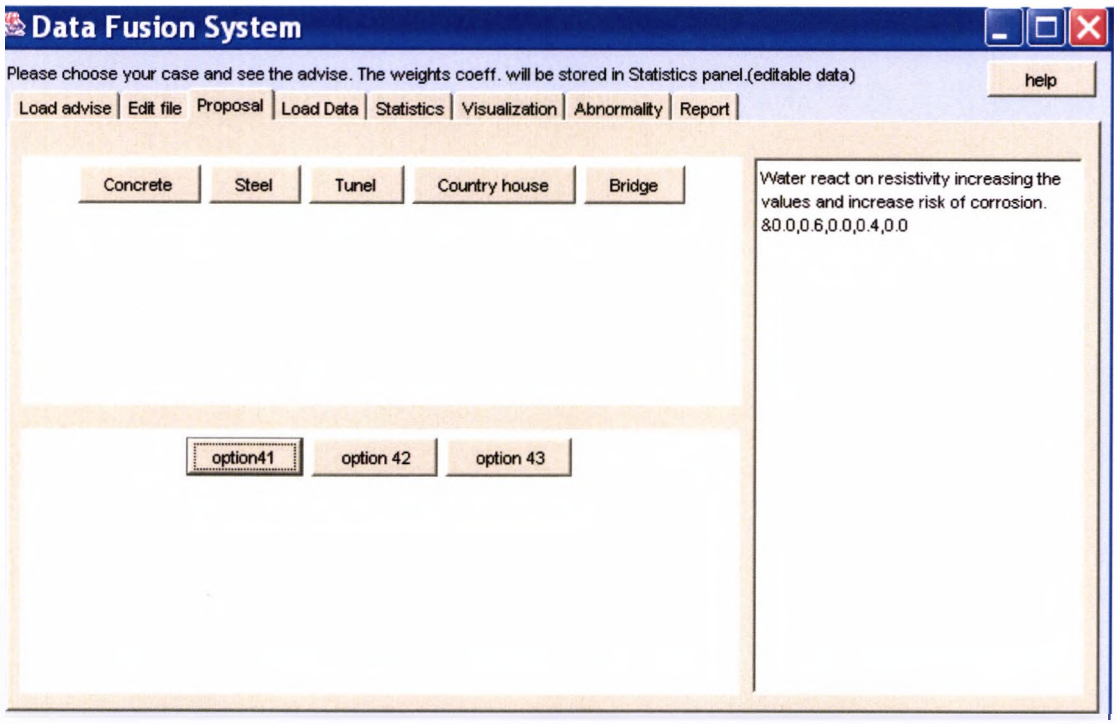
North 6

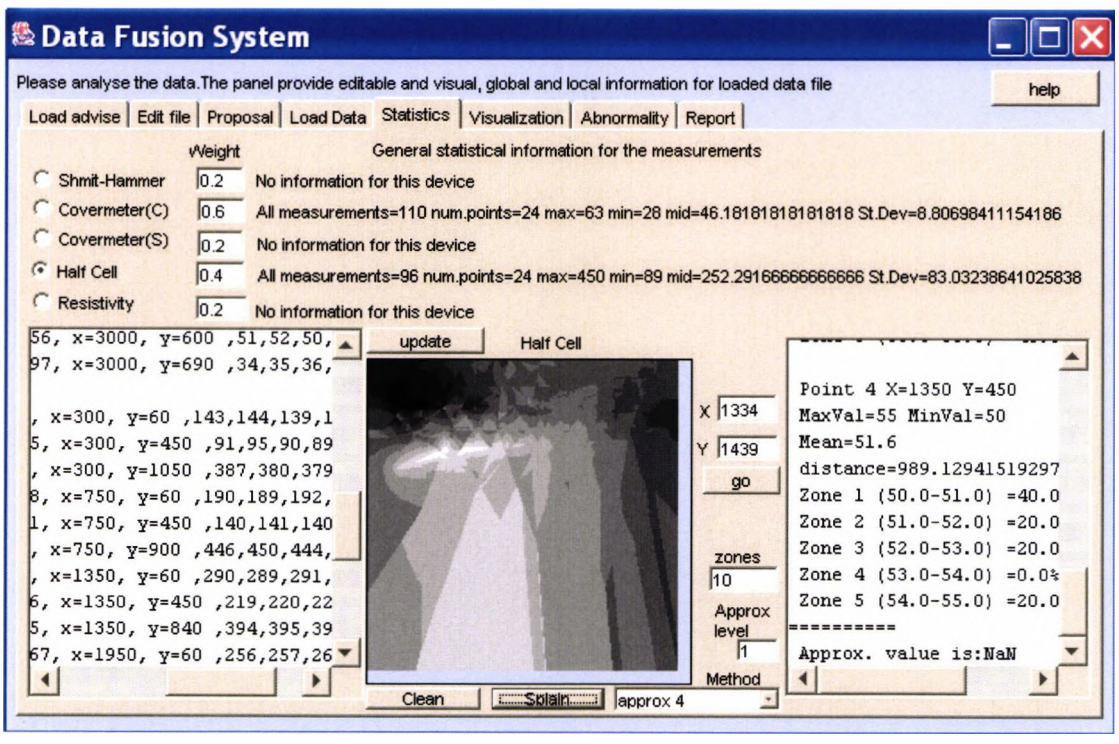
Covermeter(C)

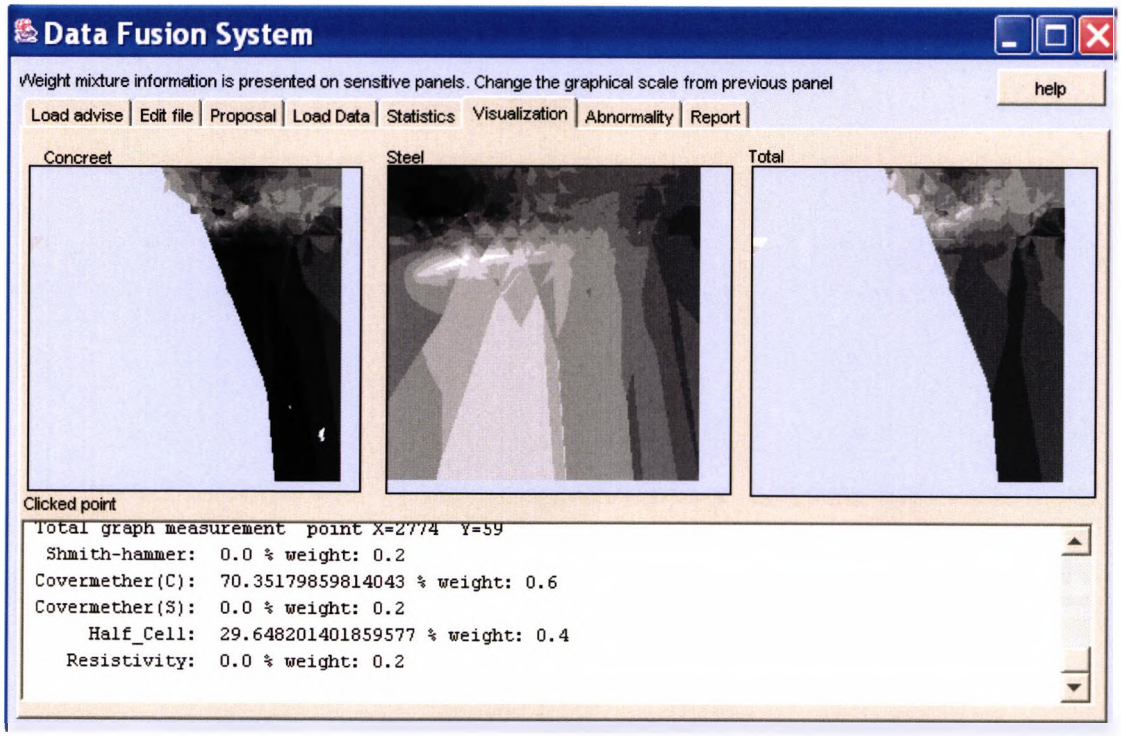
Point	X	Y	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5
1	300	60	53	53	55	50	49
2	300	450	58	53	60	54	59
3	300	1050	59	60	58	63	56
4	750	60	58	53	59	60	56
5	750	450					
6	750	900	53	52	49	55	54
7	1350	60	45	55	51	49	55
8	1350	450	51	55	52	50	50
9	1350	840					
10	1950	60	36	32	35	38	34
11	1950	30	42	40	37	42	40
12	1800	540	53	54	53	55	51
13	1800	810	30	32	31	29	30
14	2250	60	41	42	40	43	39
15	2250	300	52	55	46	49	53
16	2100	540	42	42	45	40	41
17	2100	810	32	32	33	31	28
18	2520	60	46	47	45	46	45
19	2520	300	51	50	52	52	50
20	2400	540	47	45	49	45	49
21	2400	780	35	38	32	32	38
22	3000	60	48	46	49	46	48
23	3000	600	51	52	50	51	52
24	3000	690	34	35	36	33	33

Half Cell

Point	X	Y	Reading 1	Reading 2	Reading 3	Reading 4
1	300	60	143	144	139	149
2	300	450	91	95	90	89
3	300	1050	387	380	379	390
4	750	60	190	189	192	193
5	750	450	140	141	140	143
6	750	900	446	450	444	442
7	1350	60	290	289	291	290
8	1350	450	219	220	221	218
9	1350	840	394	395	390	396
10	1950	60	256	257	260	261
11	1950	30	227	228	230	225
12	1800	540	275	275	276	280
13	1800	810	339	340	341	338
14	2250	60	259	260	258	261
15	2250	300	262	260	261	263
16	2100	540	292	290	295	296
17	2100	810	316	318	320	325
18	2520	60	256	255	254	250
19	2520	300	202	200	199	205
20	2400	540	222	214	225	226
21	2400	780	268	269	270	267
22	3000	60	214	215	214	217
23	3000	600	206	204	210	209
24	3000	690	152	151	150	153


Data Fusion System
Please choose your case and see the advise. The weights coeff. will be stored in Statistics panel.(editable data)
help
Load advise
Edit file
Proposal
Load Data
Statistics
Visualization
Abnormality
Report
Concrete
Steel
Tunel
Country house
Bridge
Water react on resistivity increasing the values and increase risk of corrosion.
&0.0,0.6,0.0,0.4,0.0
option41
option 42
option 43


Data Fusion System
Please analyse the data.The panel provide editable and visual, global and local information for loaded data file
help
Load advise
Edit file
Proposal
Load Data
Statistics
Visualization
Abnormality
Report
Weight
General statistical information for the measurements
Shmit-Hammer
0.2
No information for this device
Covermeter(C)
0.6
All measurements=110 num.points=24 max=63 min=28 mid=46.18181818181818 St.Dev=8.80698411154186
Covermeter(S)
0.2
No information for this device
Half Cell
0.4
All measurements=96 num.points=24 max=450 min=89 mid=252.29166666666666 St.Dev=83.03238641025838
Resistivity
0.2
No information for this device
56, x=3000, y=600 ,51,52,50,
97, x=3000, y=690 ,34,35,36,
, x=300, y=60 ,143,144,139,1
5, x=300, y=450 ,91,95,90,89
, x=300, y=1050 ,387,380,379
8, x=750, y=60 ,190,189,192,
1, x=750, y=450 ,140,141,140
, x=750, y=900 ,446,450,444,
, x=1350, y=60 ,290,289,291,
6, x=1350, y=450 ,219,220,22
5, x=1350, y=840 ,394,395,39
67, x=1950, y=60 ,256,257,26
update
Half Cell
X 1334
Y 1439
go
zones
10
Approx level
1
Method
Clean
Splain
approx 4
Point 4 X=1350 Y=450
MaxVal=55 MinVal=50
Mean=51.6
distance=989.12941519297
Zone 1 (50.0-51.0) =40.0
Zone 2 (51.0-52.0) =20.0
Zone 3 (52.0-53.0) =20.0
Zone 4 (53.0-54.0) =0.0%
Zone 5 (54.0-55.0) =20.0
==========
Approx. value is:NaN


Data Fusion System
Weight mixture information is presented on sensitive panels. Change the graphical scale from previous panel
help
Load advise
Edit file
Proposal
Load Data
Statistics
Visualization
Abnormality
Report
Concreet
Steel
Total
Clicked point
Total graph measurement point X=2774 Y=59
Shmith-hammer: 0.0 % weight: 0.2
Covermether(C): 70.35179859814043 % weight: 0.6
Covermether(S): 0.0 % weight: 0.2
Half_Cell: 29.648201401859577 % weight: 0.4
Resistivity: 0.0 % weight: 0.2

R E P O R T

1).The initial expert file is C:\Program Files\Ziad\data\Example.exp.
From the proposal options the expert result string is: Water reacts on resistivity increasing the values and increase risk of corrosion.
&0.0,0.6,0.0,0.4,0.0.

2) The data file with name C:\Program Files\Ziad\data\testdata.dat was loaded.
The working data are:
Covermeter(C)
1 (5) SD=2.449489742783178, x=300, y=60 ,53,53,55,50,49
2 (5) SD=3.1144823004794873, x=300, y=450 ,58,53,60,54,59
3 (5) SD=2.588435821108957, x=300, y=1050 ,59,60,58,63,56
4 (5) SD=2.7748873851023217, x=750, y=60 ,58,53,59,60,56
5 (0) SD=-0.0, x=750, y=450
6 (5) SD=2.302172886644268, x=750, y=900 ,53,52,49,55,54
7 (5) SD=4.242640687119285, x=1350, y=60 ,45,55,51,49,55
8 (5) SD=2.073644135332772, x=1350, y=450 ,51,55,52,50,50
9 (0) SD=-0.0, x=1350, y=840
10 (5) SD=2.23606797749979, x=1950, y=60 ,36,32,35,38,34
11 (5) SD=2.04939015319192, x=1950, y=30 ,42,40,37,42,40
12 (5) SD=1.4832396974191326, x=1800, y=540 ,53,54,53,55,51
13 (5) SD=1.140175425099138, x=1800, y=810 ,30,32,31,29,30
14 (5) SD=1.5811388300841898, x=2250, y=60 ,41,42,40,43,39
15 (5) SD=3.5355339059327378, x=2250, y=300 ,52,55,46,49,53
16 (5) SD=1.8708286933869707, x=2100, y=540 ,42,42,45,40,41
17 (5) SD=1.9235384061671346, x=2100, y=810 ,32,32,33,31,28
18 (5) SD=0.8366600265340756, x=2520, y=60 ,46,47,45,46,45
19 (5) SD=1.0, x=2520, y=300 ,51,50,52,52,50
20 (5) SD=2.0, x=2400, y=540 ,47,45,49,45,49
21 (5) SD=3.0, x=2400, y=780 ,35,38,32,32,38
22 (5) SD=1.3416407864998738, x=3000, y=60 ,48,46,49,46,48
23 (5) SD=0.8366600265340756, x=3000, y=600 ,51,52,50,51,52
24 (5) SD=1.3038404810405297, x=3000, y=690 ,34,35,36,33,33
Half Cell
1 (4) SD=4.112987559751022, x=300, y=60 ,143,144,139,149
2 (4) SD=2.6299556396765835, x=300, y=450 ,91,95,90,89
3 (4) SD=5.354126134736337, x=300, y=1050 ,387,380,379,390
4 (4) SD=1.8257418583505538, x=750, y=60 ,190,189,192,193
5 (4) SD=1.4142135623730951, x=750, y=450 ,140,141,140,143
6 (4) SD=3.415650255319866, x=750, y=900 ,446,450,444,442
7 (4) SD=0.816496580927726, x=1350, y=60 ,290,289,291,290
8 (4) SD=1.2909944487358056, x=1350, y=450 ,219,220,221,218
9 (4) SD=2.6299556396765835, x=1350, y=840 ,394,395,390,396
10 (4) SD=2.3804761428476167, x=1950, y=60 ,256,257,260,261
11 (4) SD=2.0816659994661326, x=1950, y=30 ,227,228,230,225
12 (4) SD=2.3804761428476167, x=1800, y=540 ,275,275,276,280
13 (4) SD=1.2909944487358056, x=1800, y=810 ,339,340,341,338
14 (4) SD=1.2909944487358056, x=2250, y=60 ,259,260,258,261
15 (4) SD=1.2909944487358056, x=2250, y=300 ,262,260,261,263
16 (4) SD=2.753785273643051, x=2100, y=540 ,292,290,295,296
17 (4) SD=3.8622100754188224, x=2100, y=810 ,316,318,320,325
18 (4) SD=2.6299556396765835, x=2520, y=60 ,256,255,254,250
19 (4) SD=2.6457513110645907, x=2520, y=300 ,202,200,199,205
20 (4) SD=5.439056290693573, x=2400, y=540 ,222,214,225,226
21 (4) SD=1.2909944487358056, x=2400, y=780 ,268,269,270,267
22 (4) SD=1.4142135623730951, x=3000, y=60 ,214,215,214,217
23 (4) SD=2.753785273643051, x=3000, y=600 ,206,204,210,209
24 (4) SD=1.2909944487358056, x=3000, y=690 ,152,151,150,153.

3). the weights for the devices are:
0.2
0.6
0.2
0.4
0.2

4). Global analysis for the data show:
Device 1: No information for this device
Device 2: All measurements=110 num. points=24 max=63 min=28 mid=46.18181818181818 St. Dev=8.80698411154186
Device 3: No information for this device
Device 4: All measurements=96 num. points=24 max=450 min=89 mid=252.29166666666666 St. Dev=83.03238641025838
Device 5: No information for this device

5). provided experiments for particular points:
==========
Covermeter(C) point: X=1334 Y=1439
The 4 closest points are:

Point 1 X=1350 Y=840
MaxVal=-30000 MinVal=30000
Mean=NaN
Distance=599.213651379873
Zone 1 (30000.0-18000.0) =NaN%
Zone 2 (18000.0-6000.0) =NaN%
Zone 3 (6000.0--6000.0) =NaN%
Zone 4 (-6000.0--18000.0) =NaN%
Zone 5 (-18000.0--30000.0) =NaN%

Point 2 X=1800 Y=810
MaxVal=32 MinVal=29
Mean=30.4
Distance=782.8135154684032
Zone 1 (29.0-29.6) =20.0%
Zone 2 (29.6-30.2) =40.0%
Zone 3 (30.2-30.8) =0.0%
Zone 4 (30.8-31.4) =20.0%
Zone 5 (31.4-32.0) =20.0%

Point 3 X=750 Y=900
MaxVal=55 MinVal=49
Mean=52.6
Distance=794.7181890456516
Zone 1 (49.0-50.2) =20.0%
Zone 2 (50.2-51.4) =0.0%
Zone 3 (51.4-52.6) =20.0%
Zone 4 (52.6-53.8) =20.0%
Zone 5 (53.8-55.0) =40.0%

Point 4 X=1350 Y=450
MaxVal=55 MinVal=50
Mean=51.6
Distance=989.1294151929767
Zone 1 (50.0-51.0) =40.0%
Zone 2 (51.0-52.0) =20.0%
Zone 3 (52.0-53.0) =20.0%
Zone 4 (53.0-54.0) =0.0%
Zone 5 (54.0-55.0) =20.0%

```
==========
 Approx. value is: Nan

 6). provided visualization point's checking analyse:

 Concrete graph measurement point X=2115 Y=749
 Schmidt-hammer data:  0.0 % weight: 0.2
     Covermeter(C):  100.00000000000001 % weight: 0.6

 Steel graph measurement point X=614 Y=1364
 Covermeter(S):  0.0 % weight: 0.2
      Half-Cell:  100.00000000000001 % weight: 0.4
    Resistivity:  0.0 % weight: 0.2

 Steel graph measurement point X=2280 Y=1469
 Covermeter(S):  0.0 % weight: 0.2
      Half-Cell:  100.0 % weight: 0.4
    Resistivity:  0.0 % weight: 0.2

 Total graph measurement point X=2070 Y=704
  Schmidt-Hammer:  0.0 % weight: 0.2
 Covermeter(C):  58.498846761485744 % weight: 0.6
 Covermeter(S):  0.0 % weight: 0.2
      Half-Cell:  41.501153238514256 % weight: 0.4
    Resistivity:  0.0 % weight: 0.2

 Total graph measurement point X=2774 Y=59
  Schmidt-Hammer:  0.0 % weight: 0.2
 Covermeter(C):  70.35179859814043 % weight: 0.6
 Covermeter(S):  0.0 % weight: 0.2
      Half-Cell:  29.648201401859577 % weight: 0.4
    Resistivity:  0.0 % weight: 0.2

 7). Abnormality experiments:

-------- STANDART DEVIATION---------
SD in device: 1 = 8.80698411154186
SD in device: 3 = 83.03238641025838
------------------------
Big standard dev in device:3 = 83.03238641025838

 -------MAX/MIN-------
 Device 1
1 Max = 55 Min = 49
2 Max = 60 Min = 53
3 Max = 63 Min = 56
4 Max = 60 Min = 53
5 Max = -34565 Min = 34500
6 Max = 55 Min = 49
7 Max = 55 Min = 45
8 Max = 55 Min = 50
9 Max = -34565 Min = 34500
10 Max = 38 Min = 32
11 Max = 42 Min = 37
12 Max = 55 Min = 51
13 Max = 32 Min = 29
14 Max = 43 Min = 39
15 Max = 55 Min = 46
16 Max = 45 Min = 40
17 Max = 33 Min = 28
```

```
18 Max = 47 Min = 45
19 Max = 52 Min = 50
20 Max = 49 Min = 45
21 Max = 38 Min = 32
22 Max = 49 Min = 46
23 Max = 52 Min = 50
24 Max = 36 Min = 33
 ------------------
 Device 3
1 Max = 149 Min = 139
2 Max = 95 Min = 89
3 Max = 390 Min = 379
4 Max = 193 Min = 189
5 Max = 143 Min = 140
6 Max = 450 Min = 442
7 Max = 291 Min = 289
8 Max = 221 Min = 218
9 Max = 396 Min = 390
10 Max = 261 Min = 256
11 Max = 230 Min = 225
12 Max = 280 Min = 275
13 Max = 341 Min = 338
14 Max = 261 Min = 258
15 Max = 263 Min = 260
16 Max = 296 Min = 290
17 Max = 325 Min = 316
18 Max = 256 Min = 250
19 Max = 205 Min = 199
20 Max = 226 Min = 214
21 Max = 270 Min = 267
22 Max = 217 Min = 214
23 Max = 210 Min = 204
24 Max = 153 Min = 150
 ------------------
 ----WEIGHT----
 Device weight
 0      0.2
 1      0.6
 2      0.2
 3      0.4
 4      0.2
 Irrelevant data < > +-(1.0 * SD)+mean
 Device 1
1 x= 300 y= 300 (55) mid=52.0 SD=2.449489742783178 dev. from mean:3.0
1 x= 300 y= 300 (49) mid=52.0 SD=2.449489742783178 dev. from mean:3.0
2 x= 300 y= 300 (53) mid=56.8 SD=3.1144823004794873 dev. from
mean:3.799999999999997
2 x= 300 y= 300 (60) mid=56.8 SD=3.1144823004794873 dev. from
mean:3.200000000000003
3 x= 300 y= 300 (63) mid=59.2 SD=2.588435821108957 dev. from
mean:3.799999999999997
3 x= 300 y= 300 (56) mid=59.2 SD=2.588435821108957 dev. from
mean:3.200000000000003
4 x= 750 y= 750 (53) mid=57.2 SD=2.7748873851023217 dev. from
mean:4.200000000000003
4 x= 750 y= 750 (60) mid=57.2 SD=2.7748873851023217 dev. from
mean:2.799999999999997
6 x= 750 y= 750 (49) mid=52.6 SD=2.302172886644268 dev. from
mean:3.6000000000000014
6 x= 750 y= 750 (55) mid=52.6 SD=2.302172886644268 dev. from
mean:2.3999999999999986
```

7 x= 1350 y= 1350 (45) mid=51.0 SD=4.242640687119285 dev. from mean:6.0
8 x= 1350 y= 1350 (55) mid=51.6 SD=2.073644135332772 dev. from mean:3.3999999999999986
10 x= 1950 y= 1950 (32) mid=35.0 SD=2.23606797749979 dev. from mean:3.0
10 x= 1950 y= 1950 (38) mid=35.0 SD=2.23606797749979 dev. from mean:3.0
11 x= 1950 y= 1950 (37) mid=40.2 SD=2.04939015319192 dev. from mean:3.200000000000003
12 x= 1800 y= 1800 (55) mid=53.2 SD=1.4832396974191326 dev. from mean:1.7999999999999972
12 x= 1800 y= 1800 (51) mid=53.2 SD=1.4832396974191326 dev. from mean:2.200000000000003
13 x= 1800 y= 1800 (32) mid=30.4 SD=1.140175425099138 dev. from mean:1.6000000000000014
13 x= 1800 y= 1800 (29) mid=30.4 SD=1.140175425099138 dev. from mean:1.3999999999999986
14 x= 2250 y= 2250 (43) mid=41.0 SD=1.5811388300841898 dev. from mean:2.0
14 x= 2250 y= 2250 (39) mid=41.0 SD=1.5811388300841898 dev. from mean:2.0
15 x= 2250 y= 2250 (55) mid=51.0 SD=3.5355339059327378 dev. from mean:4.0
15 x= 2250 y= 2250 (46) mid=51.0 SD=3.5355339059327378 dev. from mean:5.0
16 x= 2100 y= 2100 (45) mid=42.0 SD=1.8708286933869707 dev. from mean:3.0
16 x= 2100 y= 2100 (40) mid=42.0 SD=1.8708286933869707 dev. from mean:2.0
17 x= 2100 y= 2100 (28) mid=31.2 SD=1.9235384061671346 dev. from mean:3.1999999999999993
18 x= 2520 y= 2520 (47) mid=45.8 SD=0.8366600265340756 dev. from mean:1.2000000000000028
22 x= 3000 y= 3000 (46) mid=47.4 SD=1.3416407864998738 dev. from mean:1.3999999999999986
22 x= 3000 y= 3000 (49) mid=47.4 SD=1.3416407864998738 dev. from mean:1.6000000000000014
22 x= 3000 y= 3000 (46) mid=47.4 SD=1.3416407864998738 dev. from mean:1.3999999999999986
23 x= 3000 y= 3000 (50) mid=51.2 SD=0.8366600265340756 dev. from mean:1.2000000000000028
24 x= 3000 y= 3000 (36) mid=34.2 SD=1.3038404810405297 dev. from mean:1.7999999999999972
Device 3
1 x= 300 y= 300 (139) mid=143.75 SD=4.112987559751022 dev. from mean:4.75
1 x= 300 y= 300 (149) mid=143.75 SD=4.112987559751022 dev. from mean:5.25
2 x= 300 y= 300 (95) mid=91.25 SD=2.6299556396765835 dev. from mean:3.75
3 x= 300 y= 300 (390) mid=384.0 SD=5.354126134736337 dev. from mean:6.0
4 x= 750 y= 750 (189) mid=191.0 SD=1.8257418583505538 dev. from mean:2.0
4 x= 750 y= 750 (193) mid=191.0 SD=1.8257418583505538 dev. from mean:2.0
5 x= 750 y= 750 (143) mid=141.0 SD=1.4142135623730951 dev. from mean:2.0
6 x= 750 y= 750 (450) mid=445.5 SD=3.415650255319866 dev. from mean:4.5

```
6 x= 750 y= 750 (442) mid=445.5 SD=3.415650255319866 dev. from
mean:3.5
7 x= 1350 y= 1350 (289) mid=290.0 SD=0.816496580927726 dev. from
mean:1.0
7 x= 1350 y= 1350 (291) mid=290.0 SD=0.816496580927726 dev. from
mean:1.0
8 x= 1350 y= 1350 (221) mid=219.5 SD=1.2909944487358056 dev. from
mean:1.5
8 x= 1350 y= 1350 (218) mid=219.5 SD=1.2909944487358056 dev. from
mean:1.5
9 x= 1350 y= 1350 (390) mid=393.75 SD=2.6299556396765835 dev. from
mean:3.75
10 x= 1950 y= 1950 (256) mid=258.5 SD=2.3804761428476167 dev. from
mean:2.5
10 x= 1950 y= 1950 (261) mid=258.5 SD=2.3804761428476167 dev. from
mean:2.5
11 x= 1950 y= 1950 (230) mid=227.5 SD=2.0816659994661326 dev. from
mean:2.5
11 x= 1950 y= 1950 (225) mid=227.5 SD=2.0816659994661326 dev. from
mean:2.5
12 x= 1800 y= 1800 (280) mid=276.5 SD=2.3804761428476167 dev. from
mean:3.5
13 x= 1800 y= 1800 (341) mid=339.5 SD=1.2909944487358056 dev. from
mean:1.5
13 x= 1800 y= 1800 (338) mid=339.5 SD=1.2909944487358056 dev. from
mean:1.5
14 x= 2250 y= 2250 (258) mid=259.5 SD=1.2909944487358056 dev. from
mean:1.5
14 x= 2250 y= 2250 (261) mid=259.5 SD=1.2909944487358056 dev. from
mean:1.5
15 x= 2250 y= 2250 (260) mid=261.5 SD=1.2909944487358056 dev. from
mean:1.5
15 x= 2250 y= 2250 (263) mid=261.5 SD=1.2909944487358056 dev. from
mean:1.5
16 x= 2100 y= 2100 (290) mid=293.25 SD=2.753785273643051 dev. from
mean:3.25
17 x= 2100 y= 2100 (325) mid=319.75 SD=3.8622100754188224 dev. from
mean:5.25
18 x= 2520 y= 2520 (250) mid=253.75 SD=2.6299556396765835 dev. from
mean:3.75
19 x= 2520 y= 2520 (205) mid=201.5 SD=2.6457513110645907 dev. from
mean:3.5
20 x= 2400 y= 2400 (214) mid=221.75 SD=5.439056290693573 dev. from
mean:7.75
21 x= 2400 y= 2400 (270) mid=268.5 SD=1.2909944487358056 dev. from
mean:1.5
21 x= 2400 y= 2400 (267) mid=268.5 SD=1.2909944487358056 dev. from
mean:1.5
22 x= 3000 y= 3000 (217) mid=215.0 SD=1.4142135623730951 dev. from
mean:2.0
23 x= 3000 y= 3000 (204) mid=207.25 SD=2.753785273643051 dev. from
mean:3.25
24 x= 3000 y= 3000 (150) mid=151.5 SD=1.2909944487358056 dev. from
mean:1.5
24 x= 3000 y= 3000 (153) mid=151.5 SD=1.2909944487358056 dev. from
mean:1.5
 Graphics mix information
 Concrete
max in x=89.99999 y=749.99994,
min in x=1844.9999 y=809.99994,
 Steel
```

```
max in x=749.99994 y=899.99994,
min in x=299.99997 y=449.99997,
 Total
max in x=14.999999 y=749.99994,
min in x=2999.9998 y=689.99994,
```

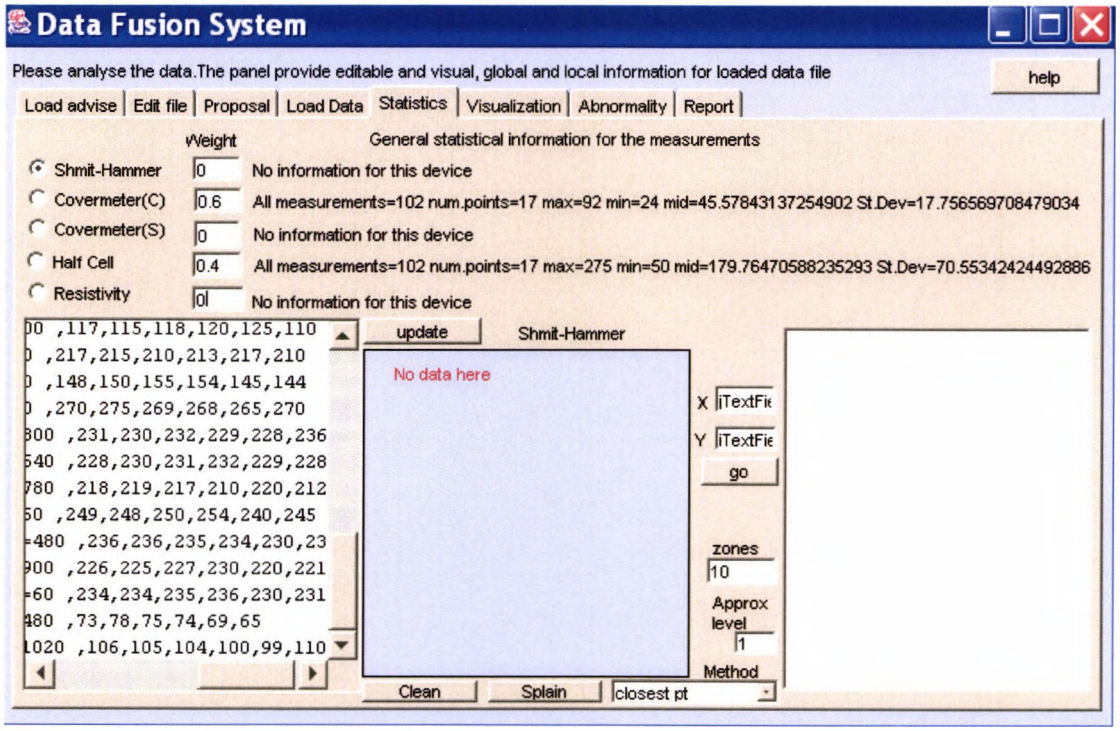
South 1

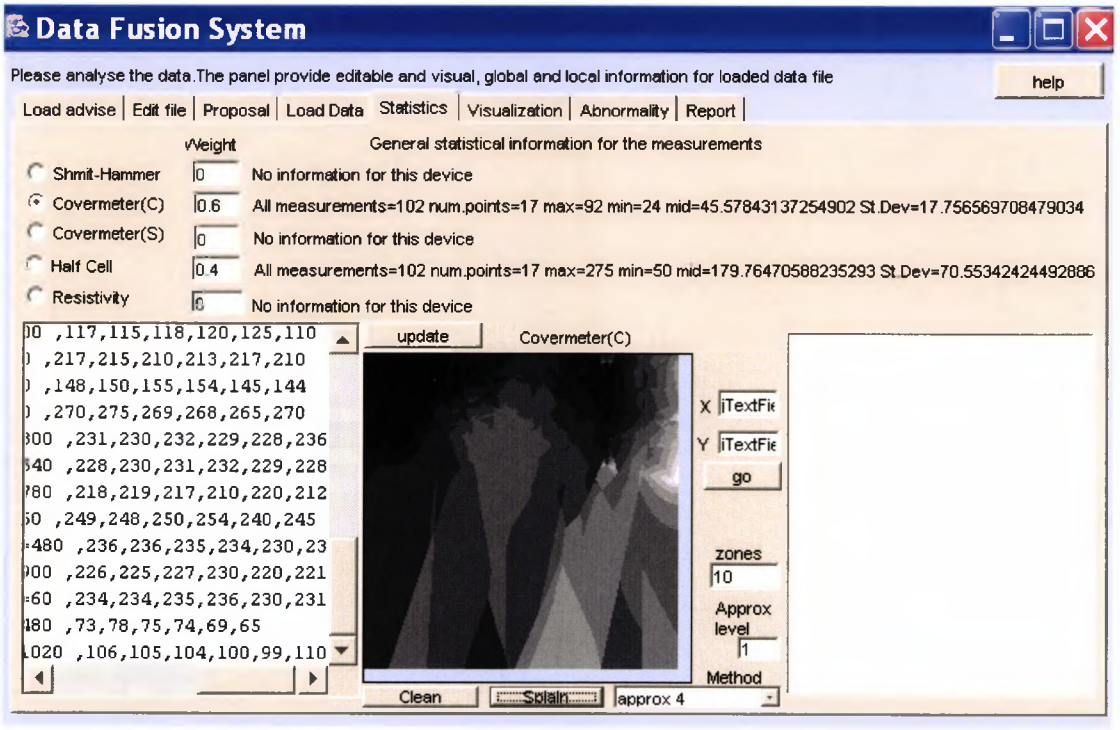
Covermeter

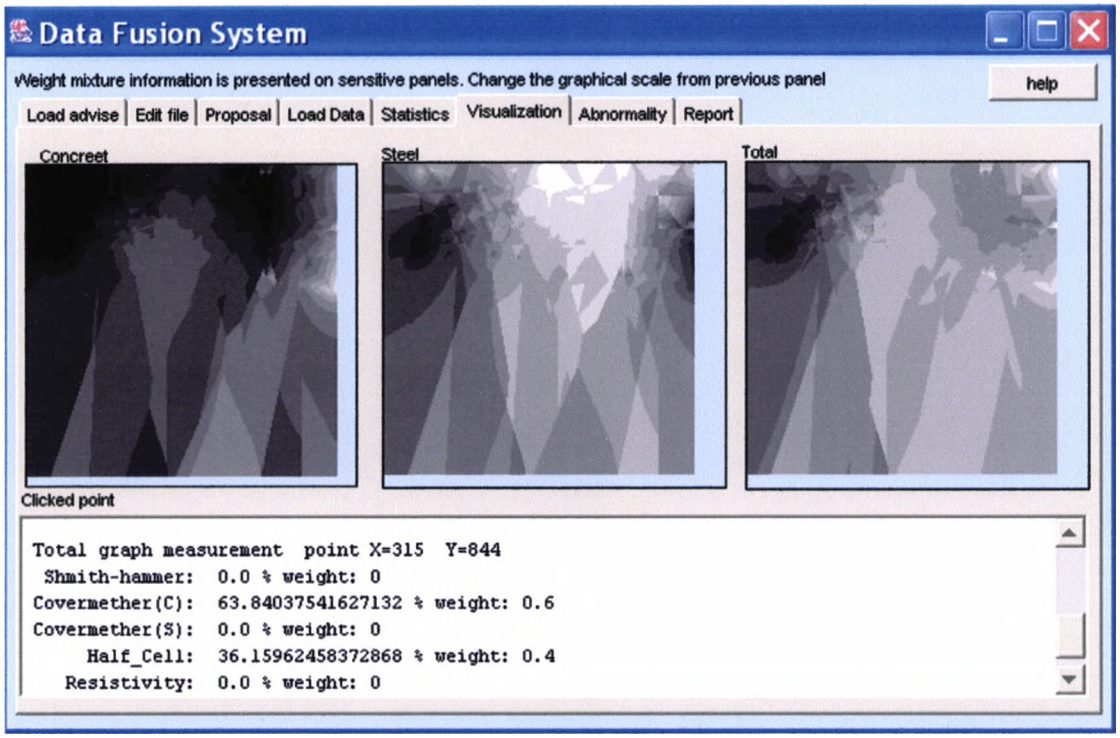
Point	X	Y	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6
1	300	60	32	33	30	36	35	29
2	300	420	28	29	30	27	26	28
3	300	720	27	28	25	29	30	27
4	750	60	32	30	32	31	34	29
5	750	300	30	29	28	27	31	32
6	900	540	56	57	58	55	59	57
7	900	750	58	59	55	60	59	57
8	1320	60	38	40	38	38	39	37
9	1320	300	48	50	49	47	48	46
10	1380	540	49	48	47	50	49	48
11	1380	780	57	58	54	60	59	57
12	1950	60	25	26	24	25	25	**26**
13	1950	480	29	29	30	29	28	**31**
14	1950	900	43	40	42	44	45	**41**
15	2520	60	71	70	70	69	69	71
16	2520	480	63	60	62	65	60	59
17	2520	1020	92	90	91	90	89	88

Half Cell

Point	X	Y	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6
1	300	60	222	221	220	219	225	218
2	300	420	55	56	58	50	54	56
3	300	720	53	55	56	50	54	51
4	750	60	184	185	180	190	179	182
5	750	300	117	115	118	120	125	110
6	900	540	217	215	210	213	217	210
7	900	750	148	150	155	154	145	144
8	1320	60	270	275	269	268	265	270
9	1320	300	231	230	232	229	228	236
10	1380	540	228	230	231	232	229	228
11	1380	780	218	219	217	210	220	212
12	1950	60	249	248	250	254	240	**245**
13	1950	480	236	236	235	234	230	**239**
14	1950	900	226	225	227	230	220	**221**
15	2520	60	234	234	235	236	230	231
16	2520	480	73	78	75	74	69	65
17	2520	1020	106	105	104	100	99	110


Data Fusion System
Please analyse the data.The panel provide editable and visual, global and local information for loaded data file
help
Load advise
Edit file
Proposal
Load Data
Statistics
Visualization
Abnormality
Report
Weight
General statistical information for the measurements
Shmit-Hammer
No information for this device
Covermeter(C)
All measurements=102 num.points=17 max=92 min=24 mid=45.57843137254902 St.Dev=17.756569708479034
Covermeter(S)
No information for this device
Half Cell
All measurements=102 num.points=17 max=275 min=50 mid=179.76470588235293 St.Dev=70.55342424492886
Resistivity
No information for this device
update
Shmit-Hammer
No data here
X
Y
go
zones
Approx level
Method
Clean
Splain
closest pt


Data Fusion System
Please analyse the data.The panel provide editable and visual, global and local information for loaded data file
help
Load advise
Edit file
Proposal
Load Data
Statistics
Visualization
Abnormality
Report
Weight
General statistical information for the measurements
Shmit-Hammer
No information for this device
Covermeter(C)
All measurements=102 num.points=17 max=92 min=24 mid=45.57843137254902 St.Dev=17.756569708479034
Covermeter(S)
No information for this device
Half Cell
All measurements=102 num.points=17 max=275 min=50 mid=179.76470588235293 St.Dev=70.55342424492886
Resistivity
No information for this device
update
Covermeter(C)
X
Y
go
zones
Approx level
Method
Clean
Splain
approx 4


Data Fusion System
Weight mixture information is presented on sensitive panels. Change the graphical scale from previous panel
help
Load advise
Edit file
Proposal
Load Data
Statistics
Visualization
Abnormality
Report
Concreet
Steel
Total
Clicked point
Total graph measurement point X=315 Y=844
Shmith-hammer: 0.0 % weight: 0
Covermether(C): 63.84037541627132 % weight: 0.6
Covermether(S): 0.0 % weight: 0
Half_Cell: 36.15962458372868 % weight: 0.4
Resistivity: 0.0 % weight: 0

R E P O R T

1) The initial expert file is C:\Program Files\Ziad\data\Example.exp.
From the proposal options the expert result string is: Water react on resistivity increasing the values and increase risk of corrosion.
&0.0,0.6,0.0,0.4,0.0.

2) The data file with name C:\Program Files\Ziad\data\testdata.dat was loaded.
The working data are:
Covermeter(C)
1 (6) SD=2.7386127875258306, x=300, y=60 ,32,33,30,36,35,29
2 (6) SD=1.4142135623730951, x=300, y=420 ,28,29,30,27,26,28
3 (6) SD=1.7511900715418263, x=300, y=720 ,27,28,25,29,30,27
4 (6) SD=1.7511900715418263, x=750, y=60 ,32,30,32,31,34,29
5 (6) SD=1.8708286933869707, x=750, y=300 ,30,29,28,27,31,32
6 (6) SD=1.4142135623730951, x=900, y=540 ,56,57,58,55,59,57
7 (6) SD=1.7888543819998317, x=900, y=750 ,58,59,55,60,59,57
8 (6) SD=1.0327955589886444, x=1320, y=60 ,38,40,38,38,39,37
9 (6) SD=1.4142135623730951, x=1320, y=300 ,48,50,49,47,48,46
10 (6) SD=1.0488088481701516, x=1380, y=540 ,49,48,47,50,49,48
11 (6) SD=2.073644135332772, x=1380, y=780 ,57,58,54,60,59,57
12 (6) SD=0.752772652709081, x=1950, y=60 ,25,26,24,25,25,26
13 (6) SD=1.0327955589886446, x=1950, y=480 ,29,29,30,29,28,31
14 (6) SD=1.8708286933869707, x=1950, y=900 ,43,40,42,44,45,41
15 (6) SD=0.8944271909999159, x=2520, y=60 ,71,70,70,69,69,71
16 (6) SD=2.258317958127243, x=2520, y=480 ,63,60,62,65,60,59
17 (6) SD=1.4142135623730951, x=2520, y=1020 ,92,90,91,90,89,88
Half Cell
1 (6) SD=2.48327740429189, x=300, y=60 ,222,221,220,219,225,218
2 (6) SD=2.714160398109638, x=300, y=420 ,55,56,58,50,54,56
3 (6) SD=2.316606713852541, x=300, y=720 ,53,55,56,50,54,51
4 (6) SD=3.983298465677241, x=750, y=60 ,184,185,180,190,179,182
5 (6) SD=5.0099900199501395, x=750, y=300 ,117,115,118,120,125,110
6 (6) SD=3.204163957519444, x=900, y=540 ,217,215,210,213,217,210
7 (6) SD=4.546060565661952, x=900, y=750 ,148,150,155,154,145,144
8 (6) SD=3.271085446759225, x=1320, y=60 ,270,275,269,268,265,270
9 (6) SD=2.8284271247461903, x=1320, y=300 ,231,230,232,229,228,236
10 (6) SD=1.632993161855452, x=1380, y=540 ,228,230,231,232,229,228
11 (6) SD=4.049691346263317, x=1380, y=780 ,218,219,217,210,220,212
12 (6) SD=4.760952285695233, x=1950, y=60 ,249,248,250,254,240,245
13 (6) SD=2.9664793948382653, x=1950, y=480 ,236,236,235,234,230,239
14 (6) SD=3.763863263545405, x=1950, y=900 ,226,225,227,230,220,221
15 (6) SD=2.3380903889000244, x=2520, y=60 ,234,234,235,236,230,231
16 (6) SD=4.633213427705081, x=2520, y=480 ,73,78,75,74,69,65
17 (6) SD=4.049691346263317, x=2520, y=1020 ,106,105,104,100,99,110.

3) The weights for the devices are:
0
0.6
0
0.4
0

4). Global analysis for the data show:
Device 1: No information for this device
Device 2: All measurements=102 num. points=17 max=92 min=24 mid=45.57843137254902 St. Dev=17.756569708479034
Device 3: No information for this device
Device 4: All measurements=102 num. points=17 max=275 min=50 mid=179.76470588235293 St. Dev=70.55342424492886

Device 5: No information for this device

5) Provided experiments for particular points:

6) Provided visualization point's checking analyse:

Concrete graph measurement point X=1260 Y=944
Schmidt-Hammer data: 0.0 % weight: 0
    Covermeter(C): 100.0 % weight: 0.6

Steel graph measurement point X=516 Y=844
Covermeter(S): 0.0 % weight: 0
     Half-Cell: 100.0 % weight: 0.4
   Resistivity: 0.0 % weight: 0

Total graph measurement point X=315 Y=844
 Schmidt-Hammer: 0.0 % weight: 0
Covermeter(C): 63.84037541627132 % weight: 0.6
Covermeter(S): 0.0 % weight: 0
     Half-Cell: 36.15962458372868 % weight: 0.4
   Resistivity: 0.0 % weight: 0

7). Abnormality experiments:

-------- STANDART DEVIATION--------
SD in device: 1 = 17.756569708479034
SD in device: 3 = 70.55342424492886

Big standard dev in device:3 = 70.55342424492886

-------MAX/MIN-------
Device 1
1 Max = 36 Min = 29
2 Max = 30 Min = 26
3 Max = 30 Min = 25
4 Max = 34 Min = 29
5 Max = 32 Min = 27
6 Max = 59 Min = 55
7 Max = 60 Min = 55
8 Max = 40 Min = 37
9 Max = 50 Min = 46
10 Max = 50 Min = 47
11 Max = 60 Min = 54
12 Max = 26 Min = 24
13 Max = 31 Min = 28
14 Max = 45 Min = 40
15 Max = 71 Min = 69
16 Max = 65 Min = 59
17 Max = 92 Min = 88

Device 3
1 Max = 225 Min = 218
2 Max = 58 Min = 50
3 Max = 56 Min = 50
4 Max = 190 Min = 179
5 Max = 125 Min = 110
6 Max = 217 Min = 210
7 Max = 155 Min = 144
8 Max = 275 Min = 265
9 Max = 236 Min = 228

```
10 Max = 232 Min = 228
11 Max = 220 Min = 210
12 Max = 254 Min = 240
13 Max = 239 Min = 230
14 Max = 230 Min = 220
15 Max = 236 Min = 230
16 Max = 78 Min = 65
17 Max = 110 Min = 99
 ------------------
 ----WEIGHT----
 Device weight
 0      0
 1      0.6
 2      0
 3      0.4
 4      0
 Irrelevant data < > +-(1.0 * SD)+mean
 Device 1
1  x=  300  y=  300  (36)  mid=32.5  SD=2.7386127875258306  dev.  from
mean:3.5
1  x=  300  y=  300  (29)  mid=32.5  SD=2.7386127875258306  dev.  from
mean:3.5
2  x=  300  y=  300  (30)  mid=28.0  SD=1.4142135623730951  dev.  from
mean:2.0
2  x=  300  y=  300  (26)  mid=28.0  SD=1.4142135623730951  dev.  from
mean:2.0
3 x= 300 y= 300 (25) mid=27.666666666666668 SD=1.7511900715418263 dev.
from mean:2.666666666666668
3 x= 300 y= 300 (30) mid=27.666666666666668 SD=1.7511900715418263 dev.
from mean:2.333333333333332
4 x= 750 y= 750 (34) mid=31.333333333333332 SD=1.7511900715418263 dev.
from mean:2.666666666666668
4 x= 750 y= 750 (29) mid=31.333333333333332 SD=1.7511900715418263 dev.
from mean:2.333333333333332
5  x=  750  y=  750  (27)  mid=29.5  SD=1.8708286933869707  dev.  from
mean:2.5
5  x=  750  y=  750  (32)  mid=29.5  SD=1.8708286933869707  dev.  from
mean:2.5
6  x=  900  y=  900  (55)  mid=57.0  SD=1.4142135623730951  dev.  from
mean:2.0
6  x=  900  y=  900  (59)  mid=57.0  SD=1.4142135623730951  dev.  from
mean:2.0
7  x=  900  y=  900  (55)  mid=58.0  SD=1.7888543819998317  dev.  from
mean:3.0
7  x=  900  y=  900  (60)  mid=58.0  SD=1.7888543819998317  dev.  from
mean:2.0
8 x= 1320 y= 1320 (40) mid=38.333333333333336 SD=1.0327955589886444
dev. from mean:1.6666666666666643
8 x= 1320 y= 1320 (37) mid=38.333333333333336 SD=1.0327955589886444
dev. from mean:1.3333333333333357
9  x=  1320  y=  1320  (50)  mid=48.0  SD=1.4142135623730951  dev.  from
mean:2.0
9  x=  1320  y=  1320  (46)  mid=48.0  SD=1.4142135623730951  dev.  from
mean:2.0
10  x=  1380  y=  1380  (47)  mid=48.5  SD=1.0488088481701516  dev.  from
mean:1.5
10  x=  1380  y=  1380  (50)  mid=48.5  SD=1.0488088481701516  dev.  from
mean:1.5
11  x=  1380  y=  1380  (54)  mid=57.5  SD=2.073644135332772  dev.  from
mean:3.5
```

11 x= 1380 y= 1380 (60) mid=57.5 SD=2.073644135332772 dev. from mean:2.5
12 x= 1950 y= 1950 (26) mid=25.166666666666668 SD=0.752772652709081 dev. from mean:0.8333333333333321
12 x= 1950 y= 1950 (24) mid=25.166666666666668 SD=0.752772652709081 dev. from mean:1.1666666666666679
12 x= 1950 y= 1950 (26) mid=25.166666666666668 SD=0.752772652709081 dev. from mean:0.8333333333333321
13 x= 1950 y= 1950 (28) mid=29.333333333333332 SD=1.0327955589886446 dev. from mean:1.3333333333333321
13 x= 1950 y= 1950 (31) mid=29.333333333333332 SD=1.0327955589886446 dev. from mean:1.6666666666666679
14 x= 1950 y= 1950 (40) mid=42.5 SD=1.8708286933869707 dev. from mean:2.5
14 x= 1950 y= 1950 (45) mid=42.5 SD=1.8708286933869707 dev. from mean:2.5
15 x= 2520 y= 2520 (71) mid=70.0 SD=0.8944271909999159 dev. from mean:1.0
15 x= 2520 y= 2520 (69) mid=70.0 SD=0.8944271909999159 dev. from mean:1.0
15 x= 2520 y= 2520 (69) mid=70.0 SD=0.8944271909999159 dev. from mean:1.0
15 x= 2520 y= 2520 (71) mid=70.0 SD=0.8944271909999159 dev. from mean:1.0
16 x= 2520 y= 2520 (65) mid=61.5 SD=2.258317958127243 dev. from mean:3.5
16 x= 2520 y= 2520 (59) mid=61.5 SD=2.258317958127243 dev. from mean:2.5
17 x= 2520 y= 2520 (92) mid=90.0 SD=1.4142135623730951 dev. from mean:2.0
17 x= 2520 y= 2520 (88) mid=90.0 SD=1.4142135623730951 dev. from mean:2.0
Device 3
1 x= 300 y= 300 (225) mid=220.83333333333334 SD=2.48327740429189 dev. from mean:4.166666666666657
1 x= 300 y= 300 (218) mid=220.83333333333334 SD=2.48327740429189 dev. from mean:2.833333333333343
2 x= 300 y= 300 (58) mid=54.833333333333336 SD=2.714160398109638 dev. from mean:3.1666666666666643
2 x= 300 y= 300 (50) mid=54.833333333333336 SD=2.714160398109638 dev. from mean:4.833333333333336
3 x= 300 y= 300 (56) mid=53.166666666666664 SD=2.316606713852541 dev. from mean:2.8333333333333357
3 x= 300 y= 300 (50) mid=53.166666666666664 SD=2.316606713852541 dev. from mean:3.1666666666666643
4 x= 750 y= 750 (190) mid=183.33333333333334 SD=3.983298465677241 dev. from mean:6.666666666666657
4 x= 750 y= 750 (179) mid=183.33333333333334 SD=3.983298465677241 dev. from mean:4.333333333333343
5 x= 750 y= 750 (125) mid=117.5 SD=5.0099900199501395 dev. from mean:7.5
5 x= 750 y= 750 (110) mid=117.5 SD=5.0099900199501395 dev. from mean:7.5
6 x= 900 y= 900 (217) mid=213.66666666666666 SD=3.204163957519444 dev. from mean:3.333333333333343
6 x= 900 y= 900 (210) mid=213.66666666666666 SD=3.204163957519444 dev. from mean:3.666666666666657
6 x= 900 y= 900 (217) mid=213.66666666666666 SD=3.204163957519444 dev. from mean:3.333333333333343
6 x= 900 y= 900 (210) mid=213.66666666666666 SD=3.204163957519444 dev. from mean:3.666666666666657

```
7 x= 900 y= 900 (155) mid=149.33333333333334 SD=4.546060565661952 dev.
from mean:5.666666666666657
7 x= 900 y= 900 (154) mid=149.33333333333334 SD=4.546060565661952 dev.
from mean:4.666666666666657
7 x= 900 y= 900 (144) mid=149.33333333333334 SD=4.546060565661952 dev.
from mean:5.333333333333343
8 x= 1320 y= 1320 (275) mid=269.5 SD=3.271085446759225 dev. from
mean:5.5
8 x= 1320 y= 1320 (265) mid=269.5 SD=3.271085446759225 dev. from
mean:4.5
9 x= 1320 y= 1320 (228) mid=231.0 SD=2.8284271247461903 dev. from
mean:3.0
9 x= 1320 y= 1320 (236) mid=231.0 SD=2.8284271247461903 dev. from
mean:5.0
10 x= 1380 y= 1380 (228) mid=229.66666666666666 SD=1.632993161855452
dev. from mean:1.6666666666666572
10 x= 1380 y= 1380 (232) mid=229.66666666666666 SD=1.632993161855452
dev. from mean:2.333333333333343
10 x= 1380 y= 1380 (228) mid=229.66666666666666 SD=1.632993161855452
dev. from mean:1.6666666666666572
11 x= 1380 y= 1380 (210) mid=216.0 SD=4.049691346263317 dev. from
mean:6.0
12 x= 1950 y= 1950 (254) mid=247.66666666666666 SD=4.760952285695233
dev. from mean:6.333333333333343
12 x= 1950 y= 1950 (240) mid=247.66666666666666 SD=4.760952285695233
dev. from mean:7.666666666666657
13 x= 1950 y= 1950 (230) mid=235.0 SD=2.9664793948382653 dev. from
mean:5.0
13 x= 1950 y= 1950 (239) mid=235.0 SD=2.9664793948382653 dev. from
mean:4.0
14 x= 1950 y= 1950 (230) mid=224.83333333333334 SD=3.763863263545405
dev. from mean:5.166666666666657
14 x= 1950 y= 1950 (220) mid=224.83333333333334 SD=3.763863263545405
dev. from mean:4.833333333333343
14 x= 1950 y= 1950 (221) mid=224.83333333333334 SD=3.763863263545405
dev. from mean:3.833333333333343
15 x= 2520 y= 2520 (236) mid=233.33333333333334 SD=2.3380903889000244
dev. from mean:2.666666666666657
15 x= 2520 y= 2520 (230) mid=233.33333333333334 SD=2.3380903889000244
dev. from mean:3.333333333333343
16 x= 2520 y= 2520 (78) mid=72.33333333333333 SD=4.633213427705081
dev. from mean:5.666666666666671
16 x= 2520 y= 2520 (65) mid=72.33333333333333 SD=4.633213427705081
dev. from mean:7.333333333333329
17 x= 2520 y= 2520 (99) mid=104.0 SD=4.049691346263317 dev. from
mean:5.0
17 x= 2520 y= 2520 (110) mid=104.0 SD=4.049691346263317 dev. from
mean:6.0
 Graphics mix information
 Concrete
max in x=2520.0 y=1020.6,
min in x=1940.3999 y=113.399994,
 Steel
max in x=1323.0 y=62.999996,
min in x=302.4 y=693.0,
 Total
max in x=2520.0 y=62.999996,
min in x=302.4 y=693.0,
```

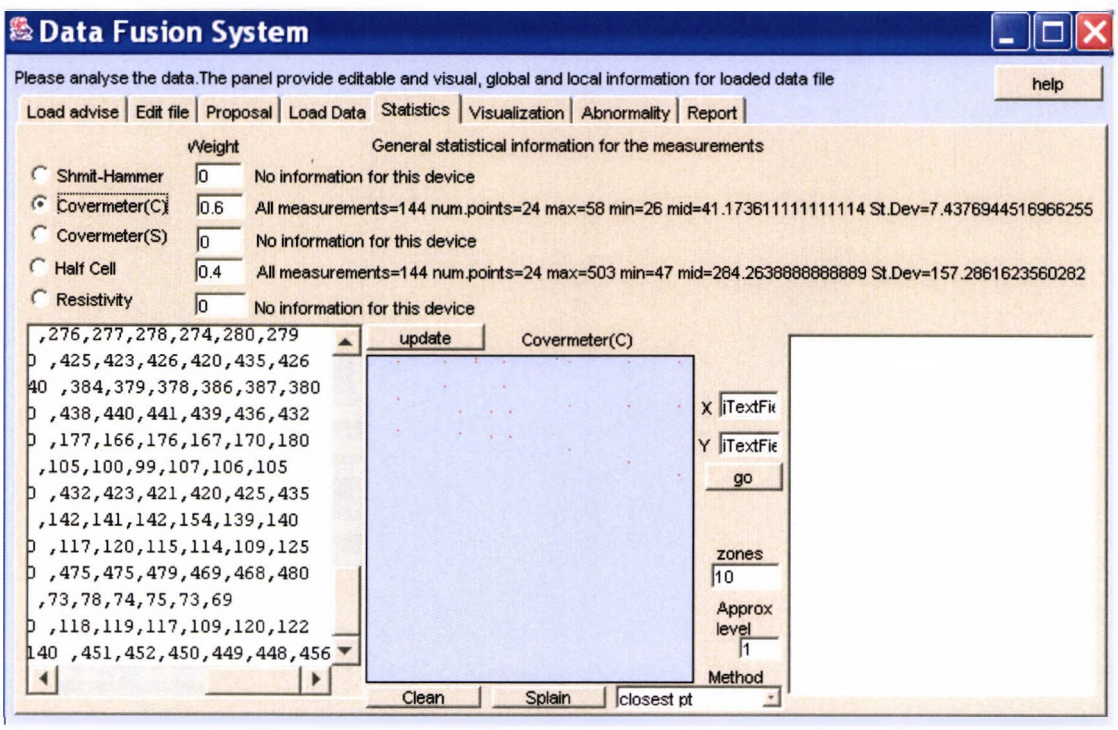
South 2

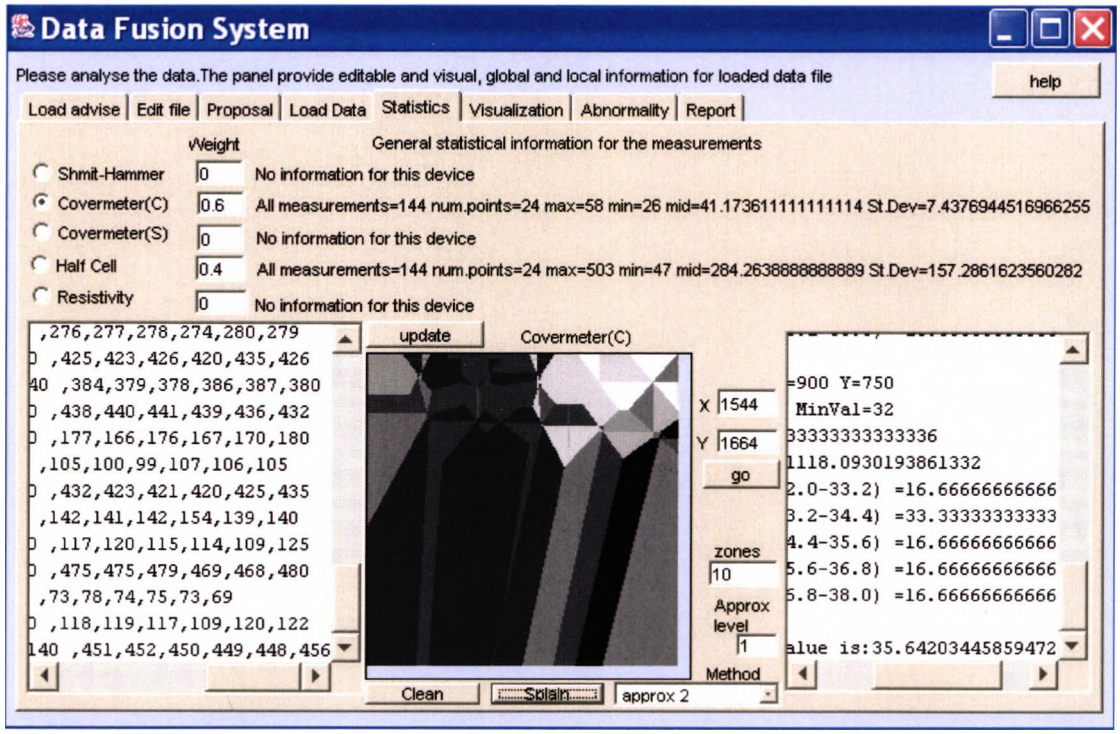
Covermeter

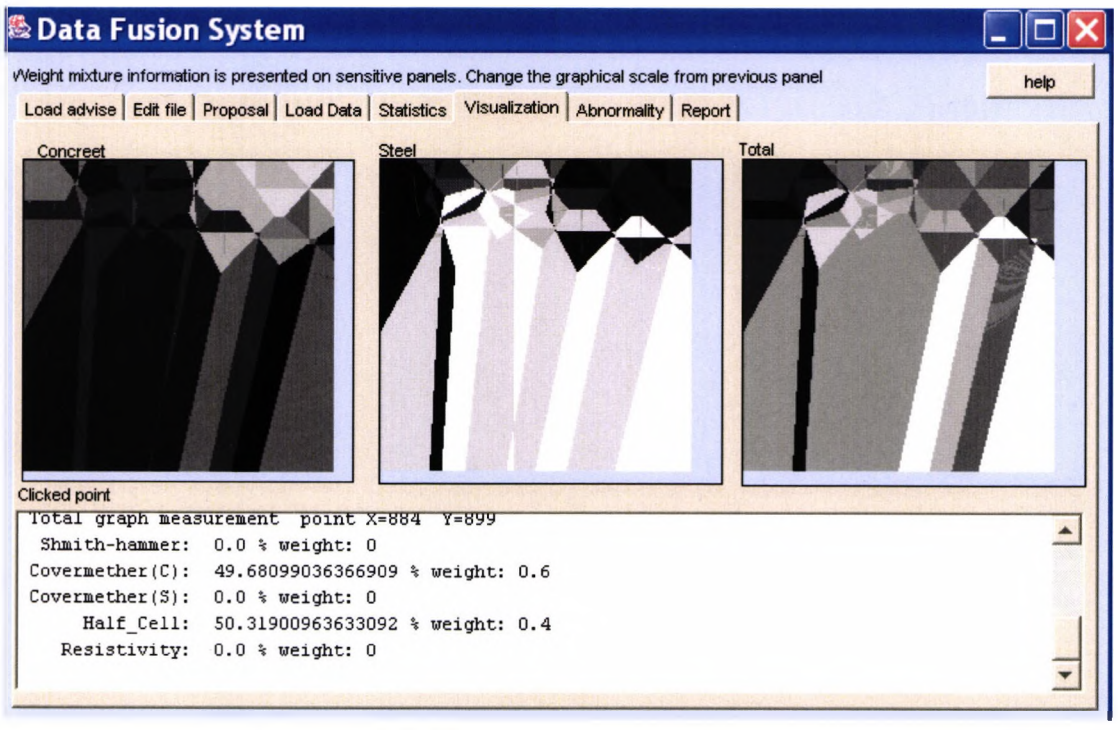
Point	X	Y	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6
1	300	60	45	45	46	49	44	43
2	300	420	45	45	45	45	46	44
3	300	720	38	37	39	35	40	39
4	750	60	36	35	37	38	33	35
5	750	300	38	39	36	35	32	39
6	900	540	40	39	36	38	41	42
7	900	750	34	35	36	34	32	38
8	1050	60	36	38	36	34	35	37
9	1050	30	40	39	40	41	38	37
10	1200	540	39	36	41	40	39	38
11	1200	780	34	35	36	35	33	32
12	1320	60	34	35	36	36	37	33
13	1320	300	38	35	35	40	41	39
14	1380	540	39	39	39	39	40	38
15	1380	780	35	35	36	36	37	33
16	1950	60	53	55	54	49	50	52
17	1950	480	52	49	53	54	56	49
18	1950	900	38	39	37	38	36	38
19	2520	60	58	57	58	56	54	55
20	2520	480	51	52	51	50	49	50
21	2520	1020	44	45	46	43	42	50
22	3000	60	56	57	55	54	50	54
23	3000	480	42	40	41	42	43	44
24	3000	1140	28	27	28	29	26	28

Half Cell

Point	X	Y	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6
1	300	60	104	104	103	102	100	109
2	300	420	98	99	98	97	96	95
3	300	720	69	67	68	69	70	71
4	750	60	246	250	249	47	243	245
5	750	300	165	160	169	165	165	167
6	900	540	490	489	487	495	494	490
7	900	750	415	420	412	413	415	425
8	1050	60	344	342	346	349	339	338
9	1050	30	358	359	360	362	351	352
10	1200	540	498	501	503	497	499	498
11	1200	780	465	455	470	466	468	469
12	1320	60	276	277	278	274	280	279
13	1320	300	425	423	426	420	435	426
14	1380	540	384	379	378	386	387	380
15	1380	780	438	440	441	439	436	432
16	1950	60	177	166	176	167	170	180
17	1950	480	105	100	99	107	106	105
18	1950	900	432	423	421	420	425	435
19	2520	60	142	141	142	154	139	140
20	2520	480	117	120	115	114	109	125
21	2520	1020	475	475	479	469	468	480
22	3000	60	73	78	74	75	73	69
23	3000	480	118	119	117	109	120	122
24	3000	1140	451	452	450	449	448	456




Data Fusion System
Please analyse the data.The panel provide editable and visual, global and local information for loaded data file
help
Load advise | Edit file | Proposal | Load Data | Statistics | Visualization | Abnormality | Report
Weight
General statistical information for the measurements
Shmit-Hammer 0 No information for this device
Covermeter(C) 0.6 All measurements=144 num.points=24 max=58 min=26 mid=41.173611111111114 St.Dev=7.4376944516966255
Covermeter(S) 0 No information for this device
Half Cell 0.4 All measurements=144 num.points=24 max=503 min=47 mid=284.2638888888889 St.Dev=157.2861623560282
Resistivity 0 No information for this device
update
Covermeter(C)
X 1544
Y 1664
go
zones 10
Approx level 1
Method
Clean
Splain
approx 2
MinVal=32
Y=750
alue is:35.64203445859472


Data Fusion System
Weight mixture information is presented on sensitive panels. Change the graphical scale from previous panel
help
Load advise | Edit file | Proposal | Load Data | Statistics | Visualization | Abnormality | Report
Concreet
Steel
Total
Clicked point
Total graph measurement point X=884 Y=899
Shmith-hammer: 0.0 % weight: 0
Covermether(C): 49.68099036366909 % weight: 0.6
Covermether(S): 0.0 % weight: 0
Half_Cell: 50.31900963633092 % weight: 0.4
Resistivity: 0.0 % weight: 0

R E P O R T

1) The initial expert file is C:\Program Files\Ziad\data\Example.exp.
From the proposal options the expert result string is: Water reacts on resistivity increasing the values and increase risk of corrosion.
&0.0,0.6,0.0,0.4,0.0.

2) The data file with name C:\Program Files\Ziad\data\testdata.dat was loaded.
The working data are:
Covermeter(C)
1 (6) SD=2.065591117977289, x=300, y=60 ,45,45,46,49,44,43
2 (6) SD=0.6324555320336759, x=300, y=420 ,45,45,45,45,46,44
3 (6) SD=1.7888543819998317, x=300, y=720 ,38,37,39,35,40,39
4 (6) SD=1.7511900715418263, x=750, y=60 ,36,35,37,38,33,35
5 (6) SD=2.7386127875258306, x=750, y=300 ,38,39,36,35,32,39
6 (6) SD=2.160246899469287, x=900, y=540 ,40,39,36,38,41,42
7 (6) SD=2.041241452319315, x=900, y=750 ,34,35,36,34,32,38
8 (6) SD=1.4142135623730951, x=1050, y=60 ,36,38,36,34,35,37
9 (6) SD=1.4719601443879744, x=1050, y=30 ,40,39,40,41,38,37
10 (6) SD=1.7224014243685084, x=1200, y=540 ,39,36,41,40,39,38
11 (6) SD=1.4719601443879744, x=1200, y=780 ,34,35,36,35,33,32
12 (6) SD=1.4719601443879744, x=1320, y=60 ,34,35,36,36,37,33
13 (6) SD=2.5298221281347035, x=1320, y=300 ,38,35,35,40,41,39
14 (6) SD=0.6324555320336759, x=1380, y=540 ,39,39,39,39,40,38
15 (6) SD=1.3662601021279464, x=1380, y=780 ,35,35,36,36,37,33
16 (6) SD=2.316606713852541, x=1950, y=60 ,53,55,54,49,50,52
17 (6) SD=2.786873995477131, x=1950, y=480 ,52,49,53,54,56,49
18 (6) SD=1.0327955589886444, x=1950, y=900 ,38,39,37,38,36,38
19 (6) SD=1.632993161855452, x=2520, y=60 ,58,57,58,56,54,55
20 (6) SD=1.0488088481701516, x=2520, y=480 ,51,52,51,50,49,50
21 (6) SD=2.8284271247461903, x=2520, y=1020 ,44,45,46,43,42,50
22 (6) SD=2.4221202832779936, x=3000, y=60 ,56,57,55,54,50,54
23 (6) SD=1.4142135623730951, x=3000, y=480 ,42,40,41,42,43,44
24 (6) SD=1.0327955589886446, x=3000, y=1140 ,28,27,28,29,26,28
Half Cell
1 (6) SD=3.011090610836324, x=300, y=60 ,104,104,103,102,100,109
2 (6) SD=1.4719601443879746, x=300, y=420 ,98,99,98,97,96,95
3 (6) SD=1.4142135623730951, x=300, y=720 ,69,67,68,69,70,71
4 (6) SD=81.5270916117254, x=750, y=60 ,246,250,249,47,243,245
5 (6) SD=2.9944392908634274, x=750, y=300 ,165,160,169,165,165,167
6 (6) SD=3.0605010483034745, x=900, y=540 ,490,489,487,495,494,490
7 (6) SD=4.926120853842978, x=900, y=750 ,415,420,412,413,415,425
8 (6) SD=4.1952353926806065, x=1050, y=60 ,344,342,346,349,339,338
9 (6) SD=4.47213595499958, x=1050, y=30 ,358,359,360,362,351,352
10 (6) SD=2.250925735484551, x=1200, y=540 ,498,501,503,497,499,498
11 (6) SD=5.468089245796926, x=1200, y=780 ,465,455,470,466,468,469
12 (6) SD=2.160246899469287, x=1320, y=60 ,276,277,278,274,280,279
13 (6) SD=5.036533199202271, x=1320, y=300 ,425,423,426,420,435,426
14 (6) SD=3.8297084310253524, x=1380, y=540 ,384,379,378,386,387,380
15 (6) SD=3.265986323710904, x=1380, y=780 ,438,440,441,439,436,432
16 (6) SD=5.7850381733111025, x=1950, y=60 ,177,166,176,167,170,180
17 (6) SD=3.32665998663324, x=1950, y=480 ,105,100,99,107,106,105
18 (6) SD=6.131883886702357, x=1950, y=900 ,432,423,421,420,425,435
19 (6) SD=5.513619500836088, x=2520, y=60 ,142,141,142,154,139,140
20 (6) SD=5.465040408511785, x=2520, y=480 ,117,120,115,114,109,125
21 (6) SD=4.96655480858378, x=2520, y=1020 ,475,475,479,469,468,480
22 (6) SD=2.943920288775949, x=3000, y=60 ,73,78,74,75,73,69
23 (6) SD=4.505552130427524, x=3000, y=480 ,118,119,117,109,120,122

24 (6) SD=2.8284271247461903, x=3000, y=1140 ,451,452,450,449,448,456.

3) The weights for the devices are:
0
0.6
0
0.4
0

4). Global analysis for the data show:
Device 1: No information for this device
Device 2: All measurements=144 num. points=24 max=58 min=26 mid=41.173611111111114 St. Dev=7.4376944516966255
Device 3: No information for this device
Device 4: All measurements=144 num. Points=24 max=503 min=47 mid=284.2638888888889 St. Dev=157.2861623560282
Device 5: No information for this device

5) Provided experiments for particular points:
==========
Covermeter(C) point: X=1544 Y=1664
The 4 closest points are:

Point 1 X=1950 Y=900
MaxVal=39 MinVal=36
Mean=37.666666666666664
Distance=865.177438448322
Zone 1 (36.0-36.6) =16.666666666666664%
Zone 2 (36.6-37.2) =16.666666666666664%
Zone 3 (37.2-37.8) =0.0%
Zone 4 (37.8-38.4) =50.0%
Zone 5 (38.4-39.0) =16.666666666666664%

Point 2 X=1380 Y=780
MaxVal=37 MinVal=33
Mean=35.333333333333336
Distance=899.083978280116
Zone 1 (33.0-33.8) =16.666666666666664%
Zone 2 (33.8-34.6) =0.0%
Zone 3 (34.6-35.4) =33.33333333333333%
Zone 4 (35.4-36.2) =33.33333333333333%
Zone 5 (36.2-37.0) =16.666666666666664%

Point 3 X=1200 Y=780
MaxVal=36 MinVal=32
Mean=34.166666666666664
Distance=948.5736660903042
Zone 1 (32.0-32.8) =16.666666666666664%
Zone 2 (32.8-33.6) =16.666666666666664%
Zone 3 (33.6-34.4) =16.666666666666664%
Zone 4 (34.4-35.2) =33.333333333333333%
Zone 5 (35.2-36.0) =16.666666666666664%

Point 4 X=900 Y=750
MaxVal=38 MinVal=32
Mean=34.833333333333336
Distance=1118.0930193861332
Zone 1 (32.0-33.2) =16.666666666666664%
Zone 2 (33.2-34.4) =33.33333333333333%
Zone 3 (34.4-35.6) =16.666666666666664%
Zone 4 (35.6-36.8) =16.666666666666664%

```
 Zone 5 (36.8-38.0) =16.666666666666664%
==========
 Approx. value is:35.64203445859472

 6) Provided visualization point's checking analyse:

 Concrete graph measurement point X=1155  Y=1289
 Schmidt-Hammer data:  0.0 % weight: 0
     Covermeter(C):  100.00000000000001 % weight: 0.6

 Steel graph measurement point X=419  Y=540
 Covermeter(S):  0.0 % weight: 0
      Half-Cell:  100.0 % weight: 0.4
    Resistivity:  0.0 % weight: 0

 Total graph measurement point X=884  Y=899
  Schmidt-Hammer:  0.0 % weight: 0
 Covermeter(C):  49.68099036366909 % weight: 0.6
 Covermeter(S):  0.0 % weight: 0
      Half-Cell:  50.31900963633092 % weight: 0.4
    Resistivity:  0.0 % weight: 0

 7). Abnormality experiments:

-------- STANDART DEVIATION--------
SD in device: 1 = 7.4376944516966255
SD in device: 3 = 157.2861623560282
------------------------
Big standard dev in device:3 = 157.2861623560282

 -------MAX/MIN-------
 Device 1
1 Max = 49 Min = 43
2 Max = 46 Min = 44
3 Max = 40 Min = 35
4 Max = 38 Min = 33
5 Max = 39 Min = 32
6 Max = 42 Min = 36
7 Max = 38 Min = 32
8 Max = 38 Min = 34
9 Max = 41 Min = 37
10 Max = 41 Min = 36
11 Max = 36 Min = 32
12 Max = 37 Min = 33
13 Max = 41 Min = 35
14 Max = 40 Min = 38
15 Max = 37 Min = 33
16 Max = 55 Min = 49
17 Max = 56 Min = 49
18 Max = 39 Min = 36
19 Max = 58 Min = 54
20 Max = 52 Min = 49
21 Max = 50 Min = 42
22 Max = 57 Min = 50
23 Max = 44 Min = 40
24 Max = 29 Min = 26
 ------------------
 Device 3
1 Max = 109 Min = 100
2 Max = 99 Min = 95
```

```
3 Max = 71 Min = 67
4 Max = 250 Min = 47
5 Max = 169 Min = 160
6 Max = 495 Min = 487
7 Max = 425 Min = 412
8 Max = 349 Min = 338
9 Max = 362 Min = 351
10 Max = 503 Min = 497
11 Max = 470 Min = 455
12 Max = 280 Min = 274
13 Max = 435 Min = 420
14 Max = 387 Min = 378
15 Max = 441 Min = 432
16 Max = 180 Min = 166
17 Max = 107 Min = 99
18 Max = 435 Min = 420
19 Max = 154 Min = 139
20 Max = 125 Min = 109
21 Max = 480 Min = 468
22 Max = 78 Min = 69
23 Max = 122 Min = 109
24 Max = 456 Min = 448
 ------------------
 ----WEIGHT----
 Device weight
 0     0
 1     0.6
 2     0
 3     0.4
 4     0
 Irrelevant data < > +-(1.0 * SD)+mean
 Device 1
1 x= 300 y= 300 (49) mid=45.333333333333336 SD=2.065591117977289 dev.
from mean:3.6666666666666643
1 x= 300 y= 300 (43) mid=45.333333333333336 SD=2.065591117977289 dev.
from mean:2.3333333333333357
2  x=  300  y=  300  (46)  mid=45.0  SD=0.6324555320336759  dev.  from
mean:1.0
2  x=  300  y=  300  (44)  mid=45.0  SD=0.6324555320336759  dev.  from
mean:1.0
3  x=  300  y=  300  (35)  mid=38.0  SD=1.7888543819998317  dev.  from
mean:3.0
3  x=  300  y=  300  (40)  mid=38.0  SD=1.7888543819998317  dev.  from
mean:2.0
4 x= 750 y= 750 (38) mid=35.666666666666664 SD=1.7511900715418263 dev.
from mean:2.3333333333333357
4 x= 750 y= 750 (33) mid=35.666666666666664 SD=1.7511900715418263 dev.
from mean:2.6666666666666643
5  x=  750  y=  750  (32)  mid=36.5  SD=2.7386127875258306  dev.  from
mean:4.5
6 x= 900 y= 900 (36) mid=39.333333333333336 SD=2.160246899469287 dev.
from mean:3.3333333333333357
6 x= 900 y= 900 (42) mid=39.333333333333336 SD=2.160246899469287 dev.
from mean:2.6666666666666643
7 x= 900 y= 900 (32) mid=34.833333333333336 SD=2.041241452319315 dev.
from mean:2.8333333333333357
7 x= 900 y= 900 (38) mid=34.833333333333336 SD=2.041241452319315 dev.
from mean:3.1666666666666643
8  x=  1050  y=  1050  (38)  mid=36.0  SD=1.4142135623730951  dev.  from
mean:2.0
```

8 x= 1050 y= 1050 (34) mid=36.0 SD=1.4142135623730951 dev. from mean:2.0
9 x= 1050 y= 1050 (41) mid=39.166666666666664 SD=1.4719601443879744 dev. from mean:1.8333333333333357
9 x= 1050 y= 1050 (37) mid=39.166666666666664 SD=1.4719601443879744 dev. from mean:2.1666666666666643
10 x= 1200 y= 1200 (36) mid=38.833333333333336 SD=1.7224014243685084 dev. from mean:2.8333333333333357
10 x= 1200 y= 1200 (41) mid=38.833333333333336 SD=1.7224014243685084 dev. from mean:2.1666666666666643
11 x= 1200 y= 1200 (36) mid=34.166666666666664 SD=1.4719601443879744 dev. from mean:1.8333333333333357
11 x= 1200 y= 1200 (32) mid=34.166666666666664 SD=1.4719601443879744 dev. from mean:2.1666666666666643
12 x= 1320 y= 1320 (37) mid=35.166666666666664 SD=1.4719601443879744 dev. from mean:1.8333333333333357
12 x= 1320 y= 1320 (33) mid=35.166666666666664 SD=1.4719601443879744 dev. from mean:2.1666666666666643
13 x= 1320 y= 1320 (35) mid=38.0 SD=2.5298221281347035 dev. from mean:3.0
13 x= 1320 y= 1320 (35) mid=38.0 SD=2.5298221281347035 dev. from mean:3.0
13 x= 1320 y= 1320 (41) mid=38.0 SD=2.5298221281347035 dev. from mean:3.0
14 x= 1380 y= 1380 (40) mid=39.0 SD=0.6324555320336759 dev. from mean:1.0
14 x= 1380 y= 1380 (38) mid=39.0 SD=0.6324555320336759 dev. from mean:1.0
15 x= 1380 y= 1380 (37) mid=35.333333333333336 SD=1.3662601021279464 dev. from mean:1.6666666666666643
15 x= 1380 y= 1380 (33) mid=35.333333333333336 SD=1.3662601021279464 dev. from mean:2.3333333333333357
16 x= 1950 y= 1950 (55) mid=52.166666666666664 SD=2.316606713852541 dev. from mean:2.8333333333333357
16 x= 1950 y= 1950 (49) mid=52.166666666666664 SD=2.316606713852541 dev. from mean:3.1666666666666643
17 x= 1950 y= 1950 (49) mid=52.166666666666664 SD=2.786873995477131 dev. from mean:3.1666666666666643
17 x= 1950 y= 1950 (56) mid=52.166666666666664 SD=2.786873995477131 dev. from mean:3.8333333333333357
17 x= 1950 y= 1950 (49) mid=52.166666666666664 SD=2.786873995477131 dev. from mean:3.1666666666666643
18 x= 1950 y= 1950 (39) mid=37.666666666666664 SD=1.0327955589886444 dev. from mean:1.3333333333333357
18 x= 1950 y= 1950 (36) mid=37.666666666666664 SD=1.0327955589886444 dev. from mean:1.6666666666666643
19 x= 2520 y= 2520 (58) mid=56.333333333333336 SD=1.632993161855452 dev. from mean:1.6666666666666643
19 x= 2520 y= 2520 (58) mid=56.333333333333336 SD=1.632993161855452 dev. from mean:1.6666666666666643
19 x= 2520 y= 2520 (54) mid=56.333333333333336 SD=1.632993161855452 dev. from mean:2.3333333333333357
20 x= 2520 y= 2520 (52) mid=50.5 SD=1.0488088481701516 dev. from mean:1.5
20 x= 2520 y= 2520 (49) mid=50.5 SD=1.0488088481701516 dev. from mean:1.5
21 x= 2520 y= 2520 (42) mid=45.0 SD=2.8284271247461903 dev. from mean:3.0
21 x= 2520 y= 2520 (50) mid=45.0 SD=2.8284271247461903 dev. from mean:5.0

22 x= 3000 y= 3000 (57) mid=54.333333333333336 SD=2.4221202832779936
dev. from mean:2.6666666666666643
22 x= 3000 y= 3000 (50) mid=54.333333333333336 SD=2.4221202832779936
dev. from mean:4.333333333333336
23 x= 3000 y= 3000 (40) mid=42.0 SD=1.4142135623730951 dev. from
mean:2.0
23 x= 3000 y= 3000 (44) mid=42.0 SD=1.4142135623730951 dev. from
mean:2.0
24 x= 3000 y= 3000 (29) mid=27.666666666666668 SD=1.0327955589886446
dev. from mean:1.3333333333333321
24 x= 3000 y= 3000 (26) mid=27.666666666666668 SD=1.0327955589886446
dev. from mean:1.6666666666666679
Device 3
1 x= 300 y= 300 (100) mid=103.66666666666667 SD=3.011090610836324 dev.
from mean:3.6666666666666714
1 x= 300 y= 300 (109) mid=103.66666666666667 SD=3.011090610836324 dev.
from mean:5.333333333333329
2 x= 300 y= 300 (99) mid=97.16666666666667 SD=1.4719601443879746 dev.
from mean:1.8333333333333286
2 x= 300 y= 300 (95) mid=97.16666666666667 SD=1.4719601443879746 dev.
from mean:2.1666666666666714
3 x= 300 y= 300 (67) mid=69.0 SD=1.4142135623730951 dev. from
mean:2.0
3 x= 300 y= 300 (71) mid=69.0 SD=1.4142135623730951 dev. from
mean:2.0
4 x= 750 y= 750 (47) mid=213.33333333333334 SD=81.5270916117254 dev.
from mean:166.33333333333334
5 x= 750 y= 750 (160) mid=165.16666666666666 SD=2.9944392908634274
dev. from mean:5.166666666666657
5 x= 750 y= 750 (169) mid=165.16666666666666 SD=2.9944392908634274
dev. from mean:3.833333333333343
6 x= 900 y= 900 (487) mid=490.8333333333333 SD=3.0605010483034745 dev.
from mean:3.8333333333333144
6 x= 900 y= 900 (495) mid=490.8333333333333 SD=3.0605010483034745 dev.
from mean:4.166666666666686
6 x= 900 y= 900 (494) mid=490.8333333333333 SD=3.0605010483034745 dev.
from mean:3.1666666666666856
7 x= 900 y= 900 (425) mid=416.6666666666667 SD=4.926120853842978 dev.
from mean:8.333333333333314
8 x= 1050 y= 1050 (349) mid=343.0 SD=4.1952353926806065 dev. from
mean:6.0
8 x= 1050 y= 1050 (338) mid=343.0 SD=4.1952353926806065 dev. from
mean:5.0
9 x= 1050 y= 1050 (362) mid=357.0 SD=4.47213595499958 dev. from
mean:5.0
9 x= 1050 y= 1050 (351) mid=357.0 SD=4.47213595499958 dev. from
mean:6.0
9 x= 1050 y= 1050 (352) mid=357.0 SD=4.47213595499958 dev. from
mean:5.0
10 x= 1200 y= 1200 (503) mid=499.3333333333333 SD=2.250925735484551
dev. from mean:3.6666666666666856
10 x= 1200 y= 1200 (497) mid=499.3333333333333 SD=2.250925735484551
dev. from mean:2.3333333333333144
11 x= 1200 y= 1200 (455) mid=465.5 SD=5.468089245796926 dev. from
mean:10.5
12 x= 1320 y= 1320 (274) mid=277.3333333333333 SD=2.160246899469287
dev. from mean:3.3333333333333144
12 x= 1320 y= 1320 (280) mid=277.3333333333333 SD=2.160246899469287
dev. from mean:2.6666666666666856
13 x= 1320 y= 1320 (420) mid=425.8333333333333 SD=5.036533199202271
dev. from mean:5.833333333333314

13 x= 1320 y= 1320 (435) mid=425.8333333333333 SD=5.036533199202271
dev. from mean:9.166666666666686
14 x= 1380 y= 1380 (378) mid=382.3333333333333 SD=3.8297084310253524
dev. from mean:4.333333333333314
14 x= 1380 y= 1380 (387) mid=382.3333333333333 SD=3.8297084310253524
dev. from mean:4.666666666666686
15 x= 1380 y= 1380 (441) mid=437.6666666666667 SD=3.265986323710904
dev. from mean:3.3333333333333144
15 x= 1380 y= 1380 (432) mid=437.6666666666667 SD=3.265986323710904
dev. from mean:5.666666666666686
16 x= 1950 y= 1950 (166) mid=172.66666666666666 SD=5.7850381733111025
dev. from mean:6.666666666666657
16 x= 1950 y= 1950 (180) mid=172.66666666666666 SD=5.7850381733111025
dev. from mean:7.333333333333343
17 x= 1950 y= 1950 (100) mid=103.66666666666667 SD=3.32665998663324
dev. from mean:3.6666666666666714
17 x= 1950 y= 1950 (99) mid=103.66666666666667 SD=3.32665998663324
dev. from mean:4.666666666666671
17 x= 1950 y= 1950 (107) mid=103.66666666666667 SD=3.32665998663324
dev. from mean:3.3333333333333286
18 x= 1950 y= 1950 (435) mid=426.0 SD=6.131883886702357 dev. from
mean:9.0
19 x= 2520 y= 2520 (154) mid=143.0 SD=5.513619500836088 dev. from
mean:11.0
20 x= 2520 y= 2520 (109) mid=116.66666666666667 SD=5.465040408511785
dev. from mean:7.666666666666671
20 x= 2520 y= 2520 (125) mid=116.66666666666667 SD=5.465040408511785
dev. from mean:8.333333333333329
21 x= 2520 y= 2520 (469) mid=474.3333333333333 SD=4.96655480858378
dev. from mean:5.333333333333314
21 x= 2520 y= 2520 (468) mid=474.3333333333333 SD=4.96655480858378
dev. from mean:6.333333333333314
21 x= 2520 y= 2520 (480) mid=474.3333333333333 SD=4.96655480858378
dev. from mean:5.666666666666686
22 x= 3000 y= 3000 (78) mid=73.66666666666667 SD=2.943920288775949
dev. from mean:4.333333333333329
22 x= 3000 y= 3000 (69) mid=73.66666666666667 SD=2.943920288775949
dev. from mean:4.666666666666671
23 x= 3000 y= 3000 (109) mid=117.5 SD=4.505552130427524 dev. from
mean:8.5
24 x= 3000 y= 3000 (448) mid=451.0 SD=2.8284271247461903 dev. from
mean:3.0
24 x= 3000 y= 3000 (456) mid=451.0 SD=2.8284271247461903 dev. from
mean:5.0
Graphics mix information
Concrete
max in x=2280.0 y=299.99997,
min in x=2459.9998 y=1379.9999,
Steel
max in x=1155.0 y=359.99997,
min in x=599.99994 y=1095.0,
Total
max in x=2744.9998 y=749.99994,
min in x=704.99994 y=1229.9999,

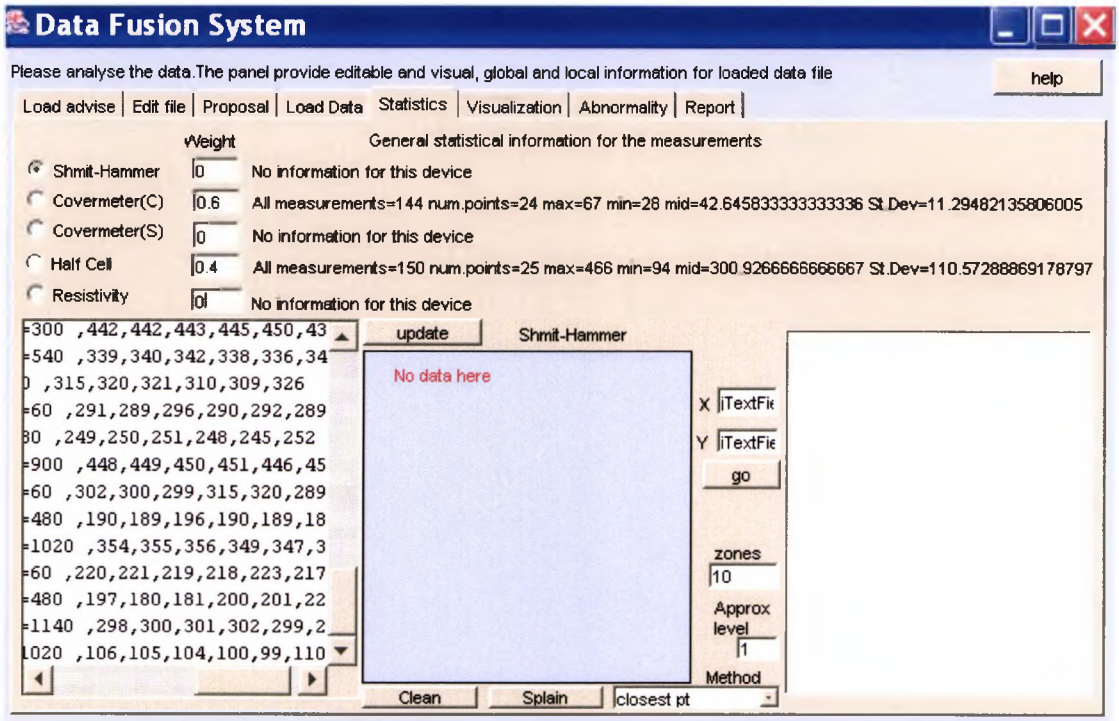
South 6

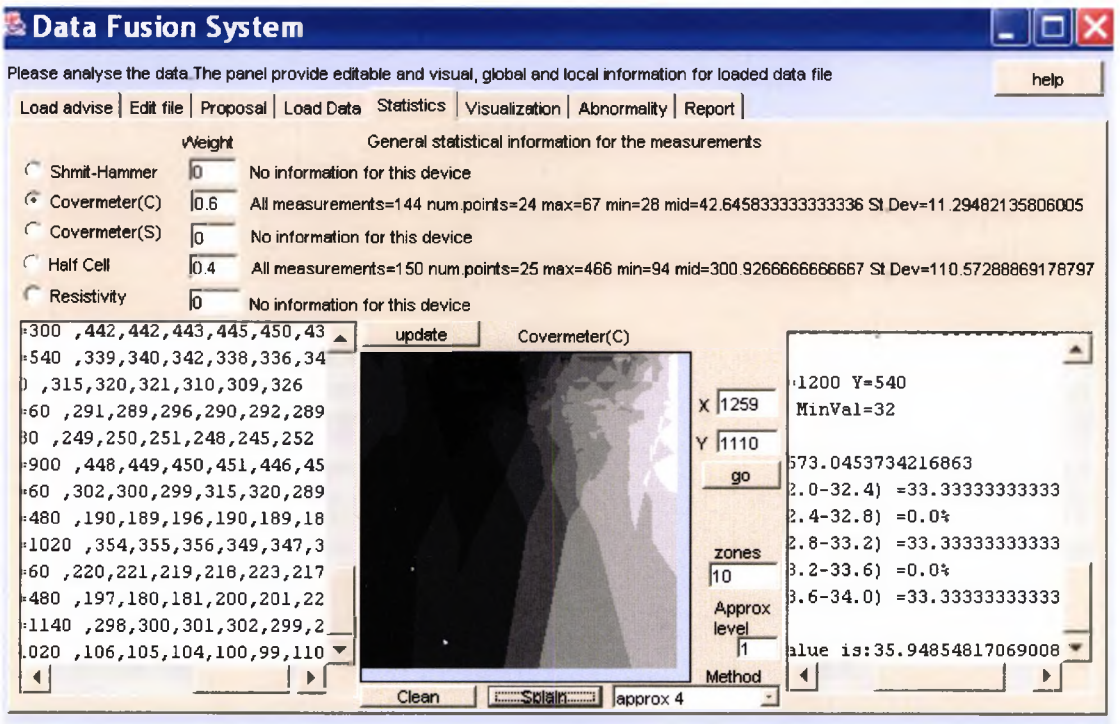
Covermeter

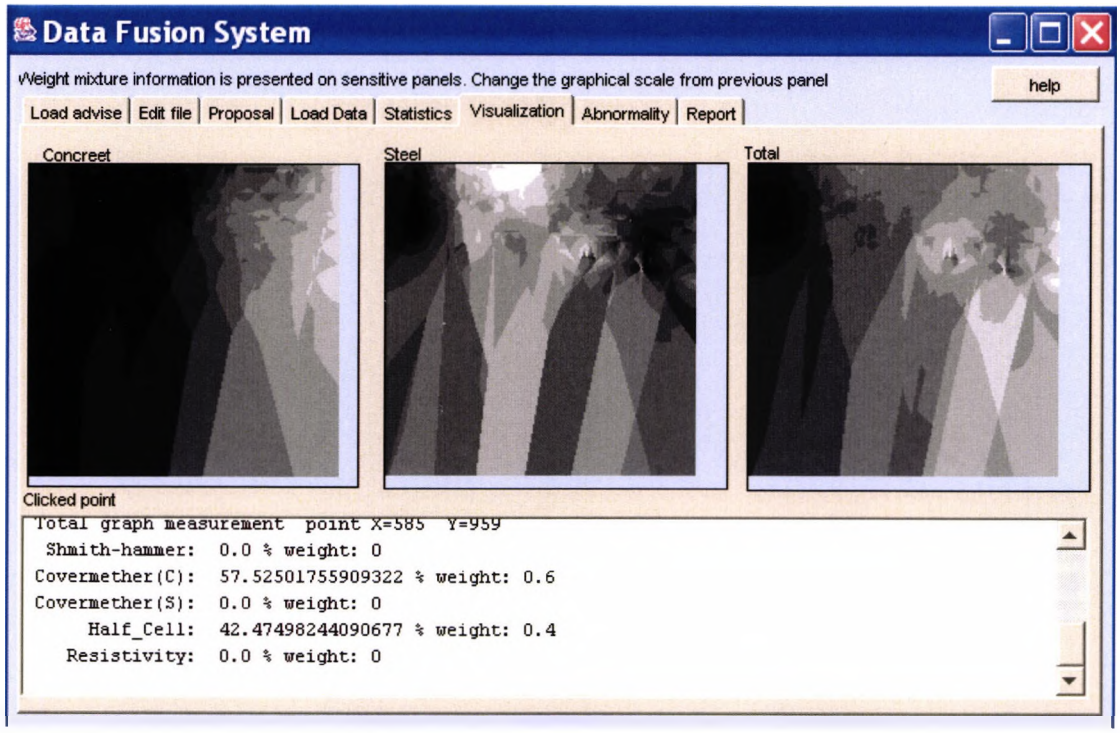
Point	x	y	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6
1	300	60	40	40	39	38	41	42
2	300	420	38	39	38	38	37	38
3	300	720	39	39	40	41	39	38
4	750	60	30	29	29	31	31	32
5	750	300	32	33	32	32	33	31
6	900	540	33	31	32	33	34	32
7	900	750	31	30	29	33	32	31
8	1050	60	38	37	37	38	39	39
9	1050	30	33	32	33	32	34	32
10	1200	540	33	32	32	33	34	34
11	1200	780	37	36	35	38	37	36
12	1320	60	30	29	28	31	32	31
13	1320	300	30	29	30	31	32	30
14	1380	540	40	39	38	40	41	42
15	1380	780	41	42	41	40	39	43
16	1950	60	48	45	46	48	43	50
17	1950	480	53	52	54	55	51	53
18	1950	900	48	49	49	48	47	46
19	2520	60	46	46	47	45	48	46
20	2520	480	58	58	59	54	56	57
21	2520	1020	57	58	56	59	54	58
22	3000	60	63	65	62	61	67	66
23	3000	480	63	63	64	65	60	59
24	3000	1140	64	65	63	62	67	65

Half Cell

Point	x	y	Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Reading 6
1	300	60	148	147	150	151	148	149
2	300	420	109	105	110	111	112	103
3	300	720	97	95	98	97	96	94
4	750	60	392	390	389	395	396	387
5	750	300	319	320	325	315	314	310
6	900	540	373	370	375	369	368	374
7	900	750	403	401	399	405	406	403
8	1050	60	393	395	396	390	389	390
9	1050	30	463	465	460	466	463	460
10	1200	540	346	345	346	340	350	341
11	1200	780	280	279	278	281	285	280
12	1320	60	450	451	450	449	448	452
13	1320	300	442	442	443	445	450	439
14	1380	540	339	340	342	338	336	345
15	1380	780	315	320	321	310	309	326
16	1950	60	291	289	296	290	292	289
17	1950	480	249	250	251	248	245	252
18	1950	900	448	449	450	451	446	453
19	2520	60	302	300	299	315	320	289
20	2520	480	190	189	196	190	189	187
21	2520	1020	354	355	356	349	347	351
22	3000	60	220	221	219	218	223	217
23	3000	480	197	180	181	200	201	223
24	3000	1140	298	300	301	302	299	297


Data Fusion System
Please analyse the data.The panel provide editable and visual, global and local information for loaded data file
help
Load advise | Edit file | Proposal | Load Data | Statistics | Visualization | Abnormality | Report
Weight
General statistical information for the measurements
Shmit-Hammer 0 No information for this device
Covermeter(C) 0.6 All measurements=144 num.points=24 max=67 min=28 mid=42.645833333333336 St.Dev=11.29482135806005
Covermeter(S) 0 No information for this device
Half Cell 0.4 All measurements=150 num.points=25 max=466 min=94 mid=300.9266666666667 St.Dev=110.57288869178797
Resistivity 0 No information for this device
=300 ,442,442,443,445,450,43
=540 ,339,340,342,338,336,34
) ,315,320,321,310,309,326
=60 ,291,289,296,290,292,289
30 ,249,250,251,248,245,252
=900 ,448,449,450,451,446,45
=60 ,302,300,299,315,320,289
=480 ,190,189,196,190,189,18
=1020 ,354,355,356,349,347,3
=60 ,220,221,219,218,223,217
=480 ,197,180,181,200,201,22
=1140 ,298,300,301,302,299,2
1020 ,106,105,104,100,99,110
update
Shmit-Hammer
No data here
X iTextFie
Y iTextFie
go
zones
10
Approx level
1
Method
Clean
Splain
closest pt


Data Fusion System
Please analyse the data.The panel provide editable and visual, global and local information for loaded data file
help
Load advise | Edit file | Proposal | Load Data | Statistics | Visualization | Abnormality | Report
Weight
General statistical information for the measurements
Shmit-Hammer 0 No information for this device
Covermeter(C) 0.6 All measurements=144 num.points=24 max=67 min=28 mid=42.645833333333336 St.Dev=11.29482135806005
Covermeter(S) 0 No information for this device
Half Cell 0.4 All measurements=150 num.points=25 max=466 min=94 mid=300.9266666666667 St.Dev=110.57288869178797
Resistivity 0 No information for this device
=300 ,442,442,443,445,450,43
=540 ,339,340,342,338,336,34
) ,315,320,321,310,309,326
=60 ,291,289,296,290,292,289
30 ,249,250,251,248,245,252
=900 ,448,449,450,451,446,45
=60 ,302,300,299,315,320,289
=480 ,190,189,196,190,189,18
=1020 ,354,355,356,349,347,3
=60 ,220,221,219,218,223,217
=480 ,197,180,181,200,201,22
=1140 ,298,300,301,302,299,2
1020 ,106,105,104,100,99,110
update
Covermeter(C)
X 1259
Y 1110
go
zones
10
Approx level
1
Method
Clean
Splain
approx 4
1200 Y=540
MinVal=32
573.0453734216863
2.0-32.4) =33.33333333333
2.4-32.8) =0.0%
2.8-33.2) =33.33333333333
3.2-33.6) =0.0%
3.6-34.0) =33.33333333333
alue is:35.94854817069008


Data Fusion System
Weight mixture information is presented on sensitive panels. Change the graphical scale from previous panel
help
Load advise
Edit file
Proposal
Load Data
Statistics
Visualization
Abnormality
Report
Concreet
Steel
Total
Clicked point
Total graph measurement point X=585 Y=959
Shmith-hammer: 0.0 % weight: 0
Covermether(C): 57.52501755909322 % weight: 0.6
Covermether(S): 0.0 % weight: 0
Half_Cell: 42.47498244090677 % weight: 0.4
Resistivity: 0.0 % weight: 0

R E P O R T

1) The initial expert file is C:\Program Files\Ziad\data\Example.exp.
From the proposal options the expert result string is: Water react on resistivity increasing the values and increase risk of corrosion.
&0.0,0.6,0.0,0.4,0.0.

2) The data file with name C:\Program Files\Ziad\data\testdata.dat was loaded.
The working data are:
Covermeter(C)
1 (6) SD=1.4142135623730951, x=300, y=60 ,40,40,39,38,41,42
2 (6) SD=0.6324555320336759, x=300, y=420 ,38,39,38,38,37,38
3 (6) SD=1.0327955589886444, x=300, y=720 ,39,39,40,41,39,38
4 (6) SD=1.2110601416389968, x=750, y=60 ,30,29,29,31,31,32
5 (6) SD=0.752772652709081, x=750, y=300 ,32,33,32,32,33,31
6 (6) SD=1.0488088481701516, x=900, y=540 ,33,31,32,33,34,32
7 (6) SD=1.4142135623730951, x=900, y=750 ,31,30,29,33,32,31
8 (6) SD=0.8944271909999159, x=1050, y=60 ,38,37,37,38,39,39
9 (6) SD=0.816496580927726, x=1050, y=30 ,33,32,33,32,34,32
10 (6) SD=0.8944271909999159, x=1200, y=540 ,33,32,32,33,34,34
11 (6) SD=1.0488088481701516, x=1200, y=780 ,37,36,35,38,37,36
12 (6) SD=1.4719601443879746, x=1320, y=60 ,30,29,28,31,32,31
13 (6) SD=1.0327955589886446, x=1320, y=300 ,30,29,30,31,32,30
14 (6) SD=1.4142135623730951, x=1380, y=540 ,40,39,38,40,41,42
15 (6) SD=1.4142135623730951, x=1380, y=780 ,41,42,41,40,39,43
16 (6) SD=2.503331114069145, x=1950, y=60 ,48,45,46,48,43,50
17 (6) SD=1.4142135623730951, x=1950, y=480 ,53,52,54,55,51,53
18 (6) SD=1.1690451944500122, x=1950, y=900 ,48,49,49,48,47,46
19 (6) SD=1.0327955589886444, x=2520, y=60 ,46,46,47,45,48,46
20 (6) SD=1.7888543819998317, x=2520, y=480 ,58,58,59,54,56,57
21 (6) SD=1.7888543819998317, x=2520, y=1020 ,57,58,56,59,54,58
22 (6) SD=2.3664319132398464, x=3000, y=60 ,63,65,62,61,67,66
23 (6) SD=2.3380903889000244, x=3000, y=480 ,63,63,64,65,60,59
24 (6) SD=1.7511900715418263, x=3000, y=1140 ,64,65,63,62,67,65
Half Cell
1 (6) SD=1.4719601443879746, x=300, y=60 ,148,147,150,151,148,149
2 (6) SD=3.559026084010437, x=300, y=420 ,109,105,110,111,112,103
3 (6) SD=1.4719601443879746, x=300, y=720 ,97,95,98,97,96,94
4 (6) SD=3.5071355833500366, x=750, y=60 ,392,390,389,395,396,387
5 (6) SD=5.269408568963567, x=750, y=300 ,319,320,325,315,314,310
6 (6) SD=2.8809720581775866, x=900, y=540 ,373,370,375,369,368,374
7 (6) SD=2.562550812504343, x=900, y=750 ,403,401,399,405,406,403
8 (6) SD=2.9268868558020253, x=1050, y=60 ,393,395,396,390,389,390
9 (6) SD=2.48327740429189, x=1050, y=30 ,463,465,460,466,463,460
10 (6) SD=3.6696957185394363, x=1200, y=540 ,346,345,346,340,350,341
11 (6) SD=2.4289915602982237, x=1200, y=780 ,280,279,278,281,285,280
12 (6) SD=1.4142135623730951, x=1320, y=60 ,450,451,450,449,448,452
13 (6) SD=3.7282703764614498, x=1320, y=300 ,442,442,443,445,450,439
14 (6) SD=3.1622776601683795, x=1380, y=540 ,339,340,342,338,336,345
15 (6) SD=6.6758270399005, x=1380, y=780 ,315,320,321,310,309,326
16 (6) SD=2.6394443859772205, x=1950, y=60 ,291,289,296,290,292,289
17 (6) SD=2.48327740429189, x=1950, y=480 ,249,250,251,248,245,252
18 (6) SD=2.4289915602982237, x=1950, y=900 ,448,449,450,451,446,453
19 (6) SD=11.373946837693003, x=2520, y=60 ,302,300,299,315,320,289
20 (6) SD=3.0605010483034745, x=2520, y=480 ,190,189,196,190,189,187
21 (6) SD=3.5777087639996634, x=2520, y=1020 ,354,355,356,349,347,351
22 (6) SD=2.1602468994692865, x=3000, y=60 ,220,221,219,218,223,217
23 (6) SD=15.786069808536892, x=3000, y=480 ,197,180,181,200,201,223
24 (6) SD=1.8708286933869707, x=3000, y=1140 ,298,300,301,302,299,297

25 (6) SD=4.049691346263317, x=2520, y=1020 ,106,105,104,100,99,110.

3) The weights for the devices are:
0
0.6
0
0.4
0

4). Global analysis for the data show:
Device 1: No information for this device
Device 2: All measurements=144 num. points=24 max=67 min=28 mid=42.645833333333336 St. Dev=11.29482135806005
Device 3: No information for this device
Device 4: All measurements=150 num. points=25 max=466 min=94 mid=300.9266666666667 St. Dev=110.57288869178797
Device 5: No information for this device

5) Provided experiments for particular points:
==========
Covermeter(C) point: X=1259 Y=1110
The 4 closest points are:

Point 1 X=1200 Y=780
MaxVal=38 MinVal=35
Mean=36.5
Distance=335.2327549628765
Zone 1 (35.0-35.6) =16.666666666666664%
Zone 2 (35.6-36.2) =33.33333333333333%
Zone 3 (36.2-36.8) =0.0%
Zone 4 (36.8-37.4) =33.33333333333333%
Zone 5 (37.4-38.0) =16.666666666666664%

Point 2 X=1380 Y=780
MaxVal=43 MinVal=39
Mean=41.0
Distance=351.48399679075004
Zone 1 (39.0-39.8) =16.666666666666664%
Zone 2 (39.8-40.6) =16.666666666666664%
Zone 3 (40.6-41.4) =33.33333333333333%
Zone 4 (41.4-42.2) =16.666666666666664%
Zone 5 (42.2-43.0) =16.666666666666664%

Point 3 X=900 Y=750
MaxVal=33 MinVal=29
Mean=31.0
Distance=508.4102674022231
Zone 1 (29.0-29.8) =16.666666666666664%
Zone 2 (29.8-30.6) =16.666666666666664%
Zone 3 (30.6-31.4) =33.33333333333333%
Zone 4 (31.4-32.2) =16.666666666666664%
Zone 5 (32.2-33.0) =16.666666666666664%

Point 4 X=1200 Y=540
MaxVal=34 MinVal=32
Mean=33.0
Distance=573.0453734216863
Zone 1 (32.0-32.4) =33.33333333333333%
Zone 2 (32.4-32.8) =0.0%
Zone 3 (32.8-33.2) =33.33333333333333%
Zone 4 (33.2-33.6) =0.0%

```
 Zone 5 (33.6-34.0) =33.333333333333333%
==========
 Approx. value is:35.94854817069008

 6) Provided visualization point's checking analyse:

 Concrete graph measurement point X=974  Y=1634
 Schmidt-Hammer data:  0.0 % weight: 0
     Covermeter(C):  100.0 % weight: 0.6

 Steel graph measurement point X=555  Y=1379
 Covermeter(S):  0.0 % weight: 0
      Half-Cell:  100.0 % weight: 0.4
    Resistivity:  0.0 % weight: 0

 Total graph measurement point X=585  Y=959
  Schmidt-Hammer:  0.0 % weight: 0
 Covermeter(C):  57.52501755909322 % weight: 0.6
 Covermeter(S):  0.0 % weight: 0
      Half-Cell:  42.47498244090677 % weight: 0.4
    Resistivity:  0.0 % weight: 0

 7). Abnormality experiments:

-------- STANDART DEVIATION--------
SD in device: 1 = 11.29482135806005
SD in device: 3 = 110.57288869178797
------------------------
Big standard dev in device:3 = 110.57288869178797

 -------MAX/MIN-------
 Device 1
1 Max = 42 Min = 38
2 Max = 39 Min = 37
3 Max = 41 Min = 38
4 Max = 32 Min = 29
5 Max = 33 Min = 31
6 Max = 34 Min = 31
7 Max = 33 Min = 29
8 Max = 39 Min = 37
9 Max = 34 Min = 32
10 Max = 34 Min = 32
11 Max = 38 Min = 35
12 Max = 32 Min = 28
13 Max = 32 Min = 29
14 Max = 42 Min = 38
15 Max = 43 Min = 39
16 Max = 50 Min = 43
17 Max = 55 Min = 51
18 Max = 49 Min = 46
19 Max = 48 Min = 45
20 Max = 59 Min = 54
21 Max = 59 Min = 54
22 Max = 67 Min = 61
23 Max = 65 Min = 59
24 Max = 67 Min = 62
 ------------------
 Device 3
1 Max = 151 Min = 147
2 Max = 112 Min = 103
```

```
3 Max = 98 Min = 94
4 Max = 396 Min = 387
5 Max = 325 Min = 310
6 Max = 375 Min = 368
7 Max = 406 Min = 399
8 Max = 396 Min = 389
9 Max = 466 Min = 460
10 Max = 350 Min = 340
11 Max = 285 Min = 278
12 Max = 452 Min = 448
13 Max = 450 Min = 439
14 Max = 345 Min = 336
15 Max = 326 Min = 309
16 Max = 296 Min = 289
17 Max = 252 Min = 245
18 Max = 453 Min = 446
19 Max = 320 Min = 289
20 Max = 196 Min = 187
21 Max = 356 Min = 347
22 Max = 223 Min = 217
23 Max = 223 Min = 180
24 Max = 302 Min = 297
25 Max = 110 Min = 99
 ------------------
 ----WEIGHT----
 Device weight
 0     0
 1     0.6
 2     0
 3     0.4
 4     0
 Irrelevant data < > +-(1.0 * SD)+mean
 Device 1
1  x=  300  y=  300  (38)  mid=40.0  SD=1.4142135623730951  dev.  from
mean:2.0
1  x=  300  y=  300  (42)  mid=40.0  SD=1.4142135623730951  dev.  from
mean:2.0
2  x=  300  y=  300  (39)  mid=38.0  SD=0.6324555320336759  dev.  from
mean:1.0
2  x=  300  y=  300  (37)  mid=38.0  SD=0.6324555320336759  dev.  from
mean:1.0
3 x= 300 y= 300 (41) mid=39.333333333333336 SD=1.0327955589886444 dev.
from mean:1.6666666666666643
3 x= 300 y= 300 (38) mid=39.333333333333336 SD=1.0327955589886444 dev.
from mean:1.3333333333333357
4 x= 750 y= 750 (29) mid=30.333333333333332 SD=1.2110601416389968 dev.
from mean:1.3333333333333321
4 x= 750 y= 750 (29) mid=30.333333333333332 SD=1.2110601416389968 dev.
from mean:1.3333333333333321
4 x= 750 y= 750 (32) mid=30.333333333333332 SD=1.2110601416389968 dev.
from mean:1.6666666666666679
5 x= 750 y= 750 (33) mid=32.166666666666664 SD=0.752772652709081 dev.
from mean:0.8333333333333357
5 x= 750 y= 750 (33) mid=32.166666666666664 SD=0.752772652709081 dev.
from mean:0.8333333333333357
5 x= 750 y= 750 (31) mid=32.166666666666664 SD=0.752772652709081 dev.
from mean:1.1666666666666643
6  x=  900  y=  900  (31)  mid=32.5  SD=1.0488088481701516  dev.  from
mean:1.5
6  x=  900  y=  900  (34)  mid=32.5  SD=1.0488088481701516  dev.  from
mean:1.5
```

7 x= 900 y= 900 (29) mid=31.0 SD=1.4142135623730951 dev. from mean:2.0
7 x= 900 y= 900 (33) mid=31.0 SD=1.4142135623730951 dev. from mean:2.0
8 x= 1050 y= 1050 (37) mid=38.0 SD=0.8944271909999159 dev. from mean:1.0
8 x= 1050 y= 1050 (37) mid=38.0 SD=0.8944271909999159 dev. from mean:1.0
8 x= 1050 y= 1050 (39) mid=38.0 SD=0.8944271909999159 dev. from mean:1.0
8 x= 1050 y= 1050 (39) mid=38.0 SD=0.8944271909999159 dev. from mean:1.0
9 x= 1050 y= 1050 (34) mid=32.666666666666664 SD=0.816496580927726 dev. from mean:1.3333333333333357
10 x= 1200 y= 1200 (32) mid=33.0 SD=0.8944271909999159 dev. from mean:1.0
10 x= 1200 y= 1200 (32) mid=33.0 SD=0.8944271909999159 dev. from mean:1.0
10 x= 1200 y= 1200 (34) mid=33.0 SD=0.8944271909999159 dev. from mean:1.0
10 x= 1200 y= 1200 (34) mid=33.0 SD=0.8944271909999159 dev. from mean:1.0
11 x= 1200 y= 1200 (35) mid=36.5 SD=1.0488088481701516 dev. from mean:1.5
11 x= 1200 y= 1200 (38) mid=36.5 SD=1.0488088481701516 dev. from mean:1.5
12 x= 1320 y= 1320 (28) mid=30.166666666666668 SD=1.4719601443879746 dev. from mean:2.166666666666668
12 x= 1320 y= 1320 (32) mid=30.166666666666668 SD=1.4719601443879746 dev. from mean:1.8333333333333321
13 x= 1320 y= 1320 (29) mid=30.333333333333332 SD=1.0327955589886446 dev. from mean:1.3333333333333321
13 x= 1320 y= 1320 (32) mid=30.333333333333332 SD=1.0327955589886446 dev. from mean:1.6666666666666679
14 x= 1380 y= 1380 (38) mid=40.0 SD=1.4142135623730951 dev. from mean:2.0
14 x= 1380 y= 1380 (42) mid=40.0 SD=1.4142135623730951 dev. from mean:2.0
15 x= 1380 y= 1380 (39) mid=41.0 SD=1.4142135623730951 dev. from mean:2.0
15 x= 1380 y= 1380 (43) mid=41.0 SD=1.4142135623730951 dev. from mean:2.0
16 x= 1950 y= 1950 (43) mid=46.666666666666664 SD=2.503331114069145 dev. from mean:3.6666666666666643
16 x= 1950 y= 1950 (50) mid=46.666666666666664 SD=2.503331114069145 dev. from mean:3.3333333333333357
17 x= 1950 y= 1950 (55) mid=53.0 SD=1.4142135623730951 dev. from mean:2.0
17 x= 1950 y= 1950 (51) mid=53.0 SD=1.4142135623730951 dev. from mean:2.0
18 x= 1950 y= 1950 (46) mid=47.833333333333336 SD=1.1690451944500122 dev. from mean:1.8333333333333357
19 x= 2520 y= 2520 (45) mid=46.333333333333336 SD=1.0327955589886444 dev. from mean:1.3333333333333357
19 x= 2520 y= 2520 (48) mid=46.333333333333336 SD=1.0327955589886444 dev. from mean:1.6666666666666643
20 x= 2520 y= 2520 (59) mid=57.0 SD=1.7888543819998317 dev. from mean:2.0
20 x= 2520 y= 2520 (54) mid=57.0 SD=1.7888543819998317 dev. from mean:3.0

21 x= 2520 y= 2520 (59) mid=57.0 SD=1.7888543819998317 dev. from mean:2.0
21 x= 2520 y= 2520 (54) mid=57.0 SD=1.7888543819998317 dev. from mean:3.0
22 x= 3000 y= 3000 (61) mid=64.0 SD=2.3664319132398464 dev. from mean:3.0
22 x= 3000 y= 3000 (67) mid=64.0 SD=2.3664319132398464 dev. from mean:3.0
23 x= 3000 y= 3000 (65) mid=62.333333333333336 SD=2.3380903889000244 dev. from mean:2.6666666666666643
23 x= 3000 y= 3000 (59) mid=62.333333333333336 SD=2.3380903889000244 dev. from mean:3.3333333333333357
24 x= 3000 y= 3000 (62) mid=64.33333333333333 SD=1.7511900715418263 dev. from mean:2.3333333333333286
24 x= 3000 y= 3000 (67) mid=64.33333333333333 SD=1.7511900715418263 dev. from mean:2.6666666666666714
Device 3
1 x= 300 y= 300 (147) mid=148.83333333333334 SD=1.4719601443879746 dev. from mean:1.8333333333333428
1 x= 300 y= 300 (151) mid=148.83333333333334 SD=1.4719601443879746 dev. from mean:2.166666666666657
2 x= 300 y= 300 (112) mid=108.33333333333333 SD=3.559026084010437 dev. from mean:3.6666666666666714
2 x= 300 y= 300 (103) mid=108.33333333333333 SD=3.559026084010437 dev. from mean:5.333333333333329
3 x= 300 y= 300 (98) mid=96.16666666666667 SD=1.4719601443879746 dev. from mean:1.8333333333333286
3 x= 300 y= 300 (94) mid=96.16666666666667 SD=1.4719601443879746 dev. from mean:2.1666666666666714
4 x= 750 y= 750 (396) mid=391.5 SD=3.5071355833500366 dev. from mean:4.5
4 x= 750 y= 750 (387) mid=391.5 SD=3.5071355833500366 dev. from mean:4.5
5 x= 750 y= 750 (325) mid=317.1666666666667 SD=5.269408568963567 dev. from mean:7.833333333333314
5 x= 750 y= 750 (310) mid=317.1666666666667 SD=5.269408568963567 dev. from mean:7.166666666666686
6 x= 900 y= 900 (375) mid=371.5 SD=2.8809720581775866 dev. from mean:3.5
6 x= 900 y= 900 (368) mid=371.5 SD=2.8809720581775866 dev. from mean:3.5
7 x= 900 y= 900 (399) mid=402.8333333333333 SD=2.562550812504343 dev. from mean:3.8333333333333144
7 x= 900 y= 900 (406) mid=402.8333333333333 SD=2.562550812504343 dev. from mean:3.1666666666666856
8 x= 1050 y= 1050 (396) mid=392.1666666666667 SD=2.9268868558020253 dev. from mean:3.8333333333333144
8 x= 1050 y= 1050 (389) mid=392.1666666666667 SD=2.9268868558020253 dev. from mean:3.1666666666666856
9 x= 1050 y= 1050 (460) mid=462.8333333333333 SD=2.48327740429189 dev. from mean:2.8333333333333144
9 x= 1050 y= 1050 (466) mid=462.8333333333333 SD=2.48327740429189 dev. from mean:3.1666666666666856
9 x= 1050 y= 1050 (460) mid=462.8333333333333 SD=2.48327740429189 dev. from mean:2.8333333333333144
10 x= 1200 y= 1200 (340) mid=344.6666666666667 SD=3.6696957185394363 dev. from mean:4.666666666666686
10 x= 1200 y= 1200 (350) mid=344.6666666666667 SD=3.6696957185394363 dev. from mean:5.333333333333314
11 x= 1200 y= 1200 (278) mid=280.5 SD=2.4289915602982237 dev. from mean:2.5

11 x= 1200 y= 1200 (285) mid=280.5 SD=2.4289915602982237 dev. from mean:4.5
12 x= 1320 y= 1320 (448) mid=450.0 SD=1.4142135623730951 dev. from mean:2.0
12 x= 1320 y= 1320 (452) mid=450.0 SD=1.4142135623730951 dev. from mean:2.0
13 x= 1320 y= 1320 (450) mid=443.5 SD=3.7282703764614498 dev. from mean:6.5
13 x= 1320 y= 1320 (439) mid=443.5 SD=3.7282703764614498 dev. from mean:4.5
14 x= 1380 y= 1380 (336) mid=340.0 SD=3.1622776601683795 dev. from mean:4.0
14 x= 1380 y= 1380 (345) mid=340.0 SD=3.1622776601683795 dev. from mean:5.0
15 x= 1380 y= 1380 (310) mid=316.8333333333333 SD=6.6758270399005 dev. from mean:6.833333333333314
15 x= 1380 y= 1380 (309) mid=316.8333333333333 SD=6.6758270399005 dev. from mean:7.833333333333314
15 x= 1380 y= 1380 (326) mid=316.8333333333333 SD=6.6758270399005 dev. from mean:9.166666666666686
16 x= 1950 y= 1950 (296) mid=291.1666666666667 SD=2.6394443859772205 dev. from mean:4.833333333333314
17 x= 1950 y= 1950 (245) mid=249.16666666666666 SD=2.48327740429189 dev. from mean:4.166666666666657
17 x= 1950 y= 1950 (252) mid=249.16666666666666 SD=2.48327740429189 dev. from mean:2.833333333333343
18 x= 1950 y= 1950 (446) mid=449.5 SD=2.4289915602982237 dev. from mean:3.5
18 x= 1950 y= 1950 (453) mid=449.5 SD=2.4289915602982237 dev. from mean:3.5
19 x= 2520 y= 2520 (320) mid=304.1666666666667 SD=11.373946837693003 dev. from mean:15.833333333333314
19 x= 2520 y= 2520 (289) mid=304.1666666666667 SD=11.373946837693003 dev. from mean:15.166666666666686
20 x= 2520 y= 2520 (196) mid=190.16666666666666 SD=3.0605010483034745 dev. from mean:5.833333333333343
20 x= 2520 y= 2520 (187) mid=190.16666666666666 SD=3.0605010483034745 dev. from mean:3.166666666666657
21 x= 2520 y= 2520 (356) mid=352.0 SD=3.5777087639996634 dev. from mean:4.0
21 x= 2520 y= 2520 (347) mid=352.0 SD=3.5777087639996634 dev. from mean:5.0
22 x= 3000 y= 3000 (223) mid=219.66666666666666 SD=2.1602468994692865 dev. from mean:3.333333333333343
22 x= 3000 y= 3000 (217) mid=219.66666666666666 SD=2.1602468994692865 dev. from mean:2.666666666666657
23 x= 3000 y= 3000 (180) mid=197.0 SD=15.786069808536892 dev. from mean:17.0
23 x= 3000 y= 3000 (181) mid=197.0 SD=15.786069808536892 dev. from mean:16.0
23 x= 3000 y= 3000 (223) mid=197.0 SD=15.786069808536892 dev. from mean:26.0
24 x= 3000 y= 3000 (302) mid=299.5 SD=1.8708286933869707 dev. from mean:2.5
24 x= 3000 y= 3000 (297) mid=299.5 SD=1.8708286933869707 dev. from mean:2.5
25 x= 2520 y= 2520 (99) mid=104.0 SD=4.049691346263317 dev. from mean:5.0
25 x= 2520 y= 2520 (110) mid=104.0 SD=4.049691346263317 dev. from mean:6.0
Graphics mix information

```
 Concrete
max in x=2999.9998 y=1140.0,
min in x=1319.9999 y=74.99999,
 Steel
max in x=1050.0 y=29.999998,
min in x=299.99997 y=719.99994,
 Total
max in x=2999.9998 y=1140.0,
min in x=299.99997 y=585.0,
```

Appendices

Appendix I

Stage1

Form1 code

```
' Modified at 23.15 on 04.11.2001
Dim D(5, 100, 50) As Double
Dim xlBook
Dim xlSheet1
Dim xlSheet2
Dim xlSheet3
Dim xlSheet4
Dim xlSheet5
'Dim Koef As Single
Function Picwrite()
If Option1.Value = True Then Matrix = 1
If Option2.Value = True Then Matrix = 2
If Option3.Value = True Then Matrix = 3
If Option4.Value = True Then Matrix = 4
If Option5.Value = True Then Matrix = 5
      Xmax = 0: Ymax = 0
      For Row = 2 To D(Matrix, 0, 0)
      If D(Matrix, Row, 1) > Xmax Then Xmax = D(Matrix, Row, 1)
      If D(Matrix, Row, 2) > Ymax Then Ymax = D(Matrix, Row, 2)
      Next
      'write the size on the screen
      Label3.Caption = "X=" & Xmax
      Label4.Caption = "Y=" & Ymax
' the biggest of them
      If Xmax > Ymax Then
         Big = Xmax
      Else
         Big = Ymax
      End If
' write over the slab
            For X = 1 To (Xmax / Koef) + 3
             Picture1.PSet (X, (Ymax / Koef) + 3), 255
            Next
               For Y = 1 To (Ymax / Koef) + 3
                Picture1.PSet ((Xmax / Koef) + 3, Y), 255
               Next
'All real X,Y points are write on the picture with this coeficient
      For Row = 2 To D(Matrix, 0, 0)
      Picture1.PSet (D(Matrix, Row, 1) / Koef, D(Matrix, Row, 2) / Koef), 0
      Next
End Function

Private Sub Check1_Click()
If Check1.Value = 1 Then

      For Matrix = 1 To 5
            'All real X,Y points are write on the picture with this coeficient
```

```
            For Row = 2 To D(Matrix, 0, 0)
               Picture1.PSet (D(Matrix, Row, 1) / Koef, D(Matrix, Row, 2) / Koef), 0
            Next
      Next
Else
        Command2_Click
        Picwrite


    End If
End Sub

Private Sub Check2_Click()
   If xlBook.Application.Visible = False Then
      xlBook.Application.Visible = True
      xlBook.Windows(1).Visible = True
   Else
      xlBook.Application.Visible = False
      xlBook.Windows(1).Visible = False
   End If
End Sub

Private Sub Command1_Click()
 'The button read file from disk and stored in Memory
   With CommonDialog1
    .DialogTitle = "Choose Text FIle"
    .CancelError = True
     Rem .hWnd = Me.hWnd
      .Flags = OFN_FILEMUSTEXIST Or OFN_PATHMUSTEXIST
      .InitDir = "C:\"
      .Filter = "Excel file (*.XIS)|*.XLS|All Files (*.*)|*.*"
      .FilterIndex = 1
      .ShowOpen

      txtFileName = .FileName
      txtFilter = .Filter

    Rem txtContents = GetFileText(.FileName)
   End With
Label1.Caption = txtFileName
Rem read from excel table
'If Right(txtFileName, 3) = "XLS" Or Right(txtFileName, 3) = "xls" Then
'We have the table as an object here
Set xlBook = GetObject(txtFileName)
Set xlSheet1 = xlBook.Sheets("Shmith-Hamer")
Set xlSheet2 = xlBook.Sheets("Covermeter(C)")
Set xlSheet3 = xlBook.Sheets("Covermeter(S)")
Set xlSheet4 = xlBook.Sheets("Half Cell")
Set xlSheet5 = xlBook.Sheets("Resistivity")

'Text1.Text = xlSheet1.Cells(3, 3)

' Display Microsoft Excel and the Worksheet
' window.
' this will show the Excel if we need
' because it is unchecked at the begining
```

```
'If Check2.Value = 1 Then
'xlBook.Application.Visible = True
'xlBook.Windows(1).Visible = True
'End If
'Initialize the data storage
  For X = 1 To 5: For Y = 1 To 100: For Z = 1 To 50: D(X, Y, Z) = 0: Next: Next: Next

With xlSheet1
    For iRow = 2 To 100
      If .Cells(iRow, 1) = 0 Then D(1, 0, 0) = iRow - 1
      If .Cells(iRow, 1) = 0 Then Exit For
      For iCol = 1 To 50
      If .Cells(iRow, iCol) = 0 Then D(1, iRow, 0) = iCol - 3
       If .Cells(iRow, iCol) = 0 Then Exit For
       D(1, iRow, iCol) = .Cells(iRow, iCol)
       Next
    Next
End With
With xlSheet2
    For iRow = 2 To 100
          If .Cells(iRow, 1) = 0 Then D(2, 0, 0) = iRow - 1
          If .Cells(iRow, 1) = 0 Then Exit For
      For iCol = 1 To 50
         If .Cells(iRow, iCol) = 0 Then D(2, iRow, 0) = iCol - 3
         If .Cells(iRow, iCol) = 0 Then Exit For
         D(2, iRow, iCol) = .Cells(iRow, iCol)
       Next
    Next
End With
With xlSheet3
    For iRow = 2 To 100
          If .Cells(iRow, 1) = 0 Then D(3, 0, 0) = iRow - 1
          If .Cells(iRow, 1) = 0 Then Exit For
      For iCol = 1 To 50
          If .Cells(iRow, iCol) = 0 Then D(3, iRow, 0) = iCol - 3
          If .Cells(iRow, iCol) = 0 Then Exit For
          D(3, iRow, iCol) = .Cells(iRow, iCol)
       Next
    Next
End With
With xlSheet4
    For iRow = 2 To 100
          If .Cells(iRow, 1) = 0 Then D(4, 0, 0) = iRow - 1
          If .Cells(iRow, 1) = 0 Then Exit For
      For iCol = 1 To 50
          If .Cells(iRow, iCol) = 0 Then D(4, iRow, 0) = iCol - 3
          If .Cells(iRow, iCol) = 0 Then Exit For
          D(4, iRow, iCol) = .Cells(iRow, iCol)
       Next
    Next
End With
With xlSheet5
    For iRow = 2 To 100
          If .Cells(iRow, 1) = 0 Then D(5, 0, 0) = iRow - 1
          If .Cells(iRow, 1) = 0 Then Exit For
      For iCol = 1 To 50
```

```
        If .Cells(iRow, iCol) = 0 Then D(5, iRow, 0) = iCol - 3
        If .Cells(iRow, iCol) = 0 Then Exit For
        D(5, iRow, iCol) = .Cells(iRow, iCol)
      Next
    Next
End With

For Mat = 1 To 5
  If D(Mat, 0, 0) = 1 Then 'lipswa pyrwi X,Y na izmerwaneto
      If Mat = 1 Then
            Option1.Enabled = False
            Text1.Enabled = False
            Label9.Caption = " No information for this device."

      End If
      If Mat = 2 Then
            Option2.Enabled = False
            Text2.Enabled = flase
            Label10.Caption = " No information for this device."
       End If
      If Mat = 3 Then
            Option3.Enabled = False
            Text3.Enabled = False
            Label11.Caption = " No information for this device."

       End If
      If Mat = 4 Then
            Option4.Enabled = False
            Text4.Enabled = flase
            Label12.Caption = " No information for this device."

      End If

      If Mat = 5 Then
            Option5.Enabled = False
            Text5.Enabled = False
            Label13.Caption = " No information for this device."

      End If
  End If
Next
' How row .....
' How on row 1 .....
' How on row 2.....
'  """so on
' for global analys on the screen next to the devices
For Device = 1 To 5
'If D(Device, 0, 0) <> 1 Then
            NumberPoints = 0
            Mesurements = 0
            Maxval = -1000000
            Minval = 1000000
            Totalval = 0

        For X = 2 To 100. For Y = 3 To 50:
          If D(Device, X, Y) <> 0 Then
```

```
            Mesurements = Mesurements + 1
            Totalval = Totalval + D(Device, X, Y)
               If D(Device, X, Y) > Maxval Then Maxval = D(Device, X, Y)
               If D(Device, X, Y) < Minval Then Minval = D(Device, X, Y)
            End If
         Next:
          If D(Device, X, 3) <> 0 Then NumberPoints = NumberPoints + 1
         Next

         If Device = 1 And Option1.Enabled = True Then ' ako e otpusheno ustrojstwoto
         Label9.Caption = "All mesurenemt=" & Mesurements & " Number points=" &
NumberPoints & " max=" & Maxval & " min=" & Minval & " mid value=" & Int(Totalval /
Mesurements) & " deviation=" & Int(((Totalval / Mesurements) * 100) / (Maxval - Minval)) & "%"
         Label9.Refresh
         End If

         If Device = 2 And Option2.Enabled = True Then
         Label10.Caption = "All mesurenemt=" & Mesurements & " Number points=" &
NumberPoints & " max=" & Maxval & " min=" & Minval & " mid value=" & Int(Totalval /
Mesurements) & " deviation=" & Int(((Totalval / Mesurements) * 100) / (Maxval - Minval)) & "%"
         Label10.Refresh
         End If

         If Device = 3 And Option3.Enabled = True Then
         Label11.Caption = "All mesurenemt=" & Mesurements & " Number points=" &
NumberPoints & " max=" & Maxval & " min=" & Minval & " mid value=" & Int(Totalval /
Mesurements) & " deviation=" & Int(((Totalval / Mesurements) * 100) / (Maxval - Minval)) & "%"
         Label11.Refresh
         End If

         If Device = 4 And Option4.Enabled = True Then
         Label12.Caption = "All mesurenemt=" & Mesurements & " Number points=" &
NumberPoints & " max=" & Maxval & " min=" & Minval & " mid value=" & Int(Totalval /
Mesurements) & " deviation=" & Int(((Totalval / Mesurements) * 100) / (Maxval - Minval)) & "%"
         Label12.Refresh
         End If

         If Device = 5 And Option5.Enabled = True Then
         Label13.Caption = "All mesurenemt=" & Mesurements & " Number points=" &
NumberPoints & " max=" & Maxval & " min=" & Minval & " mid value=" & Int(Totalval /
Mesurements) & " deviation=" & Int(((Totalval / Mesurements) * 100) / (Maxval - Minval)) & "%"
         Label13.Refresh
         End If
'End If
Next Device

' tuka se opredelia koef na korelacia za chertejite
Xmax = 0: Ymax = 0
      For Matrix = 1 To 5
      'If D(Matrix, 0, 0) <> 1 Then
               For Row = 2 To D(Matrix, 0, 0)
                  If D(Matrix, Row, 1) > Xmax Then Xmax = D(Matrix, Row, 1)
                  If D(Matrix, Row, 2) > Ymax Then Ymax = D(Matrix, Row, 2)
               Next
               'write the size on the screen
                  Label3.Caption = "X=" & Xmax
```

```
                    Label4.Caption = "Y=" & Ymax


                ' the biggest of them
                    If Xmax > Ymax Then
                       Big = Xmax
                    Else
                       Big = Ymax
                    End If

                Koef = Big / 270
        'End If
        Next Matrix

' Now  considering which of the options will be checked because of missing data
  If Option1.Enabled = True Then
     Option1.Value = True

  ElseIf Option2.Enabled = True Then
     Option2.Value = True
  ElseIf Option3.Enabled = True Then
     Option3.Value = True
  ElseIf Option4.Enabled = True Then
     Option4.Value = True
  Else
     Option5.Value = True
  End If
  ' Now  filling the text field with all particular points
Text6.Text = ""
For De = 1 To 5
'If D(De, 0, 0) <> 1 Then
        For R = 2 To D(De, 0, 0)

                    Maxval = -1000000
                    Minval = 1000000
                    Totalval = 0
                    Stringdata = ""
            For C = 3 To D(De, R, 0) + 2
            Stringdata = Stringdata & "; " & D(De, R, C)
               Totalval = Totalval + D(De, R, C)
                  If D(De, R, C) > Maxval Then Maxval = D(De, R, C)
                  If D(De, R, C) < Minval Then Minval = D(De, R, C)
            Next C

               If Maxval <> Minval Then
                    dev = (Totalval / D(De, R, 0)) / (Maxval - Minval)
               Else
                    dev = 0
               End If


        If De = 1 Then Text6.Text = Text6.Text & vbCrLf & (R - 1) & " Shmith-Hammer-" & " X= "
& D(De, R, 1) & " Y=" & D(De, R, 2) & " mes=" & D(De, R, 0) & " max=" & Maxval & " min=" &
Minval & " mid=" & Totalval / D(De, R, 0) & " dev=" & dev & "%" & " data" & Stringdata
```

```
        If De = 2 Then Text6.Text = Text6.Text & vbCrLf & (R - 1) & " Covermeter(C)-" & " X= "
& D(De, R, 1) & " Y=" & D(De, R, 2) & " mes=" & D(De, R, 0) & "max=" & Maxval & " min=" &
Minval & " mid=" & Totalval / D(De, R, 0) & " dev=" & dev & "%" & " data" & Stringdata
        If De = 3 Then Text6.Text = Text6.Text & vbCrLf & (R - 1) & " Covermeter(S)-" & " X= "
& D(De, R, 1) & " Y=" & D(De, R, 2) & " mes=" & D(De, R, 0) & "max=" & Maxval & " min=" &
Minval & " mid=" & Totalval / D(De, R, 0) & " dev=" & dev & "%" & " data" & Stringdata
        If De = 4 Then Text6.Text = Text6.Text & vbCrLf & (R - 1) & " Half Cell-" & " X= " &
D(De, R, 1) & " Y=" & D(De, R, 2) & " mes=" & D(De, R, 0) & "max=" & Maxval & " min=" & Minval
& " mid=" & Totalval / D(De, R, 0) & " dev=" & dev & "%" & " data" & Stringdata
        If De = 5 Then Text6.Text = Text6.Text & vbCrLf & (R - 1) & " Resistivity-" & " X= " &
D(De, R, 1) & " Y=" & D(De, R, 2) & " mes=" & D(De, R, 0) & "max=" & Maxval & " min=" & Minval
& " mid=" & Totalval / D(De, R, 0) & " dev=" & dev & "%" & " data" & Stringdata

      Next R
'End If
Next De
  Picwrite

End Sub

Private Sub Command2_Click()
For X = 0 To 315: For Y = 0 To 274
Picture1.PSet (X, Y), 16777215
Next: Next
Picwrite

End Sub

Private Sub Command4_Click()
      If Option1.Value = True Then Matrix = 1
      If Option2.Value = True Then Matrix = 2
      If Option3.Value = True Then Matrix = 3
      If Option4.Value = True Then Matrix = 4
      If Option5.Value = True Then Matrix = 5
    ' namirane na koef

    Kmin = 100000000: Kmax = -100000000
    For Row = 2 To D(Matrix, 0, 0)
     Total = 0
    For Col = 3 To D(Matrix, Row, 0) + 2
      Total = Total + D(Matrix, Row, Col)
    Next
       Midv = Total / D(Matrix, Row, 0)

       If Kmin > Midv Then Kmin = Midv
       If Kmax < Midv Then Kmax = Midv
    Next

    ValKoef = (Kmax - Kmin) / 255

'Sega polushawame wsiaka stojnost na wsiaka toshka
'opredeliame granicite na slaba
MaxX = 0: MaxY = 0
For Row = 2 To D(Matrix, 0, 0)
  If MaxX < D(Matrix, Row, 1) Then MaxX = D(Matrix, Row, 1)
  If MaxY < D(Matrix, Row, 2) Then MaxY = D(Matrix, Row, 2)
```

```
Next
MaxX = Int(MaxX / Koef)
MaxY = Int(MaxY / Koef)

 For X = 1 To MaxX + 5: For Y = 1 To MaxY + 5
        XClick = Int(X * Koef)
        YClick = Int(Y * Koef)

        ' namirane na 3 te naj-blozki toshki

        Dim Dist(3) As Single
        Dim PX(3), PY(3) As Integer
        For S = 1 To 3: PX(S) = 0: PY(S) = 0: Next
       Dist(3) = 300000
       Dist(2) = 300000
       Dist(1) = 300000

        For Max = 1 To 3:
        For Row = 2 To D(Matrix, 0, 0)
              Xi = D(Matrix, Row, 1)
              Yi = D(Matrix, Row, 2)
                   AA = ((XClick - Xi) ^ 2) + ((YClick - Yi) ^ 2)

             If Max = 1 Then
                   If Dist(Max) > (AA ^ 0.5) Then
                        Dist(Max) = (AA ^ 0.5)
                      PX(Max) = Xi: PY(Max) = Yi
                   End If
              End If

              If Max = 2 Then
                   If Dist(Max) > (AA ^ 0.5) And (PX(1) <> Xi Or PY(1) <> Yi) Then
                        Dist(Max) = (AA ^ 0.5)
                      PX(Max) = Xi: PY(Max) = Yi
                   End If
             End If
             If Max = 3 Then
                   If Dist(Max) > (AA ^ 0.5) And (PX(1) <> Xi Or PY(1) <> Yi) And (PX(2) <> Xi Or
PY(2) <> Yi) Then
                        Dist(Max) = (AA ^ 0.5)
                      PX(Max) = Xi: PY(Max) = Yi
                   End If
             End If

        Next:
        Next:

      Dim Mvalue(3) As Double


          For S = 1 To 3
             'point middle value
            For Row = 2 To D(Matrix, 0, 0)
              If PX(S) = D(Matrix, Row, 1) And PY(S) = D(Matrix, Row, 2) Then
                 Total = 0
                    For Col = 3 To D(Matrix, Row, 0)
```

```
                        Total = Total + D(Matrix, Row, Col)
                    Next
                Mvalue(S) = Total / (D(Matrix, Row, 0) - 1)
            End If
        Next
    Next
' tuka triabwa toshakata da se otpeshata na ekrana
If Check3.Value = 0 Then
   UnitPointSt = (Abs(Mvalue(1)) - Abs(Mvalue(2))) / (Dist(1) + Dist(2))
   If Mvalue(1) > Mvalue(2) Then
       PointSt = Mvalue(1) - Dist(1) * UnitPointSt
   Else
       PointSt = Mvalue(1) + Dist(1) * UnitPointSt
   End If

Else
      UnitPointSt = (Abs(Mvalue(1)) - Abs(Mvalue(2))) / (Dist(1) + Dist(2))
      UnitPointSt1 = (Abs(Mvalue(1)) - Abs(Mvalue(3))) / (Dist(1) + Dist(3))
      UnitPointSt2 = (Abs(Mvalue(2)) - Abs(Mvalue(3))) / (Dist(2) + Dist(3))

      If Mvalue(1) > Mvalue(2) Then
          PointSt = Mvalue(1) - Dist(1) * UnitPointSt
      Else
          PointSt = Mvalue(1) + Dist(1) * UnitPointSt
      End If

      If Mvalue(1) > Mvalue(3) Then
          PointSt1 = Mvalue(1) - Dist(1) * UnitPointSt1
      Else
          PointSt1 = Mvalue(1) + Dist(1) * UnitPointSt1
      End If
      If Mvalue(2) > Mvalue(3) Then
          PointSt2 = Mvalue(2) - Dist(2) * UnitPointSt2
      Else
          PointSt2 = Mvalue(2) + Dist(2) * UnitPointSt2
      End If

      PointSt = (PointSt + PointSt1 + PointSt2) / 2.5
' sega triabwa stojnostta da se normalizira i da se otpeshata
End If


 Picture1.PSet (X, Y), RGB(Abs((PointSt - Kmin) / ValKoef), 0, 0)

   Next: Next
End Sub
Private Sub Command5_Click()
W(1) = Text1.Text
W(2) = Text2.Text
W(3) = Text3.Text
W(4) = Text4.Text
W(5) = Text5.Text

      For X = 1 To 270: For Y = 1 To 270
         Slab(1, X, Y) = 0
         Slab(2, X, Y) = 0
```

```
        Slab(3, X, Y) = 0
        Slab(4, X, Y) = 0
        Slab(5, X, Y) = 0
    Next: Next

For Matrix = 1 To 5
'If D(Matrix, 0, 0) <> 1 Then
      Kmin = 1000000:
      Kmax = -1000000
      For Row = 2 To D(Matrix, 0, 0)
       Total = 0
      For Col = 3 To D(Matrix, Row, 0) + 2
        Total = Total + D(Matrix, Row, Col)
      Next
         Midv = Total / D(Matrix, Row, 0)
         If Kmin > Midv Then Kmin = Midv
         If Kmax < Midv Then Kmax = Midv
      Next

      ValKoef = (Kmax - Kmin) / 255

      'Sega polushawame wsiaka stojnost na wsiaka toshka
  'opredeliame granicite na slaba
  MaxX = 0: MaxY = 0
  For Row = 2 To D(Matrix, 0, 0)
    If MaxX < D(Matrix, Row, 1) Then MaxX = D(Matrix, Row, 1)
    If MaxY < D(Matrix, Row, 2) Then MaxY = D(Matrix, Row, 2)
  Next
  MaxX = Int(MaxX / Koef)
  MaxY = Int(MaxY / Koef)

   For X = 1 To MaxX: For Y = 1 To MaxY
        XClick = Int(X * Koef)
        YClick = Int(Y * Koef)

        ' namirane na 3 te naj-blozki toshki

        Dim Dist(3) As Single
        Dim PX(3), PY(3) As Integer
        For S = 1 To 3: PX(S) = 0: PY(S) = 0: Next
       Dist(3) = 300000
       Dist(2) = 300000
       Dist(1) = 300000

        For Max = 1 To 3:
        For Row = 2 To D(Matrix, 0, 0)
            Xi = D(Matrix, Row, 1)
            Yi = D(Matrix, Row, 2)
                AA = ((XClick - Xi) ^ 2) + ((YClick - Yi) ^ 2)

           If Max = 1 Then
                If Dist(Max) > (AA ^ 0.5) Then
                    Dist(Max) = (AA ^ 0.5)
                  PX(Max) = Xi: PY(Max) = Yi
                End If
            End If
```

```
                If Max = 2 Then
                    If Dist(Max) > (AA ^ 0.5) And (PX(1) <> Xi Or PY(1) <> Yi) Then
                        Dist(Max) = (AA ^ 0.5)
                        PX(Max) = Xi: PY(Max) = Yi
                    End If
                End If
                If Max = 3 Then
                    If Dist(Max) > (AA ^ 0.5) And (PX(1) <> Xi Or PY(1) <> Yi) And (PX(2) <> Xi
Or PY(2) <> Yi) Then
                        Dist(Max) = (AA ^ 0.5)
                        PX(Max) = Xi: PY(Max) = Yi
                    End If
                End If

            Next:
            Next:

        Dim Mvalue(3) As Double


            For S = 1 To 3
                'point middle value
                For Row = 2 To D(Matrix, 0, 0)
                  If PX(S) = D(Matrix, Row, 1) And PY(S) = D(Matrix, Row, 2) Then
                    Total = 0
                        For Col = 3 To D(Matrix, Row, 0)
                            Total = Total + D(Matrix, Row, Col)
                        Next
                    Mvalue(S) = Total / (D(Matrix, Row, 0) - 1)
                  End If
                Next
            Next
  ' tuka triabwa toshakata da se otpeshata na ekrana
 If Check3.Value = 0 Then
     UnitPointSt = (Abs(Mvalue(1)) - Abs(Mvalue(2))) / (Dist(1) + Dist(2))
     If Mvalue(1) > Mvalue(2) Then
         PointSt = Mvalue(1) - Dist(1) * UnitPointSt
     Else
         PointSt = Mvalue(1) + Dist(1) * UnitPointSt
     End If
 Else

    UnitPointSt = (Abs(Mvalue(1)) - Abs(Mvalue(2))) / (Dist(1) + Dist(2))
     UnitPointSt1 = (Abs(Mvalue(1)) - Abs(Mvalue(3))) / (Dist(1) + Dist(3))
     UnitPointSt2 = (Abs(Mvalue(2)) - Abs(Mvalue(3))) / (Dist(2) + Dist(3))

     If Mvalue(1) > Mvalue(2) Then
         PointSt = Mvalue(1) - Dist(1) * UnitPointSt
     Else
         PointSt = Mvalue(1) + Dist(1) * UnitPointSt
     End If

     If Mvalue(1) > Mvalue(3) Then
         PointSt1 = Mvalue(1) - Dist(1) * UnitPointSt1
     Else
```

```
            PointSt1 = Mvalue(1) + Dist(1) * UnitPointSt1
        End If
        If Mvalue(2) > Mvalue(3) Then
            PointSt2 = Mvalue(2) - Dist(2) * UnitPointSt2
        Else
            PointSt2 = Mvalue(2) + Dist(2) * UnitPointSt2
        End If

        PointSt = (PointSt + PointSt1 + PointSt2) / 2.5
    End If
      ' sega triabwa stojnostta da se normalizira i da se otpeshata

      'Picture1.PSet (X, Y), RGB(Abs((PointSt - Kmin) / ValKoef), 0, 0)
      Slab(Matrix, X, Y) = Abs((PointSt - Kmin) / ValKoef)
        Next: Next

    'End If
    Next Matrix

Form2.Show
End Sub

Private Sub Command6_Click()
          'real point
          XClick = Text8.Text
          YClick = Text9.Text


' systoto kato Mouse_down
' samo toshkite se wzimat ot Text8 i text 9
If Check1.Value = 1 Then
          MsgBox ("You can't provide info in All devices checked mode")
Else

          If Option1.Value = True Then Matrix = 1
          If Option2.Value = True Then Matrix = 2
          If Option3.Value = True Then Matrix = 3
          If Option4.Value = True Then Matrix = 4
          If Option5.Value = True Then Matrix = 5
          If Option1.Value = True Then M = "Shmith_Hamer"
          If Option2.Value = True Then M = "Covermeter(C)"
          If Option3.Value = True Then M = "Covermeter(S)"
          If Option4.Value = True Then M = "Half Cell"
          If Option5.Value = True Then M = "Resistivity"

          Text7.Text = "Click is over point for " & M & " is X=" & XClick & " Y=" & YClick
          Text7.Text = Text7.Text & vbCrLf

          ' namirane na 3 te naj-blozki toshki

          Dim Dist(3) As Single
          Dim PX(3), PY(3) As Integer
          For S = 1 To 3: PX(S) = 0: PY(S) = 0: Next
         Dist(3) = 300000
         Dist(2) = 300000
         Dist(1) = 300000
```

```
        For Max = 1 To 3:
        For Row = 2 To D(Matrix, 0, 0)
              Xi = D(Matrix, Row, 1)
              Yi = D(Matrix, Row, 2)
                   AA = ((XClick - Xi) ^ 2) + ((YClick - Yi) ^ 2)

             If Max = 1 Then
                   If Dist(Max) > (AA ^ 0.5) Then
                        Dist(Max) = (AA ^ 0.5)
                      PX(Max) = Xi: PY(Max) = Yi
                   End If
              End If

              If Max = 2 Then
                   If Dist(Max) > (AA ^ 0.5) And (PX(1) <> Xi Or PY(1) <> Yi) Then
                        Dist(Max) = (AA ^ 0.5)
                      PX(Max) = Xi: PY(Max) = Yi
                   End If
             End If
             If Max = 3 Then
                   If Dist(Max) > (AA ^ 0.5) And (PX(1) <> Xi Or PY(1) <> Yi) And (PX(2) <> Xi Or
PY(2) <> Yi) Then
                        Dist(Max) = (AA ^ 0.5)
                      PX(Max) = Xi: PY(Max) = Yi
                   End If
             End If

        Next:
        Next:
    Text7.Text = Text7.Text & " The system found 3 closest points are:"

          For S = 1 To 3
             Text7.Text = Text7.Text & vbCrLf & "===========" & vbCrLf
             Text7.Text = Text7.Text & "point " & S & vbCrLf
             Text7.Text = Text7.Text & " X=" & PX(S)
             Text7.Text = Text7.Text & " Y=" & PY(S) & vbCrLf
             Text7.Text = Text7.Text & " Distance= " & Dist(S)
              'point middle value
             For Row = 2 To D(Matrix, 0, 0)
               If PX(S) = D(Matrix, Row, 1) And PY(S) = D(Matrix, Row, 2) Then
                  Total = 0
                     For Col = 3 To D(Matrix, Row, 0)
                        Total = Total + D(Matrix, Row, Col)
                     Next
                  Mval = Total / (D(Matrix, Row, 0) - 1)
               End If
             Next
             Text7.Text = Text7.Text & vbCrLf & "mid.val=" & Mval & vbCrLf
             ' now for probabilistic value
             ' found max and min
             Max = -1000000: Min = 1000000
             For Row = 2 To D(Matrix, 0, 0)
               If PX(S) = D(Matrix, Row, 1) And PY(S) = D(Matrix, Row, 2) Then
                     For Col = 3 To D(Matrix, Row, 0)
                        If Max < D(Matrix, Row, Col) Then Max = D(Matrix, Row, Col)
```

```
                    If Min > D(Matrix, Row, Col) Then Min = D(Matrix, Row, Col)
                Next
              End If
            Next
            'polushawame 5-te zoni
            UNitZones = (Max - Min) / 5
            MInZone1 = Min: MaxZone1 = Min + UNitZones
            MInZone2 = Min + 1 * UNitZones: MaxZone2 = Min + 2 * UNitZones
            MInZone3 = Min + 2 * UNitZones: MaxZone3 = Min + 3 * UNitZones
            MInZone4 = Min + 3 * UNitZones: MaxZone4 = Min + 4 * UNitZones
            MInZone5 = Min + 4 * UNitZones: MaxZone5 = Min + 5 * UNitZones
            ' opredeliame w koja zona sa dannite
            Zone1 = 0: Zone2 = 0: Zone3 = 0: Zone4 = 0: Zone5 = 0
            For Row = 2 To D(Matrix, 0, 0)
              If PX(S) = D(Matrix, Row, 1) And PY(S) = D(Matrix, Row, 2) Then
                  For Col = 3 To D(Matrix, Row, 0)
                    If D(Matrix, Row, Col) >= MInZone1 And D(Matrix, Row, Col) <=
MaxZone1 Then Zone1 = Zone1 + 1
                    If D(Matrix, Row, Col) >= MInZone2 And D(Matrix, Row, Col) <=
MaxZone2 Then Zone2 = Zone2 + 2
                    If D(Matrix, Row, Col) >= MInZone3 And D(Matrix, Row, Col) <=
MaxZone3 Then Zone3 = Zone3 + 3
                    If D(Matrix, Row, Col) >= MInZone4 And D(Matrix, Row, Col) <=
MaxZone4 Then Zone4 = Zone4 + 4
                    If D(Matrix, Row, Col) >= MInZone5 And D(Matrix, Row, Col) <=
MaxZone5 Then Zone5 = Zone5 + 5

                  Next
              End If
            Next
            Text7.Text = Text7.Text & vbCrLf
            Text7.Text = Text7.Text & " probabilistic distribution in 5 zones" & vbCrLf
            Text7.Text = Text7.Text & " Zone1=(" & MInZone1 & " - " & MaxZone1 & ")=" &
(Zone1 / (Zone1 + Zone2 + Zone3 + Zone4 + Zone5)) * 100 & "%" & vbCrLf
            Text7.Text = Text7.Text & " Zone2=(" & MInZone2 & " - " & MaxZone2 & ")=" &
(Zone2 / (Zone1 + Zone2 + Zone3 + Zone4 + Zone5)) * 100 & "%" & vbCrLf
            Text7.Text = Text7.Text & " Zone3=(" & MInZone3 & " - " & MaxZone3 & ")=" &
(Zone3 / (Zone1 + Zone2 + Zone3 + Zone4 + Zone5)) * 100 & "%" & vbCrLf
            Text7.Text = Text7.Text & " Zone4=(" & MInZone4 & " - " & MaxZone4 & ")=" &
(Zone4 / (Zone1 + Zone2 + Zone3 + Zone4 + Zone5)) * 100 & "%" & vbCrLf
            Text7.Text = Text7.Text & " Zone5=(" & MInZone5 & " - " & MaxZone5 & ")=" &
(Zone5 / (Zone1 + Zone2 + Zone3 + Zone4 + Zone5)) * 100 & "%" & vbCrLf
        Next
    End If

End Sub

Private Sub Form_Load()
End Sub
Private Sub Option1_Click()
Picwrite
End Sub
Private Sub Option2_Click()
Picwrite
End Sub
Private Sub Option3_Click()
```

```
Picwrite
End Sub
Private Sub Option4_Click()
Picwrite
End Sub
Private Sub Option5_Click()
Picwrite
End Sub

Private Sub Picture1_MouseDown(Button As Integer, Shift As Integer, X As Single, Y As Single)
If Check1.Value = 1 Then
        MsgBox ("You can't provide info in All devices checked mode")
Else

        If Option1.Value = True Then Matrix = 1
        If Option2.Value = True Then Matrix = 2
        If Option3.Value = True Then Matrix = 3
        If Option4.Value = True Then Matrix = 4
        If Option5.Value = True Then Matrix = 5
        If Option1.Value = True Then M = "Shmith_Hamer"
        If Option2.Value = True Then M = "Covermeter(C)"
        If Option3.Value = True Then M = "Covermeter(S)"
        If Option4.Value = True Then M = "Half Cell"
        If Option5.Value = True Then M = "Resistivity"

        Text7.Text = "Click is over point for " & M & " is X=" & Int(X * Koef) & " Y=" & Int(Y * Koef)
        Text7.Text = Text7.Text & vbCrLf
        'real point
        XClick = Int(X * Koef)
        YClick = Int(Y * Koef)

        ' namirane na 3 te naj-blozki toshki

        Dim Dist(3) As Single
        Dim PX(3), PY(3) As Integer
        For S = 1 To 3: PX(S) = 0: PY(S) = 0: Next
       Dist(3) = 300000
       Dist(2) = 300000
       Dist(1) = 300000

        For Max = 1 To 3:
        For Row = 2 To D(Matrix, 0, 0)
              Xi = D(Matrix, Row, 1)
              Yi = D(Matrix, Row, 2)
                   AA = ((XClick - Xi) ^ 2) + ((YClick - Yi) ^ 2)

             If Max = 1 Then
                   If Dist(Max) > (AA ^ 0.5) Then
                        Dist(Max) = (AA ^ 0.5)
                      PX(Max) = Xi: PY(Max) = Yi
                   End If
              End If

              If Max = 2 Then
                   If Dist(Max) > (AA ^ 0.5) And (PX(1) <> Xi Or PY(1) <> Yi) Then
                        Dist(Max) = (AA ^ 0.5)
```

```
                    PX(Max) = Xi: PY(Max) = Yi
                End If
            End If
            If Max = 3 Then
                If Dist(Max) > (AA ^ 0.5) And (PX(1) <> Xi Or PY(1) <> Yi) And (PX(2) <> Xi Or
PY(2) <> Yi) Then
                    Dist(Max) = (AA ^ 0.5)
                    PX(Max) = Xi: PY(Max) = Yi
                End If
            End If

        Next:
        Next:
    Text7.Text = Text7.Text & " The system found 3 closest points are:"

        For S = 1 To 3
            Text7.Text = Text7.Text & vbCrLf & "==========" & vbCrLf
            Text7.Text = Text7.Text & "point " & S & vbCrLf
            Text7.Text = Text7.Text & " X=" & PX(S)
            Text7.Text = Text7.Text & " Y=" & PY(S) & vbCrLf
            Text7.Text = Text7.Text & " Distance= " & Dist(S)
             'point middle value
            For Row = 2 To D(Matrix, 0, 0)
              If PX(S) = D(Matrix, Row, 1) And PY(S) = D(Matrix, Row, 2) Then
                Total = 0
                    For Col = 3 To D(Matrix, Row, 0)
                        Total = Total + D(Matrix, Row, Col)
                    Next
                Mval = Total / (D(Matrix, Row, 0) - 1)
              End If
            Next
            Text7.Text = Text7.Text & vbCrLf & "mid.val=" & Mval & vbCrLf
            ' now for probabilistic value
            ' found max and min
            Max = -1000000: Min = 1000000
            For Row = 2 To D(Matrix, 0, 0)
              If PX(S) = D(Matrix, Row, 1) And PY(S) = D(Matrix, Row, 2) Then
                    For Col = 3 To D(Matrix, Row, 0)
                        If Max < D(Matrix, Row, Col) Then Max = D(Matrix, Row, Col)
                        If Min > D(Matrix, Row, Col) Then Min = D(Matrix, Row, Col)
                    Next
              End If
            Next
            'polushawame 5-te zoni
            UNitZones = (Max - Min) / 5
            MInZone1 = Min: MaxZone1 = Min + UNitZones
            MInZone2 = Min + 1 * UNitZones: MaxZone2 = Min + 2 * UNitZones
            MInZone3 = Min + 2 * UNitZones: MaxZone3 = Min + 3 * UNitZones
            MInZone4 = Min + 3 * UNitZones: MaxZone4 = Min + 4 * UNitZones
            MInZone5 = Min + 4 * UNitZones: MaxZone5 = Min + 5 * UNitZones
            ' opredeliame w koja zona sa dannite
            Zone1 = 0: Zone2 = 0: Zone3 = 0: Zone4 = 0: Zone5 = 0
            For Row = 2 To D(Matrix, 0, 0)
              If PX(S) = D(Matrix, Row, 1) And PY(S) = D(Matrix, Row, 2) Then
                    For Col = 3 To D(Matrix, Row, 0)
```

```
                    If D(Matrix, Row, Col) >= MInZone1 And D(Matrix, Row, Col) <=
MaxZone1 Then Zone1 = Zone1 + 1
                    If D(Matrix, Row, Col) >= MInZone2 And D(Matrix, Row, Col) <=
MaxZone2 Then Zone2 = Zone2 + 2
                    If D(Matrix, Row, Col) >= MInZone3 And D(Matrix, Row, Col) <=
MaxZone3 Then Zone3 = Zone3 + 3
                    If D(Matrix, Row, Col) >= MInZone4 And D(Matrix, Row, Col) <=
MaxZone4 Then Zone4 = Zone4 + 4
                    If D(Matrix, Row, Col) >= MInZone5 And D(Matrix, Row, Col) <=
MaxZone5 Then Zone5 = Zone5 + 5

                  Next
              End If
             Next
            Text7.Text = Text7.Text & vbCrLf
            Text7.Text = Text7.Text & " probabilistic distribution in 5 zones" & vbCrLf
            Text7.Text = Text7.Text & " Zone1=(" & MInZone1 & " - " & MaxZone1 & ")=" &
(Zone1 / (Zone1 + Zone2 + Zone3 + Zone4 + Zone5)) * 100 & "%" & vbCrLf
            Text7.Text = Text7.Text & " Zone2=(" & MInZone2 & " - " & MaxZone2 & ")=" &
(Zone2 / (Zone1 + Zone2 + Zone3 + Zone4 + Zone5)) * 100 & "%" & vbCrLf
            Text7.Text = Text7.Text & " Zone3=(" & MInZone3 & " - " & MaxZone3 & ")=" &
(Zone3 / (Zone1 + Zone2 + Zone3 + Zone4 + Zone5)) * 100 & "%" & vbCrLf
            Text7.Text = Text7.Text & " Zone4=(" & MInZone4 & " - " & MaxZone4 & ")=" &
(Zone4 / (Zone1 + Zone2 + Zone3 + Zone4 + Zone5)) * 100 & "%" & vbCrLf
            Text7.Text = Text7.Text & " Zone5=(" & MInZone5 & " - " & MaxZone5 & ")=" &
(Zone5 / (Zone1 + Zone2 + Zone3 + Zone4 + Zone5)) * 100 & "%" & vbCrLf
        Next
   End If
End Sub
Stage1 Form2 code
Dim C(270, 270) As Double
Dim S(270, 270) As Double
Private Sub Command1_Click()
   Text1.Text = " INPUT file." & Form1.Label1.Caption & vbCrLf
   Text1.Text = Text1.Text & " Shmith-Hamer- weigh:" & Form1.Text1.Text & vbCrLf
   Text1.Text = Text1.Text & " data:" & Form1.Label9.Caption & vbCrLf
   Text1.Text = Text1.Text & " Covermeter(C)-weigh:" & Form1.Text2.Text & vbCrLf
   Text1.Text = Text1.Text & " data:" & Form1.Label10.Caption & vbCrLf
   Text1.Text = Text1.Text & " Covermeter(S)-weigh:" & Form1.Text3.Text & vbCrLf
   Text1.Text = Text1.Text & " data:" & Form1.Label11.Caption & vbCrLf
   Text1.Text = Text1.Text & " Half Cell - weigh:" & Form1.Text4.Text & vbCrLf
   Text1.Text = Text1.Text & " data:" & Form1.Label12.Caption & vbCrLf
   Text1.Text = Text1.Text & " Resistivity-weigh:" & Form1.Text5.Text & vbCrLf
   Text1.Text = Text1.Text & " data:" & Form1.Label13.Caption & vbCrLf
   Text1.Text = Text1.Text & " POINTS" & vbCrLf
   Text1.Text = Text1.Text & Form1.Text6.Text
End Sub
Private Sub Command3_Click()
On Error GoTo Problemfile

    FileName = "Report.txt"
    F = FreeFile
    Open FileName For Output As #F

        Print #F, Text1.Text
```

```
        Close #F

        SavePicture Picture1.Image, "Concret.bmp"
        SavePicture Picture2.Image, "Steel.bmp"
        SavePicture Picture3.Image, "Total.bmp"
        Exit Sub
Problemfile:
   MsgBox ("Has problem to save data in file")
End Sub
Private Sub Form_Load()
'Form1.Hide
For Matrix = 1 To 5: For X = 1 To 270: For Y = 1 To 270
    Slab(Matrix, X, Y) = Slab(Matrix, X, Y) * W(Matrix)
Next: Next: Next
' Sega se grupirat po 2-ki
For X = 1 To 270: For Y = 1 To 270
   S(X, Y) = Slab(1, X, Y) + Slab(2, X, Y)
   C(X, Y) = Slab(3, X, Y) + Slab(4, X, Y) + Slab(5, X, Y)
Next: Next
'normalizacia
MaxS = -1000000: MinS = 1000000
MaxC = -1000000: MinC = 1000000
For X = 1 To 270: For Y = 1 To 270
  If MaxS < S(X, Y) Then MaxS = S(X, Y)
  If MinS > S(X, Y) Then MinS = S(X, Y)
  If MaxC < C(X, Y) Then MaxC = C(X, Y)
  If MinC > C(X, Y) Then MinC = C(X, Y)
Next: Next
KS = MaxS / 255
KC = MaxC / 255
'izpiswane
For X = 1 To 270: For Y = 1 To 270
 Picture1.PSet (X, Y), RGB(S(X, Y) / KS, 0, 0)
 Picture2.PSet (X, Y), RGB(C(X, Y) / KC, 0, 0)
 Picture3.PSet (X, Y), RGB(((S(X, Y) / KS) + (C(X, Y) / KC)) / 2, 0, 0)
Next: Next
End Sub
Private Sub Picture1_MouseDown(Button As Integer, Shift As Integer, X As Single, Y As Single)
XClick = X * Koef
YClick = Y * Koef
Text2.Text = "Clicked point X=" & XClick & " Y=" & YClick & vbCrLf
Text2.Text = Text2.Text & "total data=" & S(XClick, YClick) & vbCrLf & " Original data Chmith
Hamer:" & Slab(1, X, Y) & " Covermeter(C)" & Slab(2, X, Y)
End Sub
Private Sub Picture2_MouseDown(Button As Integer, Shift As Integer, X As Single, Y As Single)
XClick = X * Koef
YClick = Y * Koef
Text2.Text = "Clicked point X=" & XClick & " Y=" & YClick & vbCrLf
Text2.Text = Text2.Text & "total data=" & C(XClick, YClick) & vbCrLf & " Original data
Covermeter(S):" & Slab(3, X, Y) & " Half Cell" & Slab(4, X, Y) & " Resistivity" & Slab(5, X, Y)
End Sub

Private Sub Picture3_MouseDown(Button As Integer, Shift As Integer, X As Single, Y As Single)
XClick = X * Koef
YClick = Y * Koef
Text2.Text = "Clicked point X=" & XClick & " Y=" & YClick & vbCrLf
```

End Sub
Stage1 Module1 code
Public Slab(5, 270, 270) As Double
Public W(5) As Single
Public Koef As Single

==========

Appendix II

Stage 2

Application 1

```
package ziad;
import java.awt.*;
import javax.swing.*;
public class Application1 {
  boolean packFrame = false;
  //Construct the application
  public Application1() {
    Frame1 frame = new Frame1();
    //Validate frames that have preset sizes
    //Pack frames that have useful preferred size info, e.g. from their layout
    if (packFrame) {
      frame.pack();
    }
    else {
      frame.validate();
    }
    //Center the window
    Dimension screenSize = Toolkit.getDefaultToolkit().getScreenSize();
    Dimension frameSize = frame.getSize();
    if (frameSize.height > screenSize.height) {
      frameSize.height = screenSize.height;
    }
    if (frameSize.width > screenSize.width) {
      frameSize.width = screenSize.width;
    }
    frame.setLocation((screenSize.width - frameSize.width) / 2, (screenSize.height -
frameSize.height) / 2);
    frame.setVisible(true);
    try {
      jbInit();
    }
    catch(Exception e) {
      e.printStackTrace();
    }
  }
  //Main method
  public static void main(String[] args) {
    try {
      UIManager.setLookAndFeel(UIManager.getSystemLookAndFeelClassName());
          }
    catch(Exception e) {
      e.printStackTrace();
```

```
    }
    new Application1();
  }
  private void jbInit() throws Exception {
  }
}
```

==========

Frame 1 Code

```
package ziad;
// including some packages and java classes
import  java.io.*;
import java.awt.*;
import java.awt.event.*;
import javax.swing.*;
import com.borland.jbcl.layout.*;
import javax.swing.event.*;
import java.awt.geom.*;
import java.awt.Graphics2D.*;
import java.lang.*;
// this is the main class Frame of the program
public class Frame1 extends JFrame {// general calss frame1
public Frame2 MyFrame = new Frame2();// this is the help windows
public int Raster;
public int General_sw=0;
public double [][][] dev_graph = new double [6][201][201];// keep the view sline informatin
public  double [][] graph = new double [201][201];// keep the spline in Analyse panel
        double [] dist = new double [4];// distance to 4 closest points
        int [] PX = new int [4];// coordinates of 4 points
        int [] PY = new int [4];
  JPanel contentPane;
  XYLayout xYLayout1 = new XYLayout();
  JTabbedPane jTabbedPane1 = new JTabbedPane();
  JPanel jPanel1 = new JPanel();
  XYLayout xYLayout2 = new XYLayout();
  JPanel jPanel2 = new JPanel();
  JPanel jPanel3 = new JPanel();
  JPanel jPanel4 = new JPanel();
  JPanel jPanel5 = new JPanel();
  JPanel jPanel6 = new JPanel();
  JPanel jPanel7 = new JPanel();
 MyPanel jPanel10= new MyPanel();
                int [][] MaxMin = new int[4][2];// keep the max and min values
                double Zone1,Zone2,Zone3,Zone4,Zone5,Sum;
                double border1,border2,border3,border4,border5,border6;
  XYLayout xYLayout9 = new XYLayout();
 JFileChooser jFileChooser1 = new JFileChooser();// this is chooser for EXP file
  JLabel jLabel1_general_info = new JLabel();
  JButton jButton1 = new JButton();
  XYLayout xYLayout3 = new XYLayout();
  XYLayout xYLayout4 = new XYLayout();
  XYLayout xYLayout6 = new XYLayout();
  XYLayout xYLayout7 = new XYLayout();
```

```
  XYLayout xYLayout8 = new XYLayout();
  JButton jButton2 = new JButton();
  JLabel jLabel1 = new JLabel();
  JTextField jTextField1 = new JTextField();
  JScrollPane jScrollPane1 = new JScrollPane();
  JTextArea jTextArea1 = new JTextArea();
  JLabel jLabel2 = new JLabel();
  JPanel jPanel8 = new JPanel();
  JPanel jPanel9 = new JPanel();
  JScrollPane jScrollPane2 = new JScrollPane();
////////////////////////////////////////////////////////////////////////
// add the real data model
  String [][] data = new String [20][3];//20 groups, 2 levels + 1 conclusion
  JButton[] JButt = new JButton[20];// first level buttons
  JButton[] JButt1= new JButton[20];// second level buttons
   int Count_row; String line ; String pice;// track dynamically the buttons
   float weight2,weight3,weight4,weight5,weight6;// weight koefficient for the devices
   String sub;
  //controlsers
  public int Counter,y,Count,poz;//count the position into the groups
  public String recomendation, filename, filename1;
// end model controler
   public int Iterations=0;
// the data from measurements
public int[][][] d = new int[5][100][50];// real data from the file
// 5 devices 100 rows and 50 data per row is MAX
 public int mark;
 public float mastab_all_devices;// coefficient to shift the all devices to 200 points
 String o;
 ////////// for forming the mastab
public  float mastab;// coefficient to shift the device to 200 points
////////////////////////////////////////////////////////////////////////
public double[] value_pos = new double[3]; // value and position of the estimated point
public double[][] points4 = new double[4][3], // 4 points after calculation.
public double [] Mvalue = new double [4];//Midle value of each of the 4 points
// this is the general calss for all active buttons
class ButtListener implements ActionListener {// this listen dynamically the buttons
   public void actionPerformed(ActionEvent e) {
//System.out.print("bl is activated\n");
  JButton JB= (JButton)e.getSource();// take the active button
     //this is check for buttons pressed
    int level=0;// control the level of Listener as switch first row or second row
    // we have to know in case to output the result into the final panel (Text filed)
    for (int x=0;x<Counter;x++){
          // if the button is from row 0 means Caluculate row 1
          if (JB.getText()== data[x][0]){// data keep the information from EXP file // level 0
                java.util.StringTokenizer st= new java.util.StringTokenizer(data[x][1],",");// level1[1]
                level=1; // switch the level
                Count = x;// memorise the data place
               jPanel9.removeAll();// remove all buttons from the submenu of the buttons
                ButtListener bl= new ButtListener();
                        y= 0;
                        while(st.hasMoreTokens()){// pass via all st
                       // Checker should appear only in Secon passs of this module
                             JButt1[y]= new JButton(st.nextToken());
                             JButt1[y].addActionListener(bl);
```

```
                        jPanel9.add(JButt1[y]);
                        y++;
                    //  jPanel9.invalidate();
                       jPanel9.repaint();
                       jPanel3 repaint();
                       jPanel3.validate();
                        // System.out.println(st.nextToken());// work perfect
                    }//while
          }// if
      }//for
if (level==0){// this variable control the level
     //System.out.print("butona e na pozicia Count= "+Count+" ");
     //System.out.print("imeto e " + JB.getText()+"\n");
     // show me the prescription from row 3
     // find the button position( number)
      java.util.StringTokenizer st1= new java.util.StringTokenizer(data[Count][1],",");//level 1
// this level take the data from level 0 and dynamicaly render the position with buttons
       y= 0;
       while(st1.hasMoreTokens()){
       String s1= JB.getText().intern();
       String s2=st1.nextToken().intern();
         if ( s1== s2 )  poz=y;// the button position
       y++;
       }
      // now we know everything - show the button
      java.util.StringTokenizer st2= new java.util.StringTokenizer(data[Count][2],";");// level 2[2]
      for(y=0;y<poz+1;y++) recomendation=st2.nextToken();
      jTextPane1.setText(recomendation);// recomendation is the result from EXP file
      y=recomendation.indexOf('&');// deliminator for hiden data
      sub= recomendation.substring(y+1);// this is the string we have to pass
         java.util.StringTokenizer stsub= new java.util.StringTokenizer(sub,",");// deliminator ,
         // pass the data to weight coefficients
         weight2=Float.parseFloat(stsub.nextToken());
         weight3=Float.parseFloat(stsub.nextToken());
         weight4=Float.parseFloat(stsub.nextToken());
         weight5=Float.parseFloat(stsub.nextToken());
         weight6=Float.parseFloat(stsub.nextToken());
              jTextPane1.repaint();
}// if
//System.out.println("kazwam se:" + JB.getText());
//frame3.label4.setText(JB.getText());
  }// action Performed e
}// class Butt Listener
////////////////////////////////////////////////////////////////////////////
  //Construct the frame
  public Frame1() {
    enableEvents(AWTEvent.WINDOW_EVENT_MASK);
    try {
      jbInit();
    }
    catch(Exception e) {
      e.printStackTrace();
    }
  }
  //Component initialization
  private void jbInit() throws Exception  {
```

```
  //setIconImage(Toolkit.getDefaultToolkit().createImage(Frame1.class.getResource("[Your
Icon]")));
    contentPane = (JPanel) this.getContentPane();
    contentPane.setLayout(xYLayout1);
    this.setSize(new Dimension(720, 470));
    this.setTitle("Data Fusion System");
   contentPane.setBackground(UIManager.getColor("InternalFrame.inactiveTitleForeground"));
    jPanel1.setLayout(xYLayout2);
    jFileChooser1.addActionListener(new java.awt.event.ActionListener() {
      public void actionPerformed(ActionEvent e) {
        jFileChooser1_actionPerformed(e);
      }
    });
    jLabel1_general_info.setText("Follow the buttons");
    jButton1.setText("help");
    jButton1.addMouseListener(new java.awt.event.MouseAdapter() {
      public void mouseClicked(MouseEvent e) {
        jButton1_mouseClicked(e);
      }
    });
    jPanel2.setLayout(xYLayout3);
    jPanel3.setLayout(xYLayout4);
    jPanel5.setLayout(xYLayout6);
    jPanel6.setLayout(xYLayout7);
    jPanel7.setLayout(xYLayout8);
    jButton2.setText("Save");
    jButton2.addActionListener(new java.awt.event.ActionListener() {
      public void actionPerformed(ActionEvent e) {
        jButton2_actionPerformed(e);
      }
    });
    jLabel1.setText("Name");
    jTextField1.setText("Config.cfg");
    jTextArea1.setEditable(false);
    jTextArea1.setText("jTextArea1");
    jLabel2.setText("jLabel2");
    jPanel8.setBackground(Color.white);
    jPanel9.setBackground(Color.white);
    jTabbedPane1.addChangeListener(new javax.swing.event.ChangeListener() {// this is the main
tabbed panel
      public void stateChanged(ChangeEvent e) {// the listener is important if swishing manual
        jTabbedPane1_stateChanged(e);
      }
    });
    jPanel4.setLayout(xYLayout5);
    jTextArea3.setText("jTextArea3");
    jTextField2.setText("0.2");
    jLabel8.setText("jLabel8");
    jLabel7.setText("jLabel7");
    jLabel6.setText("jLabel6");
    jRadioButton5.setText("Resistivity");
    jRadioButton5.addActionListener(new java.awt.event.ActionListener() {
      public void actionPerformed(ActionEvent e) {
        jRadioButton5_actionPerformed(e);
      }
    });
```

```
jLabel5.setText("jLabel5");
jRadioButton4.setText("Half Cell");
jRadioButton4.addActionListener(new java.awt.event.ActionListener() {
  public void actionPerformed(ActionEvent e) {
    jRadioButton4_actionPerformed(e);
  }
});
jLabel4.setText(" General statistical information for the measurements");
jRadioButton3.setText("Covermeter(S)");
jRadioButton3.addActionListener(new java.awt.event.ActionListener() {
  public void actionPerformed(ActionEvent e) {
    jRadioButton3_actionPerformed(e);
  }
});
jLabel3.setText("jLabel3");
jRadioButton2.setText("Covermeter(C)");
jRadioButton2.addActionListener(new java.awt.event.ActionListener() {
  public void actionPerformed(ActionEvent e) {
    jRadioButton2_actionPerformed(e);
  }
});
jRadioButton1.setSelected(true);
jRadioButton1.setText("Shmit-Hammer");
jRadioButton1.addActionListener(new java.awt.event.ActionListener() {
  public void actionPerformed(ActionEvent e) {
    jRadioButton1_actionPerformed(e);
  }
});

jTextField3.setText("0.2");// the value is set if EXP file is skeeped otherwise this is overrided
jTextField4.setText("0.2");
jTextField5.setText("0.2");
jTextField6.setText("0.2");
jLabel9.setText("Shmit-Hammer");
jLabel10.setText("X");
jTextField7.setText("jTextField7");
jLabel11.setText("Y");
jTextField8.setText("jTextField8");
jButton6.setText("go");
jButton6.addMouseListener(new java.awt.event.MouseAdapter() {
  public void mouseClicked(MouseEvent e) {
    jButton6_mouseClicked(e);
  }
});
jPanel11.setBackground(SystemColor.inactiveCaptionText);
jPanel11.setBorder(BorderFactory.createLineBorder(Color.black));
jPanel11.addMouseListener(new java.awt.event.MouseAdapter() {
  public void mouseClicked(MouseEvent e) {
    jPanel11_mouseClicked(e);
  }
});
jPanel12.setBackground(SystemColor.inactiveCaptionText);
jPanel12.setBorder(BorderFactory.createLineBorder(Color.black));
jPanel12.addMouseListener(new java.awt.event.MouseAdapter() {
  public void mouseClicked(MouseEvent e) {
    jPanel12_mouseClicked(e);
```

```
  }
});
jPanel13.setBackground(SystemColor.inactiveCaptionText);
jPanel13.setBorder(BorderFactory.createLineBorder(Color.black));
jPanel13 addMouseListener(new java.awt.event.MouseAdapter() {
  public void mouseClicked(MouseEvent e) {
    jPanel13_mouseClicked(e);
  }
});
jLabel12.setText("Clicked point");
jLabel13.setText("Steel");
jLabel14.setText("Concreet");
jLabel15.setText("Total");
jButton4.setActionCommand("");
jButton4.setText("big SD");
jButton4.addActionListener(new java.awt.event.ActionListener() {
  public void actionPerformed(ActionEvent e) {
    jButton4_actionPerformed(e);
  }
});
jButton5.setText("max / min");
jButton5.addActionListener(new java.awt.event.ActionListener() {
  public void actionPerformed(ActionEvent e) {
    jButton5_actionPerformed(e);
  }
});
jButton9.setText("Reliability");
jButton9.addActionListener(new java.awt.event.ActionListener() {
  public void actionPerformed(ActionEvent e) {
    jButton9_actionPerformed(e);
  }
});
jButton10.setText("irelevant ?");
jButton10.addActionListener(new java.awt.event.ActionListener() {
  public void actionPerformed(ActionEvent e) {
    jButton10_actionPerformed(e);
  }
});
jButton11.setText("graphics");
jButton11.addActionListener(new java.awt.event.ActionListener() {
  public void actionPerformed(ActionEvent e) {
    jButton11_actionPerformed(e);
  }
});
jButton12.setText("Save report");
jButton12.addActionListener(new java.awt.event.ActionListener() {
  public void actionPerformed(ActionEvent e) {
    jButton12_actionPerformed(e);
  }
});
jLabel16.setText("Weight");
jPanel14.setLayout(xYLayout10);
jFileChooser2.addActionListener(new java.awt.event.ActionListener() {
  public void actionPerformed(ActionEvent e) {
    jFileChooser2_actionPerformed(e);
  }
```

```
    });
    jPanel10.addMouseListener(new java.awt.event.MouseAdapter() {
      public void mouseClicked(MouseEvent e) {
        jPanel10_mouseClicked(e);
      }
    });
    jButton3.setText("Splain");
    jButton3.addActionListener(new java.awt.event.ActionListener() {
      public void actionPerformed(ActionEvent e) {
        jButton3_actionPerformed(e);
      }
    });
    jButton7.setText("Clean");
    jButton7.addActionListener(new java.awt.event.ActionListener() {
      public void actionPerformed(ActionEvent e) {
        jButton7_actionPerformed(e);
      }
    });
    jLabel17.setText("Approx");
    jLabel18.setText("level");
    jTextField9.setText("1");
    jLabel19.setText("zones");
    jTextField10.setText("10");
    jLabel20.setText("Method");
class MyItemListener implements ItemListener{
          public void itemStateChanged(ItemEvent evt){
             JComboBox jComboBox1=(JComboBox) evt.getSource();
             Raster=jComboBox1.getSelectedIndex();
          }
      }
   String [] obj={"closest pt","midle 2","midle 3","midle 4"," approx 2", "approx 3", "approx 4"};//
options
   // this is from spline effect in the main experimental windows ( control all sline efects)
  JComboBox jComboBox1 = new JComboBox(obj);
    Raster= jComboBox1.getSelectedIndex();
    MyItemListener actionListener=new MyItemListener();
    jComboBox1.addItemListener(actionListener);
    jTextArea8.setDoubleBuffered(true);
    jTextArea8.setEditable(false);
    jTextArea8.setText(" LOAD ADVISE PANEL"+
                "\nIt is used to load one of"+
                "\nvariety  of expert  files"+
                "\nwith extention EXP. These"+
                "\nfiles consists information"+
                "\ncollected and stored  from"+
                "\nexperts. The file provides"+
                "\nimportant information about"+
                "\nthe  conditions  of   the"+
                "\nexperimens.   The   final"+
                "\nbenefit from using the EXP "+
                "\nfile  will  be  a  'weight"+
                "\ncoefficient for each detector."+
                "\nThe weight in our case is"+
                "\n degree of believe. So in our"+
                "\nfuture calculations  we will"+
                "\nmix the information from our"+
```

```
            "\ndetectors according to these"+
            "\ncoefficients."+
            "\nPLEASE SKEEP THE NEXT PANEL"+
            "\nIF YOU DO NOT PLANING TO MAKE"+
            "\nCHANGES IN THE EXP FILE");
jTextArea8.setLineWrap(true);
jTextArea8.setRows(20);
jTextArea9.setEditable(false);
jTextArea9.setText("How to edit your file"+
            "\nThe EXP file can be manually edited."+
            "\nThe file provide weight (0-1)float number"+
            "\nfor eash of the 5 detectors."+
            "\nThe file consist 3 level menu from "+
            "\nwhich dynamically buttons are created."+
            "\nFinally the weights are loaded into"+
            "\nnext user panel and these values are"+
            "\nused for next mix calculations."+
            "\nPLEASE NOTE THAT THE PARSER IS EXACT"+
            "\nACCORDING TO THE FORMATING AND & SYMBOL"+
            "\n FORMATING EXAMPLE:"+
            "\n Button1"+
            "\n SubButton1, SubButton2, SubButton3..."+
            "\nsubbtn1result&0.1,0.2.weights.;subbtn2res&.."+
            "\n Button2"+
            "\n ....");
jTextArea10.setEditable(false);
jTextArea10.setText("  Data File Information "+
            "\nThe data file is text"+
            "\nfile with an extension DAT."+
            "\nIt consists info for the"+
            "\ndavice, coordinates and"+
            "\nvelue of the points."+
            "\nThe values must be integer"+
            "\nin range 0-34565."+
            "\nThe deliminator is ','."+
            "\nYou can edit the file "+
            "\nduring an experiment."+
            "\nPlease note the parser"+
            "\nis exact for device names.");
jButton8.setText("update");
jButton8.addMouseListener(new java.awt.event.MouseAdapter() {
  public void mouseClicked(MouseEvent e) {
    jButton8_mouseClicked(e);
  }
});
jFileChooser1.setAcceptAllFileFilterUsed(false);
jScrollPane8.setHorizontalScrollBarPolicy(JScrollPane.HORIZONTAL_SCROLLBAR_NEVER);
jLabel21.setText("Confidental ");
jLabel22.setText("region around m");
jTextField11.setText("1.0");
jLabel23.setText("x SD");
jLabel24.setText("+ -");
jTextPane1.setText("jTextPane1");
jTextPane2.setText("jTextPane2");
jTextField12.setText("Report");
jLabel25.setText("File name");
```

```
contentPane.add(jTabbedPane1, new XYConstraints(6, 23, 700, 400));
jTabbedPane1.add(jPanel1,    "Load advise");
jPanel1.add(jFileChooser1,     new XYConstraints(12, 23, 436, 324));
jPanel1.add(jScrollPane8,      new XYConstraints(454, 5, 235, 356));
jScrollPane8.getViewport().add(jTextArea8, null);
jTabbedPane1.add(jPanel2,  "Edit file");
jPanel2.add(jButton2, new XYConstraints(279, 312, 73, 23));
jPanel2.add(jLabel1,  new XYConstraints(8, 310, 46, 19));
jPanel2.add(jTextField1, new XYConstraints(55, 310, 209, 23));
jPanel2.add(jScrollPane1,  new XYConstraints(4, 26, 348, 280));
jPanel2.add(jLabel2,    new XYConstraints(5, 4, 689, 19));
jPanel2.add(jScrollPane9,  new XYConstraints(365, 27, 321, 309));
jScrollPane9.getViewport().add(jTextArea9, null);
jScrollPane1.getViewport().add(jTextArea1, null);
jTabbedPane1.add(jPanel3,    "Proposal");
jPanel3.add(jPanel9,   new XYConstraints(7, 196, 460, 169));
jPanel3.add(jPanel8,  new XYConstraints(7, 22, 461, 158));
jPanel3.add(jScrollPane2,  new XYConstraints(476, 22, 211, 343));
jScrollPane2.getViewport().add(jTextPane1, null);
jTabbedPane1.add(jPanel14,  "Load Data");
jPanel14.add(jFileChooser2, new XYConstraints(8, 11, 456, 300));
jPanel14.add(jScrollPane10,     new XYConstraints(470, 13, 221, 350));
jScrollPane10.getViewport().add(jTextArea10, null);
jTabbedPane1.add(jPanel4,   "Statistics");
jTabbedPane1.add(jPanel5,    "Visualization");
jPanel5.add(jScrollPane5,     new XYConstraints(0, 249, 689, 117));
jPanel5.add(jLabel12, new XYConstraints(2, 231, 132, -1));
jPanel5.add(jLabel15, new XYConstraints(466, 7, 35, 16));
jPanel5.add(jLabel14, new XYConstraints(14, 10, 55, 14));
jPanel5.add(jPanel13,    new XYConstraints(4, 23, 214, 208));
jPanel5.add(jPanel12,  new XYConstraints(468, 22, 222, 211));
jPanel5.add(jPanel11,  new XYConstraints(234, 22, 222, 210));
jPanel5.add(jLabel13, new XYConstraints(234, 10, 53, 12));
jScrollPane5.getViewport().add(jTextArea5, null);
jTabbedPane1.add(jPanel6,   "Abnormality");
jPanel6.add(jButton5,  new XYConstraints(0, 55, 92, 22));
jPanel6.add(jButton4,  new XYConstraints(0, 25, 92, 20));
jPanel6.add(jScrollPane6,      new XYConstraints(96, 17, 581, 340));
jPanel6.add(jButton11, new XYConstraints(1, 279, 92, 24));
jPanel6.add(jButton9, new XYConstraints(-1, 85, 94, 24));
jPanel6.add(jButton10, new XYConstraints(0, 201, 92, 25));
jPanel6.add(jLabel22, new XYConstraints(0, 154, 95, -1));
jPanel6.add(jLabel21, new XYConstraints(4, 138, 81, 18));
jPanel6.add(jLabel24,  new XYConstraints(0, 177, 19, 19));
jPanel6.add(jTextField11, new XYConstraints(17, 176, 44, 19));
jPanel6.add(jLabel23, new XYConstraints(63, 176, 26, 20));
jScrollPane6.getViewport().add(jTextArea6, null);
jTabbedPane1.add(jPanel7,   "Report");
jPanel7.add(jScrollPane7,   new XYConstraints(6, 30, 685, 334));
jScrollPane7.getViewport().add(jTextPane2, null);
jPanel7.add(jButton12, new XYConstraints(589, 3, 100, 21));
jPanel7.add(jTextField12,  new XYConstraints(454, 4, 131, 19));
jPanel7.add(jLabel25, new XYConstraints(382, 5, 70, 18));
jPanel4.add(jScrollPane3, new XYConstraints(5, 126, 217, 240));
jScrollPane3.getViewport().add(jTextArea3, null);
jPanel10.setLayout(xYLayout9);
```

```
    jPanel10.setBackground(SystemColor.inactiveCaptionText);
    jPanel10.setBorder(BorderFactory.createLineBorder(Color.black));
    jPanel4.add(jPanel10,  new XYConstraints(223, 146, 210, 210));
    jPanel4.add(jRadioButton5, new XYConstraints(4, 102, 102, 17));
    jPanel4.add(jRadioButton4, new XYConstraints(3, 83, 98, 14));
    jPanel4.add(jRadioButton1, new XYConstraints(4, 25, -1, 13));
    jPanel4.add(jRadioButton3,  new XYConstraints(4, 62, 106, 15));
    jPanel4.add(jRadioButton2, new XYConstraints(4, 43, 99, 14));
    jPanel4.add(jLabel6,  new XYConstraints(153, 66, 536, 13));
    jPanel4.add(jLabel7,  new XYConstraints(153, 85, 540, 14));
    jPanel4.add(jLabel4,   new XYConstraints(224, 4, 308, -1));
    jPanel4.add(jTextField2, new XYConstraints(113, 23, 31, 16));
    jPanel4.add(jTextField5, new XYConstraints(113, 84, 32, 17));
    jPanel4.add(jTextField6, new XYConstraints(113, 106, 34, 16));
    jPanel4.add(jLabel3,  new XYConstraints(152, 24, 543, 14));
    jPanel4.add(jLabel16,  new XYConstraints(109, 3, 40, 19));
    jPanel4.add(jLabel8, new XYConstraints(152, 107, 541, 16));
    jPanel4.add(jScrollPane4,     new XYConstraints(493, 132, 197, 232));
    jPanel4.add(jTextField7, new XYConstraints(449, 169, 39, 18));
    jPanel4.add(jTextField8, new XYConstraints(449, 195, 40, 16));
    jPanel4.add(jLabel11, new XYConstraints(436, 196, 15, 15));
    jPanel4.add(jLabel10, new XYConstraints(438, 171, 15, 16));
    jPanel4.add(jLabel19, new XYConstraints(448, 265, 44, 14));
    jPanel4.add(jTextField10, new XYConstraints(444, 279, 45, 17));
    jPanel4.add(jButton7, new XYConstraints(223, 358, 74, 14));
    jPanel4.add(jButton3, new XYConstraints(304, 358, 73, 14));
    jPanel4.add(jComboBox1,  new XYConstraints(383, 357, 108, 16));
    jPanel4.add(jLabel17, new XYConstraints(448, 298, 42, 19));
    jPanel4.add(jLabel18, new XYConstraints(448, 313, 39, 15));
    jPanel4.add(jTextField9, new XYConstraints(462, 326, 27, 15));
    jPanel4.add(jLabel20, new XYConstraints(443, 345, 49, 13));
    jPanel4.add(jButton6, new XYConstraints(440, 215, 50, 18));
    jPanel4.add(jLabel9,  new XYConstraints(323, 127, 101, 16));
    jPanel4.add(jButton8,      new XYConstraints(223, 126, 76, 17));
    jPanel4.add(jTextField4, new XYConstraints(114, 64, 30, 18));
    jPanel4.add(jTextField3, new XYConstraints(114, 43, 31, 16));
    jPanel4.add(jLabel5, new XYConstraints(152, 44, 540, -1));
    jScrollPane4.getViewport().add(jTextArea4, null);
    contentPane.add(jButton1,    new XYConstraints(633, 6, 70, 23));
    contentPane.add(jLabel1_general_info,   new XYConstraints(6, 3, 620, 22));
    buttonGroup1.add(jRadioButton1);
    buttonGroup1.add(jRadioButton2);
    buttonGroup1.add(jRadioButton3);
    buttonGroup1.add(jRadioButton4);
    buttonGroup1.add(jRadioButton5);
//   if(buttonGroup1.isSelected()) beep;
  }
  void jTextArea1_actionPerformed(ActionEvent e){
System.exit(0);
}
  //Overridden so we can exit when window is closed
  protected void processWindowEvent(WindowEvent e) {
    super.processWindowEvent(e);
    if (e.getID() == WindowEvent.WINDOW_CLOSING) {
      System.exit(0);
    }
```

```
 }
 void jFileChooser1_actionPerformed(ActionEvent e) {
// this have to load the file into the second frame and show it
 // reading the text file
  // String filename = "TestData EXP";
 // System.out.print(jFileChooser1.getSelectedFile());
   filename = jFileChooser1.getSelectedFile().toString();
   jLabel2.setText(" loaded file is: "+filename);
   try{
    BufferedReader in= new BufferedReader(new FileReader(filename));
    String line ;
     jTextArea1.setText("");
     while( (line = in.readLine())!=null){
     jTextArea1.append(line);jTextArea1.append("\n");// read the file in jTextArea1
     }
     in.close();
   }
 catch (IOException f){
     jLabel2.setText("Problem in loadding");
 }
jTabbedPane1.setSelectedIndex(1);// show the second frame
}
 void jButton2_actionPerformed(ActionEvent e) {// this save the file using new name
// the file is saved in current directory
try{
//File f = new File("TestData.config");
   File f = new File(jTextField1.getText());
   String line;
    PrintWriter out = new PrintWriter(new FileWriter(f));
    out.println(jTextArea1.getText());
    out.close();
    jLabel2.setText("new file saved:"+ jTextField1.getText());
    }
catch (IOException aq){
     jLabel2.setText("Save problem");
   }
     }
// if we swish between the panels
 void jTabbedPane1_stateChanged(ChangeEvent e) {// this activate button drowings in Panel3
   if( jTabbedPane1.getSelectedIndex()==0)
       jLabel1_general_info.setText("Please locate and load expert file (*.EXP)");
   if (jTabbedPane1.getSelectedIndex()==1)
         jLabel1_general_info.setText("Editing the EXP file ! Are you really want? IF YOU ARE
USER SKEEP THE PANEL AND GO TO PROPOSAL PANEL");
   if( jTabbedPane1.getSelectedIndex()==2){
         jLabel1_general_info.setText("Please choose your case and see the advise. The weights
coeff. will be stored in Statistics panel.(editable data)");
          //if ( 2==jTabbedPane1.getSelectedIndex()){
      //  System.out.print("jTablePane==2\n");
      // text parser for the file with instruction ( the infromation is in textArea1 in Frame2
            jPanel8.removeAll();
            jPanel9.removeAll();
            jTextPane1.setText("");
            jPanel3.repaint();
            String s= jTextArea1.getText();
            java.util.StringTokenizer st=new java.util.StringTokenizer(s,"\n");
```

```
            Counter=0;
                  while(st.hasMoreTokens()){
                  data[Counter][0]= st.nextToken();// this is the first line bit it consist only 1 button !
                  data[Counter][1]= st.nextToken();// this is the second line
                  data[Counter][2]= st.nextToken();// tirth line form the text file
                  Counter++;// the variable keeps the size of the data
                  }// while
               // this is initial paint on panel1
               ButtListener bl= new ButtListener();
               //frame3.panel1.removeAll();
               //frame3.panel1.invalidate();
          for (int x=0; x<Counter;x++){
               JButt[x]= new JButton(data[x][0]);// create the button
               JButt[x].addActionListener(bl);// add listener
               jPanel8.add(JButt[x]);
          }// for
       jPanel8.validate();
     }//if
     if( jTabbedPane1.getSelectedIndex()==3){
           jLabel1_general_info.setText("Please locate and load the data file ( *.dat)");
          jTextField2.setText("0.2");
          jTextField3.setText("0.2");
          jTextField4.setText("0.2");
          jTextField5.setText("0.2");
          jTextField6.setText("0.2");
          // check if EXP file is loaded weight
          if (weight2 > 0.0) jTextField2.setText(Float.toString(weight2));
          if (weight3 > 0.0) jTextField3.setText(Float.toString(weight3));
          if (weight4 > 0.0) jTextField4.setText(Float.toString(weight4));
          if (weight5 > 0.0) jTextField5.setText(Float.toString(weight5));
          if (weight6 > 0.0) jTextField6.setText(Float.toString(weight6));
     }//if
     if(jTabbedPane1.getSelectedIndex()==4)
        jLabel1_general_info.setText("Please analyse the data.The panel provide editable and
visual, global and local information for loaded data file");
       if(jTabbedPane1.getSelectedIndex()==5){
        jLabel1_general_info.setText("Weight mixture information is presented on sensitive panels.
Change the graphical scale from previous panel");
               // now here we have to collext the data from the 5 devices if they excists
               // for conctrete 2 devices( Shmith Hammer)+(Covermeter)
               // for steel 3 devices (Covermether(S))(Half_cell+Resistivity
               // create the data arrays for the 5 devices ( 200X200)
              //   double [][][] dev_graph = new double [6][201][201];
               // now mastab,Raster and General_sw    ->calculate the tings
                                        // NEW MASTAB based on 5 devices together
                                int  maxX=0; int maxY=0;
                                 for( int m=1;m<6;m++){
                                    for(int x=1;x<d[m-1][0][0]+1;x++){
                                         if(d[m-1][x][1]>maxX) maxX=d[m-1][x][1];
                                         if(d[m-1][x][2]>maxY) maxY=d[m-1][x][2];
                                    }// for
                                  }// for m
                                 // System.out.print("maxX="+maxX +" maxY="+maxY);
                                 if(maxX > maxY) mastab_all_devices= (float)200.0/(float)maxX;
                                 else mastab_all_devices= (float)200.0/(float)maxY;
          for(int dev=1 ; dev<6; dev++){
```

```
                    if (d[dev-1][0][0]==0){
                        // dev_graph[dev][0][0]=0;can perform on d[][][]
                         for(int x=1;x<201;x++){
                            for(int y=1;y<201;y++){
                              dev_graph[dev][x][y]=0;
                             }//y
                          }//x
                     }//if
                     else{
                     // the data presents for this device
                          // can perform on d[][][] dev_graph[dev][0][0]=1;//has data
                     // now we have mastab,mark and Raster
                    doiterations(mastab_all_devices,dev);
                    // now collect the data
                          for(int x=1;x<201;x++){
                            for(int y=1;y<201;y++){
                              dev_graph[dev][x][y]=graph[x][y];
                             }//y
                          }//x
                       }// else
          }// for
          // here sould be normalization before output!
          double maxVal=0.0;
          double koef_norm=0.0;
           for(int dev=1 ; dev<6; dev++){
                if(dev==1) koef_norm=Double.valueOf(jTextField2.getText().trim()).doubleValue();
                if(dev==2) koef_norm=Double.valueOf(jTextField3.getText().trim()).doubleValue();
                if(dev==3) koef_norm=Double.valueOf(jTextField4.getText().trim()).doubleValue();
                if(dev==4) koef_norm=Double.valueOf(jTextField5.getText().trim()).doubleValue();
                if(dev==5) koef_norm=Double.valueOf(jTextField6.getText().trim()).doubleValue();
                    if (d[dev-1][0][0]>0){
                        // dev_graph[dev][0][0]=0;can perform on d[][][]
                         for(int x=1;x<201;x++){
                            for(int y=1;y<201;y++){
                              if (maxVal< dev_graph[dev][x][y]) maxVal=dev_graph[dev][x][y];
                             }//y
                          }//x
                          for(int x=1;x<201;x++){
                            for(int y=1;y<201;y++){
                              dev_graph[dev][x][y]=
(dev_graph[dev][x][y]*1000*koef_norm)/maxVal;
                             }//y
                          }//x
                     }//if
              } // for
           // according to the schema 0.1,0.2,0.3,0.4...
                    jPanel13.repaint();
                    jPanel11.repaint();
                    jPanel12.repaint();
          }// JTabledPane1.getSelected Infex
 if(jTabbedPane1.getSelectedIndex()==6)
        jLabel1_general_info.setText("This panel provids information for abnormal experiamntal
data");
if(jTabbedPane1.getSelectedIndex()==7){
        jLabel1_general_info.setText("The report panel is editable and provide basic information
for the experiment. The report saves txt format.");
```

```
// just has to collect the information from the experiemt and store in propoer possition.
        jTextPane2.setText("          R E P O R T "+
        "\n\n 1). The initial expert file is "+jFileChooser1.getSelectedFile()+"."+
        "\n From the proposal options the expert result string is:"+ jTextPane1.getText()+"."+
        "\n\n 2). The data file with name "+ jFileChooser2.getSelectedFile()+" was loaded "+
        "\n The working data are:\n"+jTextArea3.getText()+"."+
        "\n\n 3). The weights for the devices are:"+
        "\n"+jTextField2.getText()+
        "\n"+jTextField3.getText()+
        "\n"+jTextField4.getText()+
        "\n"+jTextField5.getText()+
        "\n"+jTextField6.getText()+
        "\n\n 4). Gloabal analysis for the data show:"+
        "\n device 1:"+jLabel3.getText()+
        "\n device 2:"+jLabel5.getText()+
        "\n device 3:"+jLabel6.getText()+
        "\n device 4:"+jLabel7.getText()+
        "\n device 5:"+jLabel8.getText()+
        "\n\n 5). Provided experiments for particular points:"+ jTextArea4.getText()+
        "\n\n 6). Provided visualization point's checking analyse:"+
        "\n"+jTextArea5.getText()+"."+
        "\n\n 7). Abnormality experiments:"+
        "\n"+jTextArea6.getText()
        );
                        }// index 7 close
  }// jTabledPane.....State changes
  JScrollPane jScrollPane4 = new JScrollPane();
  JScrollPane jScrollPane3 = new JScrollPane();
  JTextArea jTextArea3 = new JTextArea();
  JTextField jTextField2 = new JTextField();
  JLabel jLabel8 = new JLabel();
  JLabel jLabel7 = new JLabel();
  JLabel jLabel6 = new JLabel();
  JRadioButton jRadioButton5 = new JRadioButton();
  JLabel jLabel5 = new JLabel();
  JRadioButton jRadioButton4 = new JRadioButton();
  JLabel jLabel4 = new JLabel();
  JRadioButton jRadioButton3 = new JRadioButton();
  JLabel jLabel3 = new JLabel();
  JRadioButton jRadioButton2 = new JRadioButton();
  JRadioButton jRadioButton1 = new JRadioButton();
  XYLayout xYLayout5 = new XYLayout();
  JTextField jTextField3 = new JTextField();
  JTextField jTextField4 = new JTextField();
  JTextField jTextField5 = new JTextField();
  JTextField jTextField6 = new JTextField();
  JLabel jLabel9 = new JLabel();
  JLabel jLabel10 = new JLabel();
  JTextField jTextField7 = new JTextField();
  JLabel jLabel11 = new JLabel();
  JTextField jTextField8 = new JTextField();
  JButton jButton6 = new JButton();
  JPanel jPanel11 = new My_2_Panel();
  JPanel jPanel12 = new My_3_Panel();
  JPanel jPanel13 = new My_1_Panel();
  JScrollPane jScrollPane5 = new JScrollPane();
```

```
  JTextArea jTextArea5 = new JTextArea();
  JLabel jLabel12 = new JLabel();
  JLabel jLabel13 = new JLabel();
  JLabel jLabel14 = new JLabel();
  JLabel jLabel15 = new JLabel();
  JButton jButton4 = new JButton();
  JButton jButton5 = new JButton();
  JButton jButton9 = new JButton();
  JButton jButton10 = new JButton();
  JButton jButton11 = new JButton();
  JScrollPane jScrollPane6 = new JScrollPane();
  JScrollPane jScrollPane7 = new JScrollPane();
  JButton jButton12 = new JButton();
  JLabel jLabel16 = new JLabel();
  ButtonGroup buttonGroup1 = new ButtonGroup();
  JPanel jPanel14 = new JPanel();
  XYLayout xYLayout10 = new XYLayout();
  JFileChooser jFileChooser2 = new JFileChooser();
  JButton jButton3 = new JButton();
  JButton jButton7 = new JButton();
  JTextArea jTextArea4 = new JTextArea();
  JLabel jLabel17 = new JLabel();
  JLabel jLabel18 = new JLabel();
  JTextField jTextField9 = new JTextField();
  JLabel jLabel19 = new JLabel();
  JTextField jTextField10 = new JTextField();
  JLabel jLabel20 = new JLabel();
  JScrollPane jScrollPane8 = new JScrollPane();
  JTextArea jTextArea8 = new JTextArea();
  JScrollPane jScrollPane9 = new JScrollPane();
  JTextArea jTextArea9 = new JTextArea();
  JScrollPane jScrollPane10 = new JScrollPane();
  JTextArea jTextArea10 = new JTextArea();
  JButton jButton8 = new JButton();
  JTextArea jTextArea6 = new JTextArea();
  JLabel jLabel21 = new JLabel();
  JLabel jLabel22 = new JLabel();
  JTextField jTextField11 = new JTextField();
  JLabel jLabel23 = new JLabel();
  JLabel jLabel24 = new JLabel();
  JTextPane jTextPane1 = new JTextPane();
  JTextPane jTextPane2 = new JTextPane();
  JTextField jTextField12 = new JTextField();
  JLabel jLabel25 = new JLabel();
// load the data file
  void jFileChooser2_actionPerformed(ActionEvent e) {
  filename1 = jFileChooser2.getSelectedFile().toString();
 try{
 int Device=0;  Count_row=0;
    // String filename = "TestData.txt";
     Counter=0;// count the lines
    BufferedReader in= new BufferedReader(new FileReader(filename1));
      jTextArea3.setText("");
      while( (line = in.readLine())!=null){
   //  System.out.print(line);//pass OK
      Counter++; Count_row=0;
```

```
    // jTextArea3.append(line); jTextArea3.append("\n");
    java.util.StringTokenizer st= new java.util.StringTokenizer(line,",");// deliminator,
                    while(st.hasMoreTokens()){
                       pice=st.nextToken().toString();
                // System.out.print(pice);//pass OK
                       if(pice.intern()=="Shmith-
Hammer".intern()){Device=0;Count_row=0;Counter=0;}
                       else
if(pice.intern()=="Covermeter(C)".intern()){Device=1;Count_row=0;Counter=0;}
                       else
if(pice.intern()=="Covermeter(S)".intern()){Device=2;Count_row=0;Counter=0;}
                       else if(pice.intern()=="Half Cell".intern()){Device=3;Count_row=0;Counter=0;}
                       else
if(pice.intern()=="Resistivity".intern()){Device=4;Count_row=0;Counter=0;}
                       else{
                        Count_row++;
                       // System.out.print(pice);
                      //  System.out.print(Device + " " + Counter + " " + Count_row+"\n");
                        d[Device][Counter][Count_row]=Integer.parseInt(pice.trim());//
                       // System.out.print(Float.parseFloat(pice.trim()));
                      //  System.out.print("\n");
                        d[Device][Counter][0]= Count_row;
                        d[Device][0][0]=Counter;
                        }//else
                    }// while
    }// while
     in.close();
// this output statistic for all data for the device
// check if device information missing
dostatistics();// make general statistics
   }//try
  catch (IOException f){
    // jLabel2.setText("Problem in loadding");
  }
}// end jFile Chooser2

void dostatistics(){
int Device,NumberPoints,Measurements,MaxVal,MinVal;
double MidVal,SD,TotalVal;

  if(d[0][0][0]==0){ jRadioButton1.invalidate();jLabel3.setText("No information for this device");}
  if(d[1][0][0]==0){ jRadioButton2.invalidate();jLabel5.setText("No information for this device");}
  if(d[2][0][0]==0){ jRadioButton3.invalidate();jLabel6.setText("No information for this device");}
  if(d[3][0][0]==0){ jRadioButton4.invalidate();jLabel7.setText("No information for this device");}
  if(d[4][0][0]==0){ jRadioButton5.invalidate();jLabel8.setText("No information for this device");}
  // global analysis
for ( Device=0;Device<5;Device++){
        if (d[Device][0][0]>0){
            NumberPoints=d[Device][0][0];Measurements=0;MaxVal=-
34500;MinVal=34500;TotalVal=0;SD=0;
          for(int x=1 ;x<d[Device][0][0]+1;x++){
             Measurements=Measurements+(d[Device][x][0]-2);
               for(int y=3;y<d[Device][x][0]+1;y++){
                    if(d[Device][x][y]>MaxVal)MaxVal=d[Device][x][y];
                    if(d[Device][x][y]<MinVal)MinVal=d[Device][x][y];
                    TotalVal=TotalVal+d[Device][x][y];
```

```
                }
            }// for
// now we have the mid value and Measurements ... time for SD=sqrt(  (sum(x-Midval)^2)/Measurements-1)
                // System.out.print("\n total"+TotalVal+" Meas="+Measurements);
              MidVal= TotalVal/Measurements;SD=0;
            for(int x=1 ;x<d[Device][0][0]+1;x++){
                for(int y=3;y<d[Device][x][0]+1;y++){
                SD=SD+((double)d[Device][x][y]-MidVal)*((double)d[Device][x][y]-MidVal);
               // System.out.print("\n"+SD);
                }
            }
              // System.out.print("\n"+SD+"measurem-1="+(Measurements-1));
              SD=Math.sqrt(SD/(double)(Measurements-1.0));
 // now is the time for output global analysis
              o="All  measurements="+Measurements+"  num.points="+NumberPoints+" max="+MaxVal+" min="+MinVal+" mid="+MidVal+" St.Dev="+SD;
              if (Device==0)  jLabel3.setText(o);
              if (Device==1)  jLabel5.setText(o);
              if (Device==2)  jLabel6.setText(o);
              if (Device==3)  jLabel7.setText(o);
            if (Device==4)  jLabel8.setText(o);
         }// if
}// for
// Here we paste the data for eash point for eash measurement in the text field
jTextArea3.setText("");
for(Device=0;Device<5;Device++){
 if(d[Device][0][0]>0){
     if(Device==0 && jTextArea3.getText().intern()!="".intern()){jTextArea3.setText(jTextArea3.getText()+"\nShmith-Hammer");}
     if(Device==0 && jTextArea3.getText().intern()=="".intern()) {jTextArea3.setText("Shmith-Hammer");}
     if(Device==1 && jTextArea3.getText().intern()!="".intern()){jTextArea3.setText(jTextArea3.getText()+"\nCovermeter (C)");}
     if(Device==1 && jTextArea3.getText().intern()=="".intern()) jTextArea3.setText("Covermeter(C)");
     if(Device==2 && jTextArea3.getText().intern()!="".intern()){jTextArea3.setText(jTextArea3.getText()+"\nCovermeter (S)");}
     if(Device==2 && jTextArea3.getText().intern()=="".intern()) jTextArea3.setText("Covermeter(S)");
     if(Device==3 && jTextArea3.getText().intern()!="".intern()){jTextArea3.setText(jTextArea3.getText()+"\nHalf Cell");}
     if(Device==3 && jTextArea3.getText().intern()=="".intern()) jTextArea3.setText("Half Cell");
     if(Device==4 && jTextArea3.getText().intern()!="".intern()){jTextArea3.setText(jTextArea3.getText()+"\nResistivity");}
     if(Device==4 && jTextArea3.getText().intern()=="".intern()) jTextArea3.setText("Resistivity");
    for (int x=1;x<d[Device][0][0]+1;x++){// we pass trough each row into the device data
// before to output the data we need standart deviation for each row to be calculated and outputed so we
// have to calculate it and store for output. This is important for unconsistant data detection
//
     Measurements=d[Device][x][0]-2;MaxVal=-34500;MinVal=34500;TotalVal=0;SD=0;
```

```
                for(int y=3;y<d[Device][x][0]+1;y++){
                 if(d[Device][x][y]>MaxVal)MaxVal=d[Device][x][y];
                 if(d[Device][x][y]<MinVal)MinVal=d[Device][x][y];
                 TotalVal=TotalVal+d[Device][x][y];
                }//y
                MidVal= TotalVal/Measurements;
                for(int y=3;y<d[Device][x][0]+1;y++){
                 SD=SD+ ((double)d[Device][x][y]-MidVal)*((double)d[Device][x][y]-MidVal);
                }//y
                SD=Math.sqrt(SD/(double)(Measurements-1));// this is the value we need
               // System.out.print(SD);
                ////////////////////////////////////////////////
    jTextArea3.setText(    jTextArea3.getText()+"\n"+x+"    ("+(d[Device][x][0]-2)+")    SD="+SD+",
x="+d[Device][x][1]+", y="+d[Device][x][2]+" ");
      for(y=3;y<d[Device][x][0]+1;y++){
      jTextArea3.setText(jTextArea3.getText()+","+d[Device][x][y]);
      }
    }
  }// if
}// for

 jTabbedPane1.setSelectedIndex(4);// show the second frame
 }// end statistics method
/// ETO TUKA E PROBLEMA SEGA KATO UPDATEWAM JPANEL10. REPAINT IZKAM W
ZAWISIMOST OT
/// SEL promenliwata DA SE PISHE IMETO NA PROBAATA wij wyw MY PANEL...
// TOWA E WAJNO ZASTOTO triabwa da wzimam i dannite ot matricite i da gi chertaja w
zawsimost ot sel
// Idejata e kato se click na radiobutonite da moje jPanel 10 da pokazwa dannite za
// suotwetnoto ustrojsto i da gi izwlisha ot d[][][] matricata/!!!!!!
// w po kyden stadii ne ot d[][][] a direktno ste se parsirat ot tekstowoto pole za da moje da se
korigirat on-line
// ot usera !
  void jRadioButton5_actionPerformed(ActionEvent e) {
jLabel9.setText("Resistivity"); General_sw=0;jPanel10.repaint();mark=1;
  }
 void jRadioButton4_actionPerformed(ActionEvent e) {
jLabel9.setText("Half Cell");General_sw=0;jPanel10.repaint();mark=2;
  }
  void jRadioButton3_actionPerformed(ActionEvent e) {
jLabel9.setText("Covermeter(S)");General_sw=0;jPanel10.repaint();mark=3;
  }
  void jRadioButton2_actionPerformed(ActionEvent e) {
jLabel9.setText("Covermeter(C)");General_sw=0;jPanel10.repaint();mark=4;
  }
  void jRadioButton1_actionPerformed(ActionEvent e) {
jLabel9.setText("Shmith-Hammer");General_sw=0;jPanel10.repaint();mark=5;
  }
  void jPanel10_mouseClicked(MouseEvent e) {
//jTextField7.setText(Integer.toString(e.getX()));
//jTextField8.setText(Integer.toString(e.getY()));
jTextField7.setText(Integer.toString((int)((float)e.getX()/mastab)));
jTextField8.setText(Integer.toString((int)((float)e.getY()/mastab)));
jButton6.doClick();// just visual effect
action1((int)((float)e.getX()/mastab),(int)((float)e.getY()/mastab)),// this is in case we click GO
  }
```

```
// this is the main graphical screen
public class MyPanel extends JPanel {
  public void paintComponent(Graphics g)
  {
  super.paintComponent(g);
  Graphics2D g2=(Graphics2D)g;
    if(General_sw==0){// dots on the screen
            // extract the model and describe the slab
           g2.setColor(Color.red);
          //Frame1 fr= new Frame1();
          //System.out.print(d[0][0][0]);// towa e stojnostta na element ot d matrix
           if(jRadioButton1.isSelected()) mark=1;
           if(jRadioButton2.isSelected()) mark=2;
           if(jRadioButton3.isSelected()) mark=3;
           if(jRadioButton4.isSelected()) mark=4;
           if(jRadioButton5.isSelected()) mark=5;
          // check the model and produce the output
               if(d[mark-1][0][0]==0) g2.drawString("No data here",20,20);
               else{
                   // if d[mark-1][0][0]<>0 has data and find max x y and form mastab
                  int  maxX=0; int maxY=0;
                              for(int x=1;x<d[mark-1][0][0]+1;x++){
                              if(d[mark-1][x][1]>maxX) maxX=d[mark-1][x][1];
                              if(d[mark-1][x][2]>maxY) maxY=d[mark-1][x][2];
                             //  System.out.print(d[mark-1][x][1]+"\n");
                              }// for
                              // System.out.print("maxX="+maxX +" maxY="+maxY);
                              if(maxX > maxY) mastab= (float)200.0/(float)maxX;
                              else mastab= (float)200.0/(float)maxY;
                             // System.out.println(" mastab= "+mastab+"\n");
                             // show the slab data
                                 for(int x=1;x<d[mark-1][0][0]+1;x++){
                                 g2.drawLine((int)(d[mark-1][x][1]*mastab),(int)(d[mark-
1][x][2]*mastab),(int)(d[mark-1][x][1]*mastab),(int)(d[mark-1][x][2]*mastab));
                                 }//
                }// else
           // g2.drawString(d[0][0][0],20,20);
            //g2.fillRect(20,50,60,40);
          //  g2.drawLine(12,12,12,12);
       }//general switsh
   if ( General_sw==1){// this is spline

             double maxV=0; double minV=10000000;
              for (int XXX=1;XXX<201;XXX++){
                for(int YYY=1;YYY<201;YYY++){
                  if (graph[XXX][YYY]>maxV)maxV=graph[XXX][YYY];
                  if (graph[XXX][YYY]<minV)minV=graph[XXX][YYY];
                }
               // now we have the max and the minV
              }
             double Unit=(maxV-minV)/Integer.parseInt(jTextField10.getText().trim());
            int ColorF=255/Integer.parseInt(jTextField10.getText().trim());

      for(int max=0;max< Integer.parseInt (jTextField10.getText().trim());max++){
             for (int XXX=1;XXX<201;XXX++){
              for(int YYY=1;YYY<201;YYY++){
```

```
                if (graph[XXX][YYY]>=minV+max*Unit && graph[XXX][YYY]<=minV+(max+1)*Unit
){
                    g2.setColor(new
Color((int)(ColorF*(max+1)),(int)(ColorF*(max+1)),(int)(ColorF*(max+1)) ));
                    g2.drawLine(XXX,YYY,XXX,YYY);
                  }// if
                 }//YYY
                }//XXX
        }//max
 }// if Genetal_sw==1
General_sw=0;
      }// paint Component
  }// MyPanel
  //This is screen graphicsl for steel
public class My_1_Panel extends JPanel {
  public void paintComponent(Graphics g)
  {
  super.paintComponent(g);
  Graphics2D g2=(Graphics2D)g;
// here is for concrete
             double maxV=0; double minV=10000000;
              for (int XXX=1;XXX<201;XXX++){
                for(int YYY=1;YYY<201;YYY++){
                  if                                                    (dev_graph[1][XXX][YYY]+
dev_graph[2][XXX][YYY]>maxV)maxV=dev_graph[1][XXX][YYY]+ dev_graph[2][XXX][YYY];
                  if                                                    (dev_graph[1][XXX][YYY]+
dev_graph[2][XXX][YYY]<minV)minV=dev_graph[1][XXX][YYY]+ dev_graph[2][XXX][YYY];
                 }//YYY
                // now we have the max and the minV
               }//XXX
              double Unit=(maxV-minV)/Integer.parseInt(jTextField10.getText().trim());
            int ColorF=255/Integer.parseInt(jTextField10.getText().trim());
       for(int max=0;max< Integer.parseInt (jTextField10.getText().trim());max++){
              for (int XXX=1;XXX<201;XXX++){
               for(int YYY=1;YYY<201;YYY++){
                 if    (dev_graph[1][XXX][YYY]+    dev_graph[2][XXX][YYY]>=minV+max*Unit    &&
dev_graph[1][XXX][YYY]+ dev_graph[2][XXX][YYY]<=minV+(max+1)*Unit ){
                    g2.setColor(new Color((int)(ColorF*(max)),(int)(ColorF*(max)),(int)(ColorF*(max))
));
                    g2.drawLine(XXX,YYY,XXX,YYY);
                  }// if
                 }//YYY
                }//XXX
        }//max
      }// paint Component
  }// My_1_Panel
//graphicsl screen for steel
public class My_2_Panel extends JPanel {
  public void paintComponent(Graphics g)
  {
  super.paintComponent(g);
  Graphics2D g2=(Graphics2D)g;
 // here is for STEEL
             double maxV=0; double minV=10000000;
              for (int XXX=1;XXX<201;XXX++){
                for(int YYY=1;YYY<201;YYY++){
```

```
                if                (dev_graph[3][XXX][YYY]+                dev_graph[4][XXX][YYY]+
dev_graph[5][XXX][YYY]>maxV)maxV=dev_graph[3][XXX][YYY]+        dev_graph[4][XXX][YYY]+
dev_graph[5][XXX][YYY];
                if                (dev_graph[3][XXX][YYY]+                dev_graph[4][XXX][YYY]+
dev_graph[5][XXX][YYY]<minV)minV=dev_graph[3][XXX][YYY]+        dev_graph[4][XXX][YYY]+
dev_graph[5][XXX][YYY];
                }
               // now we have the max and the minV
              }
              double Unit=(maxV-minV)/Integer.parseInt(jTextField10.getText().trim());
            int ColorF=255/Integer.parseInt(jTextField10.getText().trim());

       for(int max=0;max< Integer.parseInt (jTextField10.getText().trim());max++){
              for (int XXX=1;XXX<201;XXX++){
               for(int YYY=1;YYY<201;YYY++){
                 if                (dev_graph[3][XXX][YYY]+                dev_graph[4][XXX][YYY]+
dev_graph[5][XXX][YYY]>=minV+max*Unit                &&                dev_graph[3][XXX][YYY]+
dev_graph[4][XXX][YYY]+ dev_graph[5][XXX][YYY]<=minV+(max+1)*Unit ){
                   g2.setColor(new
Color((int)(ColorF*(max+1)),(int)(ColorF*(max+1)),(int)(ColorF*(max+1)) ));
                   g2.drawLine(XXX,YYY,XXX,YYY);
                 }// if
               }//YYY
              }//XXX
        }//max
     }// paint Component
  }// My_2_Panel
  //graphicsl screen for total
public class My_3_Panel extends JPanel {

  public void paintComponent(Graphics g)
  {
  super.paintComponent(g);
  Graphics2D g2=(Graphics2D)g;
// here is for TOTAL
              double maxV=0; double minV=10000000;
               for (int XXX=1;XXX<201;XXX++){
                 for(int YYY=1;YYY<201;YYY++){
                   if (dev_graph[1][XXX][YYY]+ dev_graph[2][XXX][YYY]+dev_graph[3][XXX][YYY]+
dev_graph[4][XXX][YYY]+        dev_graph[5][XXX][YYY]>maxV)maxV=dev_graph[1][XXX][YYY]+
dev_graph[2][XXX][YYY]+dev_graph[3][XXX][YYY]+                dev_graph[4][XXX][YYY]+
dev_graph[5][XXX][YYY];
                   if (dev_graph[1][XXX][YYY]+ dev_graph[2][XXX][YYY]+dev_graph[3][XXX][YYY]+
dev_graph[4][XXX][YYY]+        dev_graph[5][XXX][YYY]<minV)minV=dev_graph[1][XXX][YYY]+
dev_graph[2][XXX][YYY]+dev_graph[3][XXX][YYY]+                dev_graph[4][XXX][YYY]+
dev_graph[5][XXX][YYY];
                }
               // now we have the max and the minV
              }
              double Unit=(maxV-minV)/Integer.parseInt(jTextField10.getText().trim());
            int ColorF=255/Integer.parseInt(jTextField10.getText().trim());

       for(int max=0;max< Integer.parseInt (jTextField10.getText().trim());max++){
              for (int XXX=1;XXX<201;XXX++){
               for(int YYY=1;YYY<201;YYY++){
```

```
                if  (dev_graph[1][XXX][YYY]+  dev_graph[2][XXX][YYY]+dev_graph[3][XXX][YYY]+
dev_graph[4][XXX][YYY]+                dev_graph[5][XXX][YYY]>=minV+max*Unit                &&
dev_graph[1][XXX][YYY]+                          dev_graph[2][XXX][YYY]+dev_graph[3][XXX][YYY]+
dev_graph[4][XXX][YYY]+ dev_graph[5][XXX][YYY]<=minV+(max+1)*Unit ){
                    g2.setColor(new
Color((int)(ColorF*(max+1)),(int)(ColorF*(max+1)),(int)(ColorF*(max+1)) ));
                    g2.drawLine(XXX,YYY,XXX,YYY);
                  }// if
                }//YYY
              }//XXX
          }//max

       }// paint Component
  }// My_3_Panel
  void jButton6_mouseClicked(MouseEvent e) {
action1(Integer.parseInt(jTextField7.getText().trim()),Integer.parseInt(jTextField8.getText().trim()))
;
}
// this is math spline for 1 point ( virtual random point in field)
void action1(int XX, int YY){// this is a real data mastabbed
          int  control_point=-1;
// haha first lets check the point exist ot not? in the imputa data
           for( int row=1;row < d[mark-1][0][0]+1;row++){
               if  (XX==  d[mark-1][row][1] && YY== d[mark-1][row][2])control_point=row;
           }
 // if teh point ecxists the 'control_point is row
           if (control_point>-1){
                    int row=control_point;
                    // find the mddle value and assigne to graph[][]
                    double total=0;
                     for( int col=3;col<d[mark-1][row][0]+1;col++){
                         total=total+d[mark-1][row][col];
                      }
                   jTextArea4.setText(jTextArea4.getText()+"\n====================\nThis        is
database point X"+XX+" Y"+YY +"\n value "+total/(d[mark-1][row][0]-2));
           }// if
 // if not mama mia calculations
          else{
// This is the function fortransferring the data and founding 4 closest points
                for(int x=0;x<4;x++){
                      dist[x]= 30000;
                      PX[x]=0;PY[x]=0;
                      }
                for( int max=0;max<4;max++){
                   for( int row=1;row < d[mark-1][0][0]+1;row++){
                  int  Xi=  d[mark-1][row][1]  ;
                  int  Yi=  d[mark-1][row][2]  ;
             double AA=Math.sqrt ((XX-Xi)*(XX-Xi)+(YY-Yi)*(YY-Yi));
                    //  System.out.print("\n row="+row+" "+AA+" "+Xi+" "+Yi+"\n");
                     if (max==0 && dist[max]>AA){ dist[max]=AA;PX[max]=Xi;PY[max]=Yi;}
                     if  (max==1  &&  dist[max]>AA  &&  (PX[0]!=Xi  ||  PY[0]!=Yi)){dist[max]=AA;
PX[max]=Xi; PY[max]=Yi;}//if
                     if  (max==2  &&  dist[max]>AA  &&  (PX[0]!=Xi  ||  PY[0]!=Yi)  &&  (PX[1]!=Xi  ||
PY[1]!=Yi)) {dist[max]=AA;PX[max]=Xi;PY[max]=Yi; }//if
                     if  (max==3  &&  dist[max]>AA  &&  (PX[0]!=Xi  ||  PY[0]!=Yi)  &&  (PX[1]!=Xi  ||
PY[1]!=Yi) &&(PX[2]!=Xi || PY[2]!=Yi)){dist[max]=AA;PX[max]=Xi;PY[max]=Yi;}//if
```

```
                }// for row
              }// for max
// now we have the closest 4 points PX[] PY[] dist[] to the point XX,YY
              // now find the middle valuse for these 4 points and store it in Mvalue[]
                   for(int  x=0;x<4;x++){
                      MaxMin[x][0]=-30000;
                      MaxMin[x][1]=30000;
                   }
               // this is the first line of the output

jTextArea4.setText(jTextArea4.getText()+"\n===============\n"+jLabel9.getText()+"       point:
X="+ XX+" Y="+YY);
              jTextArea4.setText(jTextArea4.getText()+"\nThe 4 closest points are:");
              for( int x=0;x<4;x++){

                for( int row=1;row < d[mark-1][0][0]+1;row++){
                  if(PX[x]== d[mark-1][row][1]  &&   PY[x]== d[mark-1][row][2]){
                     double total=0;
                     for( int col=3;col<d[mark-1][row][0]+1;col++){
                       if(MaxMin[x][0]<d[mark-1][row][col])MaxMin[x][0]=d[mark-1][row][col];
                       if(MaxMin[x][1]>d[mark-1][row][col])MaxMin[x][1]=d[mark-1][row][col];
                      total=total+d[mark-1][row][col];
                      }
                       Mvalue[x]= total/(d[mark-1][row][0]-2);
                   }// if
                 }// for row
                jTextArea4.setText(jTextArea4.getText()+"\n\n     Point     "+(x+1)+"     X="+PX[x]+"
Y="+PY[x] );
                jTextArea4.setText(jTextArea4.getText()+"\n                    MaxVal="+MaxMin[x][0]+"
MinVal="+MaxMin[x][1] );
                jTextArea4.setText(jTextArea4.getText()+"\n                       Mean="+Mvalue[x]+"\n
distance="+dist[x] );
                 // now deviding the real data into 5 zones
                 Zone1=Zone2=Zone3=Zone4=Zone5=0;
                border1=(float)MaxMin[x][1];
                border2=(float)MaxMin[x][1]+1.0*((float)(MaxMin[x][0]-MaxMin[x][1])/5.0 ) ;
                border3=(float)MaxMin[x][1]+2.0*((float)(MaxMin[x][0]-MaxMin[x][1])/5.0 ) ;
                border4=(float)MaxMin[x][1]+3.0*((float)(MaxMin[x][0]-MaxMin[x][1])/5.0 ) ;
                border5=(float)MaxMin[x][1]+4.0*((float)(MaxMin[x][0]-MaxMin[x][1])/5.0 ) ;
                border6=(float)MaxMin[x][0];
                 for(  int row=1;row < d[mark-1][0][0]+1;row++){
                   if(PX[x]== d[mark-1][row][1]  &&   PY[x]== d[mark-1][row][2]){
                     for(int  col=3;col<d[mark-1][row][0]+1;col++){
                      if(   (float)d[mark-1][row][col]>=border1   &&   (float)d[mark-1][row][col]<border2
)Zone1=Zone1+1.0;
                      if(   (float)d[mark-1][row][col]>=border2   &&   (float)d[mark-1][row][col]<border3)
Zone2=Zone2+1.0;
                      if(   (float)d[mark-1][row][col]>=border3   &&   (float)d[mark-1][row][col]<border4)
Zone3=Zone3+1.0;
                      if(   (float)d[mark-1][row][col]>=border4   &&   (float)d[mark-1][row][col]<border5)
Zone4=Zone4+1.0;
                      if(  (float)d[mark-1][row][col]>=border5  &&  (float)d[mark-1][row][col]<=border6)
Zone5=Zone5+1.0;
                     }
                   }
                 }
```

```
                Sum=Zone1+Zone2+Zone3+Zone4+Zone5;
                Zone1=(Zone1/Sum)*100.0;
                Zone2=(Zone2/Sum)*100.0;
                Zone3=(Zone3/Sum)*100.0;
                Zone4=(Zone4/Sum)*100.0;
                Zone5=(Zone5/Sum)*100.0;
              // ready to output the data
              jTextArea4.setText(jTextArea4.getText()+"\n Zone 1 ("+ border1+ "-"+ border2 +")
="+ Zone1+"%");
              jTextArea4.setText(jTextArea4.getText()+"\n Zone 2 ("+ border2+"-"+border3+") ="+
Zone2+"%");
              jTextArea4.setText(jTextArea4.getText()+"\n Zone 3 ("+ border3+"-"+border4+") ="+
Zone3+"%");
              jTextArea4.setText(jTextArea4.getText()+"\n Zone 4 ("+ border4+"-"+border5+") ="+
Zone4+"%");
              jTextArea4.setText(jTextArea4.getText()+"\n Zone 5 ("+ border5+"-"+border6+") ="+
Zone5+"%");
              }// for x
              jTextArea4.setText(jTextArea4.getText()+"\n==========");
              // call function for point approximation
              // point_value(.....)
 // now we have PX[] PY[] dist[] and Mvalue[]..... initialize points[4] and iterations start
               iteration(XX,YY);// this will do the job with iterations
               double ResultData=0;
               if (Raster==0)ResultData= Mvalue[0];
               if (Raster==1)ResultData= ((Mvalue[0]+Mvalue[1])/2.0);
               if (Raster==2)ResultData= ((Mvalue[0]+Mvalue[1]+Mvalue[2])/3.0);
               if (Raster==3)ResultData= ((Mvalue[0]+Mvalue[1]+Mvalue[2]+Mvalue[3])/4.0);
               if ( Raster==4){
                  iteration(XX,YY);
                   ResultData= ((points4[0][0]+points4[1][0])/2.0);
                        }
               if ( Raster==5){
                  iteration(XX,YY);
                   ResultData= ((points4[0][0]+points4[1][0]+points4[2][0])/3.0);
                        }
               if ( Raster==6){
                  iteration(XX,YY);
                   ResultData= ((points4[0][0]+points4[1][0]+points4[2][0]+points4[3][0])/4.0);
                        }
                jTextArea4.setText(jTextArea4.getText()+"\n Approx. value is:"+ ResultData);
   }// end else if the point is from the data
 }// end action1()
void iteration(int XX, int YY){// this will iterate using points4[][] and using
              double minV=10000; double maxV=0;
              int Iterations=0;
              // we have to initialyse the points[][] with PX[] PY[]
              // our points are in PX[3] PY[3]
                        for( int t=0;t<4;t++){
                              points4[t][0]= Mvalue[t];
                              points4[t][1]=(float)PX[t];
                              points4[t][2]=(float)PY[t];
                        }
                   double round=    Double.valueOf(jTextField9.getText().trim()).doubleValue();
          while( Math.abs(maxV-minV)>round && Iterations <10 ){
                        Iterations++;
```

```
// Raster == control wish method is choosen into the spline function

                if(Raster==6){// 4 points
                    // if (Iterations<100){
                  //                System.out.print("\n  Iteration:"+Iterations+"  difference="+(maxV-
minV)+"\n");
                     // call point value to calculate new points4[][]

median_value(points4[0][1],points4[0][2],points4[0][0],points4[1][1],points4[1][2],points4[1][0],(float
) XX,(float) YY);
                     //System.out.print("\nThe  new  point  is  X="+value_pos[1]+"
Y="+value_pos[2]+" value="+value_pos[0]);
                    for(int  sta=0;sta<3;sta++)  points4[0][sta]=value_pos[sta];// this collecting the
data from value_pos[3] into points[][]

median_value(points4[1][1],points4[1][2],points4[1][0],points4[2][1],points4[2][2],points4[2][0],(float
) XX,(float) YY);
                     //System.out.print("\nThe  new  point  is  X="+value_pos[1]+"
Y="+value_pos[2]+" value="+value_pos[0]);
                    for(int sta=0;sta<3;sta++) points4[1][sta]=value_pos[sta];

median_value(points4[2][1],points4[2][2],points4[2][0],points4[3][1],points4[3][2],points4[3][0],(float
) XX,(float) YY);
                     //    System.out.print("\nThe  new  point  is  X="+value_pos[1]+"
Y="+value_pos[2]+" value="+value_pos[0]);
                    for(int  sta=0;sta<3;sta++) points4[2][sta]=value_pos[sta];

median_value(points4[3][1],points4[3][2],points4[3][0],points4[0][1],points4[0][2],points4[0][0],(float
) XX,(float) YY);
                     //    System.out.print("\nThe  new  point  is  X="+value_pos[1]+"
Y="+value_pos[2]+" value="+value_pos[0]);
                    for(int sta=0;sta<3;sta++) points4[3][sta]=value_pos[sta];
                        // calculate new values for maxV and min V for all 4 new points values
                            minV=10000,maxV=0;
                            for( int x=0;x<4;x++){
                                  if(maxV<points4[x][0])maxV=points4[x][0];
                                  if(minV>points4[x][0])minV=points4[x][0];
                            }// for x
                     // }
                     //  else {maxV=0;minV=0;}
                }
                  if(Raster==5){// 3 points

median_value(points4[0][1],points4[0][2],points4[0][0],points4[1][1],points4[1][2],points4[1][0],(float
) XX,(float) YY);
                          for(int sta=0;sta<3;sta++) points4[0][sta]=value_pos[sta];

median_value(points4[1][1],points4[1][2],points4[1][0],points4[2][1],points4[2][2],points4[2][0],(float
) XX,(float) YY);
                          for(int sta=0;sta<3;sta++) points4[1][sta]=value_pos[sta] ;

median_value(points4[2][1],points4[2][2],points4[2][0],points4[0][1],points4[0][2],points4[0][0],(float
) XX,(float) YY);
                         for(int sta=0;sta<3;sta++) points4[2][sta]=value_pos[sta] ;

                         minV=10000;maxV=0;
```

```
                    for( int x=0;x<3;x++){
                        if(maxV<points4[x][0])maxV=points4[x][0];
                        if(minV>points4[x][0])minV=points4[x][0];
                    }// for x
                }
                if (Raster==4){// 2 points

median_value(points4[0][1],points4[0][2],points4[0][0],points4[1][1],points4[1][2],points4[1][0],(float
) XX,(float) YY);
                    for(int sta=0;sta<3;sta++) points4[0][sta]=value_pos[sta];

                    minV=10000;maxV=0;
                    for( int x=0;x<2;x++){
                        if(maxV<points4[x][0])maxV=points4[x][0];
                        if(minV>points4[x][0])minV=points4[x][0];
                    }// for x
                }
        }// while
            // write the answer on the screen
  }// end iteration
// this must find the the point value having the coordinates and values of existing points
void median_value(double x1, double y1, double value1, double x2, double y2, double value2,
float x, float y)
{
// the most stupid case
if (x1==x && y1==y)     {  value_pos[0]= value1; value_pos[1]= x1; value_pos[2]= y1;}
else if (x2==x && y2==y) {  value_pos[0]= value2; value_pos[1]= x2; value_pos[2]= y2;}
else{
//The functin take 2 points and theyr values and existing target points and calculate value of the
point on the AB line
//depends of the distances
// distances
        double AX = Math.sqrt((x1-x)*(x1-x) + (y1-y)*(y1-y));
        double BX = Math.sqrt((x2-x)*(x2-x) + (y2-y)*(y2-y));
        double AB = Math.sqrt((x1-x2)*(x1-x2) + (y1-y2)*(y1-y2));
        // Find Unit
        double Unit = AB/(AX+BX);
        double AC=AX*Unit;
        double BC=BX*Unit;// C is the point on the line AB
                //calculate the interpolation value of the point
                double  Shift_val= Math.min(value1,value2);
                if(value1>value2)       value_pos[0]=   (((value1-Shift_val)*BX)/(AX+BX))   +
Shift_val;
                else  value_pos[0]= (((value2-Shift_val)*AX)/(AX+BX)) + Shift_val;
                 // now the position
                 if((y2-y1)==0.0 || (x2-x1)==0.0){
                        if ((y2-y1)==0.0) {
                            value_pos[2]=y1;
                            if(x1>x2)  value_pos[1]=x1-AC;
                            else       value_pos[1]=x2-BC;
                                }
                        if ((x2-x1)==0.0) {
                            value_pos[1]=x1;
                            if (y1>y2) value_pos[2]=y1-AC;
                            else       value_pos[2]=y2-BC,
                                }
```

```
                        }
                        else        {
                                    value_pos[2]= ((AC/AB)*(y2-y1))+y1;
                                    value_pos[1]= ((value_pos[2]-y1)/(y2-y1))*(x2-x1)+x1;
                                   }
 //System.out.print("\n===============\n X1="+x1+" Y1="+y1+" value1="+value1);
// System.out.print ("\n X2="+x2+" Y2="+y2+" value2="+value2);
 //System.out.print ("\n points X coordinated X="+x+" Y="+y);
// System.out.print ("\n result: X="+value_pos[1]+" Y="+value_pos[2]+" value="+value_pos[0]);
   }// the big else
}// end medien value
// this is slyne button
  void jButton3_actionPerformed(ActionEvent e) {
          if(jRadioButton1.isSelected()) mark=1;// what device we select in radio buttons
          if(jRadioButton2.isSelected()) mark=2;
          if(jRadioButton3.isSelected()) mark=3;
          if(jRadioButton4.isSelected()) mark=4;
          if(jRadioButton5.isSelected()) mark=5;
//System.out.print(" This is spline operation:");

// lets find the mastab variable for the slab

              int  maxX=0; int maxY=0;
              for(int x=1;x<d[mark-1][0][0]+1;x++){
              if(d[mark-1][x][1]>maxX) maxX=d[mark-1][x][1];
              if(d[mark-1][x][2]>maxY) maxY=d[mark-1][x][2];
             //  System.out.print(d[mark-1][x][1]+"\n");
              }// for
              // System.out.print("maxX="+maxX +" maxY="+maxY);
              if(maxX > maxY) mastab= (float)200.0/(float)maxX;
              else mastab= (float)200.0/(float)maxY;
 ////////////////////mastab is found
// do we have everyting for doiteration method: mastab,mark,Raster
doiterations(mastab,mark);// this will iterate in mastab and mark device into graph[][] for each
point 200/200
// now output on the screen
// 1 find max and min values into the graph[][]
General_sw=1;
jPanel10.repaint();
 }// end splyne
 void doiterations(float mastab_input, int mark_table){
              int XX,YY;
              // passing all the points
               for( int XXX=1;XXX<201;XXX++){
                 for( int YYY=1;YYY<201;YYY++){
              // coordinates transformation
                   XX=(int)((float)XXX/mastab_input);
                   YY=(int)((float)YYY/mastab_input);
              //System.out.print("\n Real coordinates:XX="+XX+" YY="+YY+" virtual XXX="+XXX+"
YYY="+YYY+"\n");
              // check the value of x,y mait exists
                        int control_point=-1;
                        for( int row=1;row < d[mark_table-1][0][0]+1;row++){
                            if      (XX==     d[mark_table-1][row][1]  &&  YY==  d[mark_table-
1][row][2])control_point=row,
                        }
```

```
// if exists just tranfere the value
                if (control_point>-1){
                        int row=control_point;
                        // find the mddle value and assigne to graph[][]
                        double total=0;
                          for(int  col=3;col<d[mark_table-1][row][0]+1;col++){
                          total=total+d[mark_table-1][row][col];
                          }
                        graph[XXX][YYY]= total/(d[mark_table-1][row][0]-2);

                }// if
                // if not exists start algorithm to find the value from 4 points
                else{// control_point is not >-1
                      for(int x=0;x<4;x++){
                            dist[x]= 300000;
                            PX[x]=0;PY[x]=0;
                            }
                     // find the 4 closest points and store the data in PX[]PY[] and keep dist[]
                      for(int  max=0;max<4;max++){
                         for(int  row=1;row < d[mark_table-1][0][0]+1;row++){
                          int  Xi=  d[mark_table-1][row][1] ;
                          int  Yi=  d[mark_table-1][row][2] ;
                        double AA =  Math.sqrt ((XX-Xi)*(XX-Xi)+(YY-Yi)*(YY-Yi));
                          if (max==0 && dist[max]>AA) {dist[max]=AA;PX[max]=Xi;PY[max]=Yi;}
                          if (max==1 && dist[max]>AA && (PX[0]!=Xi || PY[0]!=Yi)){ dist[max]=AA; PX[max]=Xi; PY[max]=Yi;}
                          if (max==2 && dist[max]>AA && (PX[0]!=Xi || PY[0]!=Yi) && (PX[1]!=Xi || PY[1]!=Yi)) {dist[max]=AA;PX[max]=Xi;PY[max]=Yi;}
                          if (max==3 && dist[max]>AA && (PX[0]!=Xi || PY[0]!=Yi) && (PX[1]!=Xi || PY[1]!=Yi) &&(PX[2]!=Xi || PY[2]!=Yi)) {dist[max]=AA;PX[max]=Xi;PY[max]=Yi;}
                        }// for max
                      }// for row
                // now having PX[]PY[] store Mvalue[]
                      for(int  x=0;x<4;x++){
                        for( int  row=1;row < d[mark_table-1][0][0]+1;row++){
                          if(PX[x]==  d[mark_table-1][row][1]  &&  PY[x]==  d[mark_table-1][row][2]){
                             double total=0;
                             for(int  col=3;col<d[mark_table-1][row][0]+1;col++){
                              total=total+d[mark_table-1][row][col];
                              }
                               Mvalue[x]= total/(d[mark_table-1][row][0]-2);
                           }// if
                        }// for row
                      }// for x
                //System.out.print("\n just calculate the 4 points");
                //for(x=0;x<4;x++)  System.out.print("\n  point  "+x+"  X="+PX[x]+"  Y="+PY[x]+" value="+Mvalue[x]);
                // now extract from PX[]PY[]Mvalue[] the data and store them in points4[4][3]:0-the value 1-X 2-Y
                      // if (jCheckBox1.isSelected()) {
                      if ( Raster==0)graph[XXX][YYY]= Mvalue[0];
                      if ( Raster==1)graph[XXX][YYY]= ((Mvalue[0]+Mvalue[1])/2.0);
                      if  (  Raster==2)graph[XXX][YYY]= ((Mvalue[0]+Mvalue[1]+Mvalue[2])/3.0);
```

```
                                if                    (                    Raster==3)graph[XXX][YYY]=
((Mvalue[0]+Mvalue[1]+Mvalue[2]+Mvalue[3])/4.0);
                                if ( Raster==4){
                                   iteration(XX,YY);
                                    graph[XXX][YYY]= ((points4[0][0]+points4[1][0])/2.0);
                                          }
                                if ( Raster==5){
                                   iteration(XX,YY);
                                    graph[XXX][YYY]= ((points4[0][0]+points4[1][0]+points4[2][0])/3.0);
                                          }
                                if ( Raster==6){
                                   iteration(XX,YY);
                                    graph[XXX][YYY]=
((points4[0][0]+points4[1][0]+points4[2][0]+points4[3][0])/4.0);
                                          }
                           } //else control point
                  //System.out.print("\n point X="+XXX+" Y="+YYY+" value="+  graph[XXX][YYY]);
                  // graph[XXX][YYY]= XXX+YYY;
                     }// YYY
                   }// XXX
 }// do iterations
  void jButton7_actionPerformed(ActionEvent e) {// this is the button clear
  General_sw=0;
jPanel10.repaint();
  }
  void jPanel13_mouseClicked(MouseEvent e) {// if we clicked in concrete graphical panel
  // 1. calculate the mastab -- ha this is public
double data;// % of the data participation
// now the real coordinates
jTextArea5.setText(jTextArea5.getText()+ "\n Concrete graph measurement ");
jTextArea5.setText(jTextArea5.getText()+                    "                    point
X="+Integer.toString((int)((float)e.getX()/mastab_all_devices)));
jTextArea5.setText(jTextArea5.getText()+                                                    "
Y="+Integer.toString((int)((float)e.getY()/mastab_all_devices)));
data=(dev_graph[1][e.getX()][e.getY()]*100.0)/(dev_graph[1][e.getX()][e.getY()]+dev_graph[2][e.g
etX()][e.getY()]);
jTextArea5.setText(jTextArea5.getText()+ "\n Shmith-hammer data:  "+ data +" %");
jTextArea5.setText(jTextArea5.getText()+ " weight: "+jTextField2.getText());
data=(dev_graph[2][e.getX()][e.getY()]*100.0)/(dev_graph[1][e.getX()][e.getY()]+dev_graph[2][e.g
etX()][e.getY()]);
jTextArea5.setText(jTextArea5.getText()+ "\n     Covermether(C):  "+ data +" %" );
jTextArea5.setText(jTextArea5.getText()+ " weight: "+jTextField3.getText());
jTextArea5.setText(jTextArea5.getText()+ "\n");
  }
  void jPanel11_mouseClicked(MouseEvent e) {// we click in steel graphical panel
double data;
jTextArea5.setText(jTextArea5.getText()+ "\n Steel graph measurement ");
jTextArea5.setText(jTextArea5.getText()+                    "                    point
X="+Integer.toString((int)((float)e.getX()/mastab_all_devices)));
jTextArea5.setText(jTextArea5.getText()+                                                    "
Y="+Integer.toString((int)((float)e.getY()/mastab_all_devices)));
data=(dev_graph[3][e.getX()][e.getY()]*100.0)/(dev_graph[3][e.getX()][e.getY()]+dev_graph[4][e.g
etX()][e.getY()]+ dev_graph[5][e.getX()][e.getY()]);
jTextArea5.setText(jTextArea5.getText()+ "\n Covermether(S):  "+data+" %");
jTextArea5.setText(jTextArea5.getText()+ " weight: "+jTextField4.getText());
```

```
data=(dev_graph[4][e.getX()][e.getY()]*100.0)/(dev_graph[3][e.getX()][e.getY()]+dev_graph[4][e.g
etX()][e.getY()]+dev_graph[5][e.getX()][e.getY()]);
jTextArea5.setText(jTextArea5.getText()+ "\n      Half_Cell:  "+data+" %");
jTextArea5.setText(jTextArea5.getText()+ " weight: "+jTextField5.getText());
data=(dev_graph[5][e.getX()][e.getY()]*100.0)/(dev_graph[3][e.getX()][e.getY()]+dev_graph[4][e.g
etX()][e.getY()]+dev_graph[5][e.getX()][e.getY()]);
jTextArea5.setText(jTextArea5.getText()+ "\n    Resistivity:  "+data+" %");
jTextArea5.setText(jTextArea5.getText()+ " weight: "+jTextField6.getText());
jTextArea5.setText(jTextArea5.getText()+ "\n");
 }
 void jPanel12_mouseClicked(MouseEvent e) {// we click in total panel
 double data; double devide= dev_graph[1][e.getX()][e.getY()]+dev_graph[2][e.getX()][e.getY()]+
dev_graph[3][e.getX()][e.getY()]+dev_graph[4][e.getX()][e.getY()]+dev_graph[5][e.getX()][e.getY()
];
jTextArea5.setText(jTextArea5.getText()+ "\n Total graph measurement ");
jTextArea5.setText(jTextArea5.getText()+                                    "                                    point
X="+Integer.toString((int)((float)e.getX()/mastab_all_devices)));
jTextArea5.setText(jTextArea5.getText()+                                                                        "
Y="+Integer.toString((int)((float)e.getY()/mastab_all_devices)));
data= dev_graph[1][e.getX()][e.getY()]*100/devide;
jTextArea5.setText(jTextArea5.getText()+ "\n  Shmith-hammer:  "+data+" %");
jTextArea5.setText(jTextArea5.getText()+ " weight: "+jTextField2.getText());
data= dev_graph[2][e.getX()][e.getY()]*100/devide;
jTextArea5.setText(jTextArea5.getText()+ "\n Covermether(C):  "+data+" %");
jTextArea5.setText(jTextArea5.getText()+ " weight: "+jTextField3.getText());
data= dev_graph[3][e.getX()][e.getY()]*100/devide;
jTextArea5.setText(jTextArea5.getText()+ "\n Covermether(S):  "+data+" %");
jTextArea5.setText(jTextArea5.getText()+ " weight: "+jTextField4.getText());
data= dev_graph[4][e.getX()][e.getY()]*100/devide;
jTextArea5.setText(jTextArea5.getText()+ "\n      Half_Cell:  "+data+" %");
jTextArea5.setText(jTextArea5.getText()+ " weight: "+jTextField5.getText());
data= dev_graph[5][e.getX()][e.getY()]*100/devide;
jTextArea5.setText(jTextArea5.getText()+ "\n    Resistivity:  "+data+" %");
jTextArea5.setText(jTextArea5.getText()+ " weight: "+jTextField6.getText());
jTextArea5.setText(jTextArea5.getText()+ "\n");
 }
 void jButton8_mouseClicked(MouseEvent e) {// this will update the data we correct and update
d[][]
int Device=0; Count_row=0; Counter=0;String piece=""; String actual="";String mesure;// count
the lines
  java.util.StringTokenizer                                st_line=                                new
java.util.StringTokenizer(jTextArea3.getText().toString(),"\n");// row
  while (st_line.hasMoreTokens()){// this is the line from the text
     Counter++; Count_row=0; boolean Rabish;
     java.util.StringTokenizer st= new java.util.StringTokenizer(st_line.nextToken().toString(),",");
     Rabish=true;
     while(st.hasMoreTokens()){
          pice =  st.nextToken().toString().intern();
         // System.out.print("\n"+pice);
           if(pice.trim()=="Shmith-Hammer".intern()){Device=0;Count_row=0;Counter=0;}
       else if(pice.trim()=="Covermeter(C)".intern()){Device=1;Count_row=0;Counter=0;}
       else if(pice.trim()=="Covermeter(S)".intern()){Device=2;Count_row=0;Counter=0;}
       else if(pice.trim()=="Half Cell".intern()){Device=3;Count_row=0;Counter=0;}
       else if(pice.trim()=="Resistivity".intern()){Device=4;Count_row=0;Counter=0;}
       else if(Rabish){Rabish=false;}// this is the first part we ignored ( will be calculated later)
       else {Count_row++;
```

```
                        if(pice.length()>3){ mesure=(pice.substring(0,3)).intern();
                            if (mesure ==" x=".intern() || mesure ==" y=".intern()) actual=
pice.substring(3).intern();
                        }
                        else                actual= pice intern();
                       d[Device][Counter][Count_row]=Integer.parseInt(actual.trim());//
                       d[Device][Counter][0]= Count_row;
                       d[Device][0][0]=Counter;
          }//else

        }// while
  }// while
       dostatistics();
      jPanel4.repaint();
}
  void jButton4_actionPerformed(ActionEvent e) {// big SD button
  //This id SD statistics according to the output requirements !
jTextArea6.setText(jTextArea6.getText()+"\n-------- STANDART DEVIATION--------\n");
int Device,NumberPoints,Measurements,MaxVal,MinVal;
double MidVal,TotalVal;
double SD=0;
  // global analysis
// Just for this case we have to initialise
double SD_Big=0; int Dev_Big_SD=0;

for ( Device=0;Device<5;Device++){
          if (d[Device][0][0]>0){
                    Measurements=0;TotalVal=0;
              for(int x=1 ;x<d[Device][0][0]+1;x++){
                Measurements=Measurements+(d[Device][x][0]-2);
                 for(int y=3;y<d[Device][x][0]+1;y++){
                  TotalVal=TotalVal+d[Device][x][y];
                 }
                }// for

            MidVal= TotalVal/Measurements; SD=0;
                    for(int x=1 ;x<d[Device][0][0]+1;x++){
                      for(int y=3;y<d[Device][x][0]+1;y++){
                      SD=SD+ ((double)d[Device][x][y]-MidVal)*((double)d[Device][x][y]-MidVal);
                      }
                    }
  SD=Math.sqrt(SD/(double)(Measurements-1));
   if(SD>SD_Big){SD_Big=SD;Dev_Big_SD=Device;}// now we have the data to output
   jTextArea6.setText(jTextArea6.getText()+"SD in device: "+ Device+ " = "+SD+"\n");
          }// if
}// for device
 jTextArea6.setText(jTextArea6.getText()+"----------------------\n");
 jTextArea6.setText(jTextArea6.getText()+"Big strandart dev in device:"+ Dev_Big_SD+ " =
"+SD_Big+"\n");
  }
  void jButton5_actionPerformed(ActionEvent e) {// max/min button
  jTextArea6.setText( jTextArea6.getText()+"\n ------MAX/MIN------- ");
  // max min value
 int x; int MaxVal,MinVal;
for(int Device=0;Device<5;Device++){
 if(d[Device][0][0]>0){
```

```
    jTextArea6.setText( jTextArea6.getText()+"\n Device "+Device);
    for ( x=1;x<d[Device][0][0]+1;x++){

              MaxVal=-34565;MinVal=34500;
                    for(int y=3;y<d[Device][x][0]+1;y++){
                    if(MaxVal<d[Device][x][y])MaxVal=d[Device][x][y];
                    if(MinVal>d[Device][x][y])MinVal=d[Device][x][y];
                    }//y
    jTextArea6.setText( jTextArea6.getText()+"\n"+x+" Max = "+MaxVal+ " Min = "+MinVal);
    }
   jTextArea6.setText( jTextArea6.getText()+"\n ----------------");
  }// if
}// for
  }
  void jButton9_actionPerformed(ActionEvent e) { // trust button
 jTextArea6.setText( jTextArea6.getText()+"\n ----WEIGHT----");
 jTextArea6.setText( jTextArea6.getText()+"\n Device  weight");
 jTextArea6.setText( jTextArea6.getText()+"\n 0     "+ jTextField2.getText());
 jTextArea6.setText( jTextArea6.getText()+"\n 1     "+ jTextField3.getText());
 jTextArea6.setText( jTextArea6.getText()+"\n 2     "+ jTextField4.getText());
 jTextArea6.setText( jTextArea6.getText()+"\n 3     "+ jTextField5.getText());
 jTextArea6.setText( jTextArea6.getText()+"\n 4     "+ jTextField6.getText());
  }
  void jButton10_actionPerformed(ActionEvent e) {// Irelevant data button
// irelevamt data
// Here we paste the data for eash point for eash measurement in the text field
 int x;double TotalVal,MidVal; int Measurements; double SD;double coeff_SD;
 coeff_SD=Double.valueOf(jTextField11.getText().trim()).doubleValue();
  jTextArea6.setText( jTextArea6.getText()+"\n Irelevant data < > +-("+coeff_SD+" * SD)+mean ");
for( int Device=0;Device<5;Device++){
 if(d[Device][0][0]>0){
    jTextArea6.setText( jTextArea6.getText()+"\n Device "+Device);
    // fin d the sd for the row
    for ( x=1;x<d[Device][0][0]+1,x++){
               Measurements=d[Device][x][0]-2;TotalVal=0;SD=0;
                    for(int y=3;y<d[Device][x][0]+1;y++){
                     TotalVal=TotalVal+d[Device][x][y];
                    }//y
              MidVal= TotalVal/Measurements;
                   for(int y=3;y<d[Device][x][0]+1;y++){
                    SD=SD+ ((double)d[Device][x][y]-MidVal)*((double)d[Device][x][y]-MidVal);
                   }//y
              SD=Math.sqrt(SD/(double)(Measurements-1));// this is the value we need for row
         // for row y we have SD and Mid Val
                  for(int y=3;y<d[Device][x][0]+1;y++){
                      if        (((double)d[Device][x][y])>        (MidVal+SD*coeff_SD)        ||
((double)d[Device][x][y])< (MidVal-SD*coeff_SD)){
                      jTextArea6.setText( jTextArea6.getText()+"\n"+ x+" x= "+d[Device][x][1]+"
y= "+d[Device][x][1]+ " ("+d[Device][x][y]+") mid="+MidVal+" SD="+SD+" dev. from mean:"+
Math.abs(MidVal-d[Device][x][y]));
                      }
                  }//y
  }// for x
  }// if
}// for device
  }
```

```
 void jButton11_actionPerformed(ActionEvent e) {// show the low zones in graphical format
 // this describe the problem and low zones in the graphics information
 // first find the mastab
                              int  maxX=0; int maxY=0;
                                for( int m=1;m<6;m++){
                                   for(int x=1;x<d[m-1][0][0]+1;x++){
                                        if(d[m-1][x][1]>maxX) maxX=d[m-1][x][1];
                                        if(d[m-1][x][2]>maxY) maxY=d[m-1][x][2];
                                    }// for
                                  }// for m

                                 // System.out.print("maxX="+maxX +" maxY="+maxY);
                                 if(maxX > maxY) mastab_all_devices= (float)200.0/(float)maxX;
                                 else mastab_all_devices= (float)200.0/(float)maxY;
// just to be shure we are initializing
for(int Device= 0 ;Device<5;Device++){
 if (d[Device][0][0]==0){
            for( int x= 1;x<201;x++){
               for (int y=1;y<201;y++){
                  dev_graph[Device+1][x][y]=0.0;
               }
              }
}

}

 jTextArea6.setText( jTextArea6.getText()+"\n Graphics mix information");
       double Min1=34000;double Max1=0;int x1max=0,y1max=0,x1min=0,y1min=0;
       double Min2=34000;double Max2=0;int x2max=0,y2max=0,x2min=0,y2min=0;
       double Min3=34000;double Max3=0;int x3max=0,y3max=0,x3min=0,y3min=0;
       for( int x= 1;x<201;x++){
          for (int y=1;y<201;y++){
            if                              (dev_graph[1][x][y]+dev_graph[2][x][y]                          <
Min1){Min1=dev_graph[1][x][y]+dev_graph[2][x][y];x1min=x;y1min=y;}
            if                              (dev_graph[1][x][y]+dev_graph[2][x][y]                          >
Max1){Max1=dev_graph[1][x][y]+dev_graph[2][x][y];x1max=x;y1max=y;}
            if                  (dev_graph[3][x][y]+dev_graph[4][x][y]+dev_graph[5][x][y]                   <
Min2){Min2=dev_graph[3][x][y]+dev_graph[4][x][y]+dev_graph[5][x][y];x2min=x;y2min=y;}
            if                  (dev_graph[3][x][y]+dev_graph[4][x][y]+dev_graph[5][x][y]                   >
Max2){Max2=dev_graph[3][x][y]+dev_graph[4][x][y]+dev_graph[5][x][y];x2max=x;y2max=y;}
            if
(dev_graph[1][x][y]+dev_graph[2][x][y]+dev_graph[3][x][y]+dev_graph[4][x][y]+dev_graph[5][x][y]
<
Min3){Min3=dev_graph[1][x][y]+dev_graph[2][x][y]+dev_graph[3][x][y]+dev_graph[4][x][y]+dev_gr
aph[5][x][y];;x3min=x;y3min=y;}
            if
(dev_graph[1][x][y]+dev_graph[2][x][y]+dev_graph[3][x][y]+dev_graph[4][x][y]+dev_graph[5][x][y]
>
Max3){Max3=dev_graph[1][x][y]+dev_graph[2][x][y]+dev_graph[3][x][y]+dev_graph[4][x][y]+dev_g
raph[5][x][y];x3max=x;y3max=y;}
          }// for
       }// for
             // now we have the data and has to be outputed
              jTextArea6.setText( jTextArea6.getText()+"\n Concrete ");
              jTextArea6.setText( jTextArea6.getText()+"\nmax in x="+x1max/mastab_all_devices+"
y="+y1max/mastab_all_devices+",");
```

```
            jTextArea6.setText( jTextArea6.getText()+"\nmin in x="+x1min/mastab_all_devices+"
y="+y1min/mastab_all_devices+",");
             // now for steel
              jTextArea6.setText( jTextArea6.getText()+"\n Steel ");
              jTextArea6 setText(                    jTextArea6.getText()+"\nmax                    in
x="+x2max/mastab_all_devices+" y="+y2max/mastab_all_devices+",");
              jTextArea6.setText( jTextArea6.getText()+"\nmin in x="+x2min/mastab_all_devices+"
y="+y2min/mastab_all_devices+",");
            // now total
            jTextArea6.setText( jTextArea6.getText()+"\n Total ");
            jTextArea6.setText( jTextArea6.getText()+"\nmax in x="+x3max/mastab_all_devices+"
y="+y3max/mastab_all_devices+",");
           jTextArea6.setText( jTextArea6.getText()+"\nmin in x="+x3min/mastab_all_devices+"
y="+y3min/mastab_all_devices+",");

  }

  void jButton1_mouseClicked(MouseEvent e) {
//System.out.print("HELP");
              MyFrame.setSize(410,340);
              // open the help file if exists
               try{
                    BufferedReader help= new BufferedReader(new FileReader("help.txt"));
                    String line ;
                    MyFrame.jTextPane1.setText("");
                     while( (line = help.readLine())!=null){
                       MyFrame.jTextPane1.setText(MyFrame.jTextPane1.getText()+      "\n"+line);//
read the file in jTextArea1
                        }
                      help.close();
                   }
                  catch (IOException f){
                     jLabel1_general_info.setText("Problem in loadding");
                   }
////////////////////////////////////////////////////
              MyFrame.show();
  }
  void jButton12_actionPerformed(ActionEvent e) {
// the file is saved in current directory
     try{
          //File f = new File("TestData.config");
             File f = new File(jTextField12.getText()+".txt");
             String line;
              PrintWriter out = new PrintWriter(new FileWriter(f));
              out.println(jTextPane2.getText());
              out.close();
              jLabel1_general_info.setText("new file saved:"+ jTextField12.getText()+".txt");
        }
     catch (IOException aq){
          jLabel1_general_info.setText("Save problem");
        }
  }
}// Frame 1
```

==========

Frame 2 code

```
package ziad;
import java.awt.*;
import com.borland.jbcl.layout.*;
import javax.swing.*;
public class Frame2 extends JFrame {
  XYLayout xYLayout1 = new XYLayout();
  JScrollPane jScrollPane1 = new JScrollPane();
  JTextPane jTextPane1 = new JTextPane();
  public Frame2() {
    try {
      jbInit();
    }
    catch(Exception e) {
      e.printStackTrace();
    }
  }
  private void jbInit() throws Exception {
    this.getContentPane().setLayout(xYLayout1);
    jTextPane1.setEditable(false);
    jTextPane1.setText("Loading HELP.TXT file");
    this.setTitle("system help");
    this.getContentPane().add(jScrollPane1,  new XYConstraints(4, 30, 394, 268));
    jScrollPane1.getViewport().add(jTextPane1, null);
  }
}
```

==========