

dist_obs

```
% dist_obs.m 15-nov-2011
```

```
X=[200;400;200;802];  
Y=[1100;890;330;1000];  
l=[610.1;417.0;900.5];
```

```
sig=0.2;  
sig0=0.2;  
W=eye(3);
```

```
n=3;  
n0=2;  
r=1;  
c=3;  
u=2;
```

```
for iter=1:4  
    B=zeros(c,u);  
    f=zeros(c,1);  
    [CompD F dFdxi dFdyi dFdxj dFdyj]=distance2d(l(1),1,4,X,Y);  
    B(1,:)=[dFdxj dFdyj];  
    f(1)=-F;  
    [CompD F dFdxi dFdyi dFdxj dFdyj]=distance2d(l(2),2,4,X,Y);  
    B(2,:)=[dFdxj dFdyj];  
    f(2)=-F;  
    [CompD F dFdxi dFdyi dFdxj dFdyj]=distance2d(l(3),3,4,X,Y);  
    B(3,:)=[dFdxj dFdyj];  
    f(3)=-F;  
    N=B'*B;  
    t=B'*f;  
    del=inv(N)*t  
    X(4)=X(4)+del(1);  
    Y(4)=Y(4)+del(2);  
end
```

```
[X(4) Y(4)]  
v=f - B*del
```

```
dist_obs
del =
    -0.0037892112069677
    -0.125421173307948
del =
    9.7105934476547e-006
    -6.41295215918367e-005
del =
    1.30214508536592e-008
    -3.83760710572583e-008
del =
    8.0623086870039e-012
    -2.47645608613591e-011
ans =
    801.996220512416
    999.87451465877
v =
    0.165976706919388
    -0.258629030225509
    0.12828897417812
diary off
```

simcon2

```

% simcon2.m 15-nov-2011
% ok now enforce the constraint

X=[200;400;200;802];
Y=[1100;890;330;1000];
l=[610.1;417.0;900.5];

sig=0.2;
sig0=0.2;
W=eye(3);

n=3;
n0=1;
r=2;
c=3;
s=1;
u=2;
% c+s=r+u ??
% 3+1=2+2 check

for iter=1:4
    B=zeros(c,u);
    f=zeros(c,1);
    [CompD F dFdxj dFdyj]=distance2d(l(1),1,4,X,Y);
    B(1,:)=dFdxj dFdyj;
    f(1)=-F;
    [CompD F dFdxj dFdyj]=distance2d(l(2),2,4,X,Y);
    B(2,:)=dFdxj dFdyj;
    f(2)=-F;
    [CompD F dFdxj dFdyj]=distance2d(l(3),3,4,X,Y);
    B(3,:)=dFdxj dFdyj;
    f(3)=-F;
    N=B'*B;
    t=B'*f;
    Fc=Y(4)-3.33333*X(4) + 1666.667;
    g=-Fc;
    C=[-3.33333 1.000];

    M=[-N C';C 0];
    z=[-t;g];
    del_k=inv(M)*z

    X(4)=X(4)+del_k(1);
    Y(4)=Y(4)+del_k(2);
end

[X(4) Y(4)]
v=f - B*del_k(1:2)
Fc

```

simcon2

simcon2

```
simcon2
del_k =
    -1.38682688975448
     2.04090832357487
     0.591632568391565
del_k =
    0.000441373358698399
     0.0014712430577502
     0.588001194554824
del_k =
    1.60394792004444e-006
     5.34648817493192e-006
     0.587999170946332
del_k =
     5.83025624249333e-009
     1.94337133354217e-008
     0.587999163595013
ans =
    800.613616093382
    1002.04238493255
v =
    -1.55056882249022
    -1.01350331916942
     0.819967038678522
Fc =
    4.54747350886464e-013
diary off
```

unisim

```
% unisim.m.m 15-nov-2011
% unified LS

X=[200;400;200;801];
Y=[1100;890;330;1000];
l=[610.1;417.0;900.5];
origx=X(4);
origy=Y(4);

sig=0.2;
sig0=0.2;
W=eye(3);
sigx=0.05;
Wxx=[sig0^2/sigx^2 0; 0 sig0^2/sigx^2];

n=3;
n0=2;
r=1;
c=3;
u=2;

for iter=1:4
    B=zeros(c,u);
    f=zeros(c,1);
    [CompD F dFdx1 dFdy1 dFdx2 dFdy2]=distance2d(l(1),1,4,X,Y);
    B(1,:)= [dFdx2 dFdy2];
    f(1)=-F;
    [CompD F dFdx1 dFdy1 dFdx2 dFdy2]=distance2d(l(2),2,4,X,Y);
    B(2,:)= [dFdx2 dFdy2];
    f(2)=-F;
    [CompD F dFdx1 dFdy1 dFdx2 dFdy2]=distance2d(l(3),3,4,X,Y);
    B(3,:)= [dFdx2 dFdy2];
    f(3)=-F;
    N=B'*B;
    M=N + Wxx;
    fx=[X(4)-origx; Y(4)-origy];
    t=B'*f;
    z=t - Wxx*fx;
    del=inv(M)*z;
    X(4)=X(4)+del(1);
    Y(4)=Y(4)+del(2);
end

[X(4) Y(4)]
v=f - B*del
```

```
unisisim
del =
    0.122680191269936
    0.0260896096082054
del =
    1.66096913867634e-006
    8.29467820162962e-007
del =
    4.9869762241465e-012
    1.19107145967876e-010
del =
    -2.46998234839357e-014
    -1.19928296840678e-014
ans =
    801.122681852244
    1000.0260904392
v =
    -0.720593365589502
    -1.06112651776513
    -0.342546825019693
diary off
```