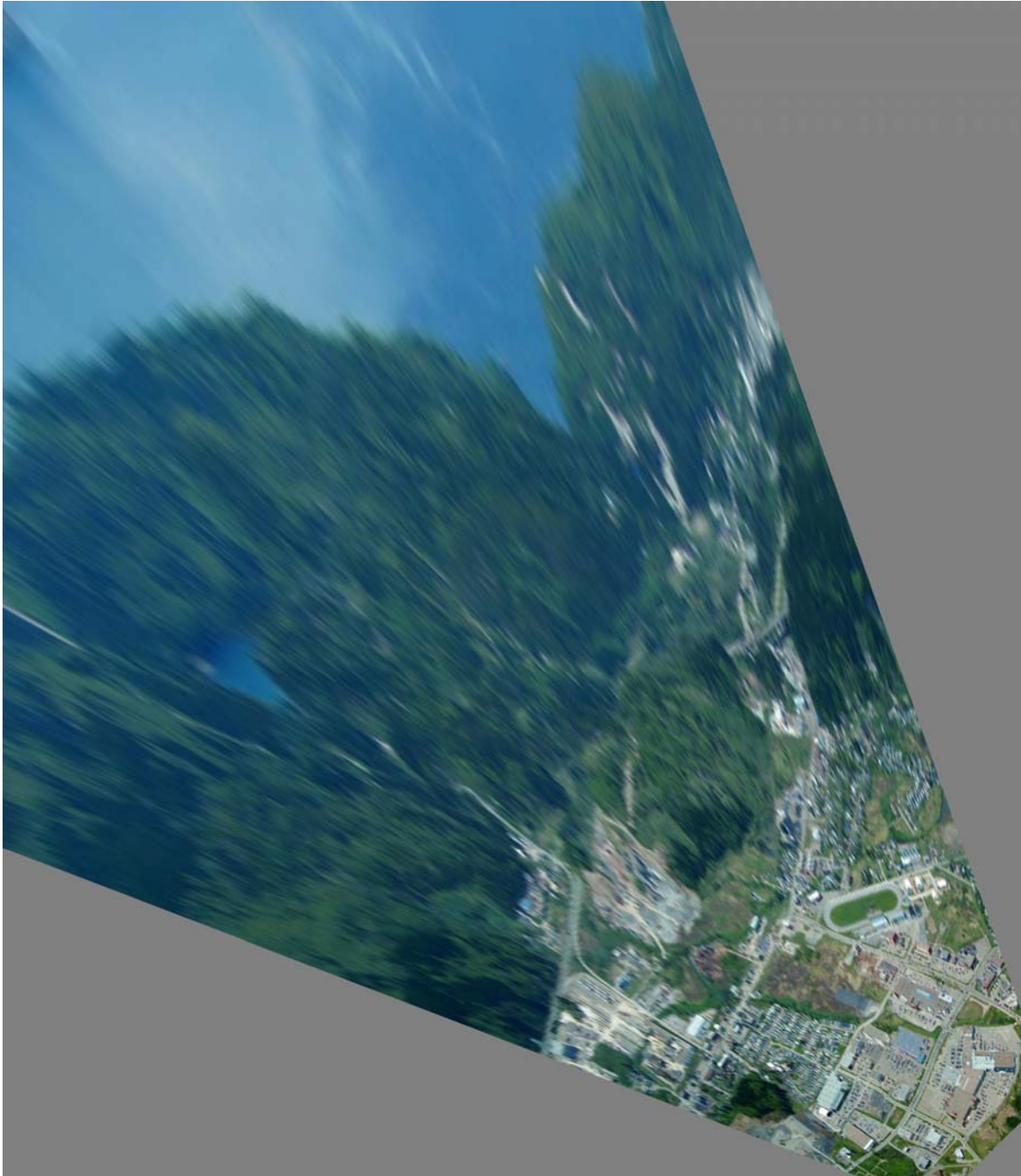


Nearest neighbor
interpolation



Bilinear interpolation

2.5

0

0

-2.5

729500.0

5026300.0

ESRI world file

par8_ls.lst

par8_ls

del =
-12.421
295.17
276.46
93.121
-82.718
82.543
-0.30455
0.31061

residuals: x y

note: these are in image space !!!

| | | |
|----------|-------|-------|
| 1.000000 | 2.41 | -0.19 |
| 2.000000 | 0.95 | 1.07 |
| 3.000000 | 0.15 | 1.07 |
| 4.000000 | -0.09 | -0.54 |
| 5.000000 | -3.39 | -0.71 |
| 6.000000 | 0.83 | 0.53 |
| 7.000000 | -1.34 | -1.36 |
| 8.000000 | 0.48 | 0.13 |

image x, y rms

ans =
1.6179 0.81306

a0 a1 a2 b0 b1 b2 c1 c2

ans =
-12.421 295.17 276.46

ans =
93.121 -82.718 82.543

ans =
-0.30455 0.31061

offsets used to reduce coord magnitude

Xref =
733.01

Yref =
5022.1

crd1_ref =
447

crd2_ref =
340

format long g

par8_ls

del =
-12.4214409629976
295.171791718904
276.455776688616
93.1212276106465
-82.7175574839763
82.5430904885927
-0.304547917683162
0.310606496419191

residuals: x y

note: these are in image space !!!

| | | |
|----------|-------|-------|
| 1.000000 | 2.41 | -0.19 |
| 2.000000 | 0.95 | 1.07 |
| 3.000000 | 0.15 | 1.07 |
| 4.000000 | -0.09 | -0.54 |
| 5.000000 | -3.39 | -0.71 |
| 6.000000 | 0.83 | 0.53 |
| 7.000000 | -1.34 | -1.36 |
| 8.000000 | 0.48 | 0.13 |

image x, y rms

ans =
1.61794554021788

0.813063179892285

| a0 a1 a2 b0 b1 b2 c1 c2 | par8_ls.lst | | |
|--|--------------------|-------------------|------------------|
| ans = | -12.4214409629976 | 295.171791718904 | 276.455776688616 |
| ans = | 93.1212276106465 | -82.7175574839763 | 82.5430904885927 |
| ans = | -0.304547917683162 | 0.310606496419191 | |
| offsets used to reduce coord magnitude | | | |
| Xref = | 733.007 | | |
| Yref = | 5022.107 | | |
| crd1_ref = | | | |
| 447 | | | |
| crd2_ref = | | | |
| 340 | | | |
| diary off | | | |

par8_1 s.m

```

% par8_1 s.m 16-nov-08
% solve 8-parameter problem by least squares
% modify to allow pflag=1: x,y conventional
%                   pflag=2: x,y photoshop
%                   pflag=3  l,s
% data in con2d.dat (control) and
% mea2d.dat (measurements)
% transformation from ground to image with residuals in the
% image system
%
%      a0 + a1*X + a2*Y
% x =  -----
%      1 + c1*X + c2*Y
%
%      b0 + b1*X + b2*Y
% y =  -----
%      1 + c1*X + c2*Y
%
% x=[1 X Y 0 0 0 -xX -xY] [ a0 ]
% y=[0 0 0 1 X Y -yX -yY] [ a1 ]
%                               [ a2 ]
%                               [ b0 ]
%                               [ b1 ]
%                               [ b2 ]
%                               [ c1 ]
%                               [ c2 ]

pflag=2;

degrad=180/pi ;
load con2d.dat
load mea2d.dat

% shift in X&Y only for now
% Xref=con2d(1, 2);
% Yref=con2d(1, 3);

% let's try ground coords in km
Xref=733007/1000;
Yref=5022107/1000;
crd1_ref=447;
crd2_ref=340;

[npts, ndum]=size(con2d);
xpho=zeros(npts, 1);
ypho=zeros(npts, 1);

B=zeros(2*npts, 8);
f=zeros(2*npts, 1);

% we fiddle with measurement system coordinates so that the final
% image coordinates used in the 8-par have x to the right and y up
FY=0;
for i=1:npts
    X=con2d(i, 2)/1000 - Xref;
    Y=con2d(i, 3)/1000 - Yref;
    % coordinate 1, 2
    crd1=mea2d(i, 2) - crd1_ref;
    crd2=mea2d(i, 3) - crd2_ref;
    switch pflag
        case 1
            x=crd1;

```

par8_1 s.m

```
y=crd2;
case 2
x=crd1;
y= -crd2 + FY;
case 3
x=crd2;
y= -crd1 + FY;
otherwise
end
ii=(2*i)-1;
B(ii, :)= [1 X Y 0 0 0 -x*X -x*Y];
B(ii+1, :)= [0 0 0 1 X Y -y*X -y*Y];
f(ii)=x;
f(ii+1)=y;
end

del=inv(B'*B)*B'*f;
del
a0=del(1);
a1=del(2);
a2=del(3);
b0=del(4);
b1=del(5);
b2=del(6);
c1=del(7);
c2=del(8);
residual=f - B*del;
disp(' residuals: x y');
disp(' note: these are in image space !!!');
rmsx=0;
rmsy=0;
for i=1:npts
xi dx=(i*2)-1;
yi dx=xi dx+1;
vx=residual(xi dx);
vy=residual(yi dx);
rmsx=rmsx + vx*vx;
rmsy=rmsy + vy*vy;
fprintf(1, '%5f %10.2f %10.2f\n', i, vx, vy);
end

rmsx=sqrt(rmsx/npts);
rmsy=sqrt(rmsy/npts);
disp(' image x, y rms');
[rmsx rmsy]

disp(' a0 a1 a2 b0 b1 b2 c1 c2');
[a0 a1 a2]
[b0 b1 b2]
[c1 c2]

disp(' offsets used to reduce coord magnitude');
Xref
Yref
crd1_ref
crd2_ref
```