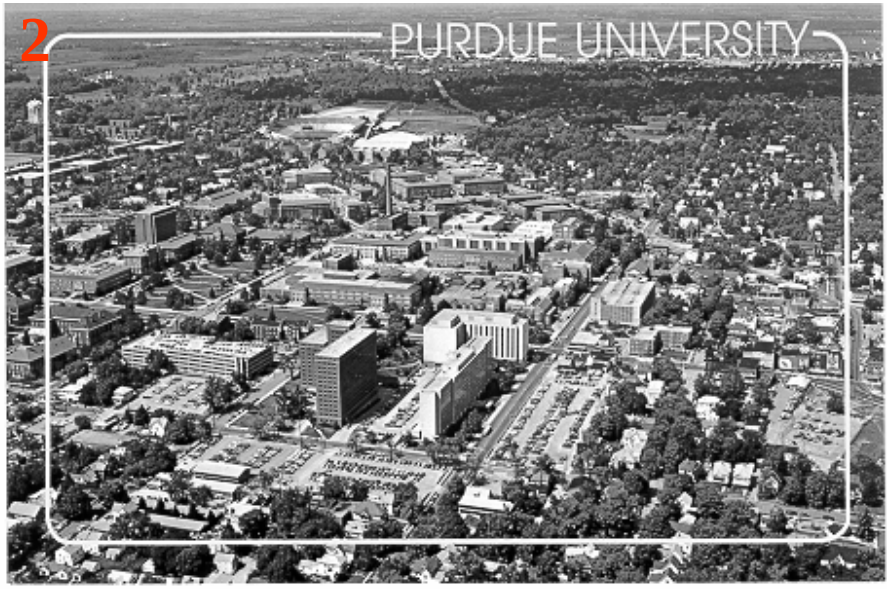
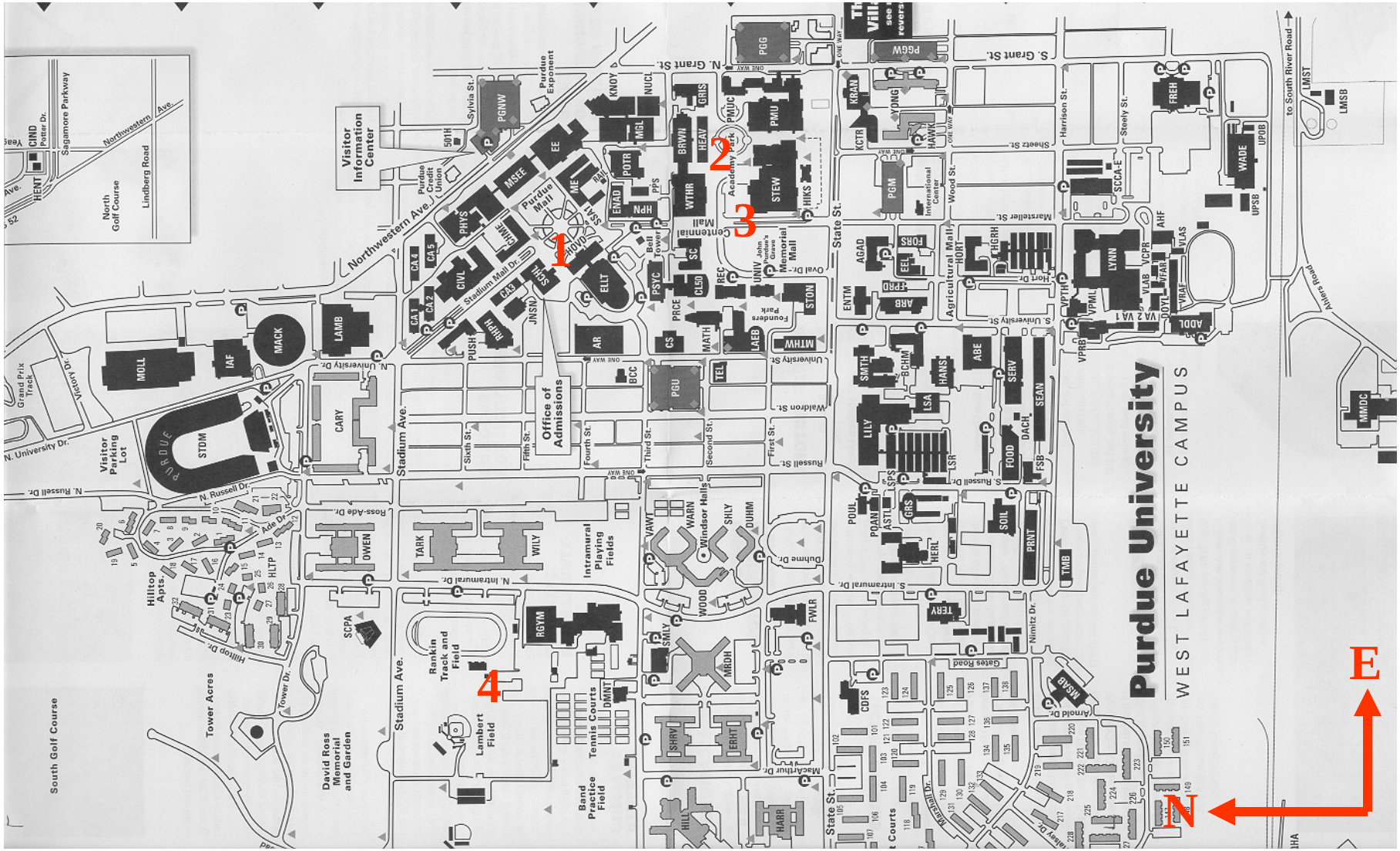
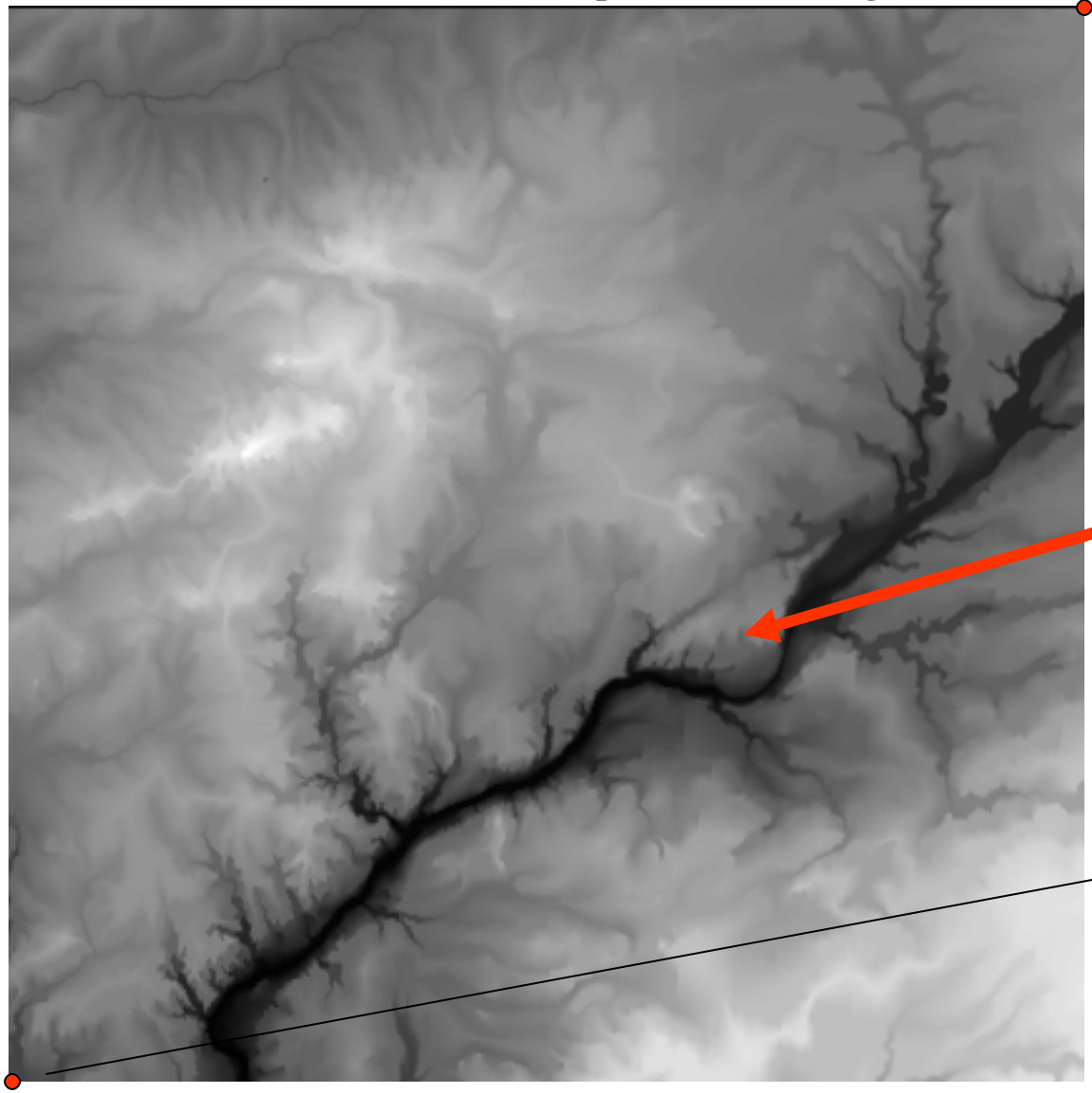
Homework 3. (a) estimate the rotation matrix, and extract omega-phi-kappa, for each of 4 images



(a) continued, use campus map for reference, approximate center of each image is indicated, approximate E,N axes shown



(b) Gray Shaded Elevation Map: Light=High, Dark=Low, this is reference for the next part of the assignment



Upper Right (UTM, zone 16)

E 532700m, N 4525800m

You are here

Lower Left (UTM, zone 16)

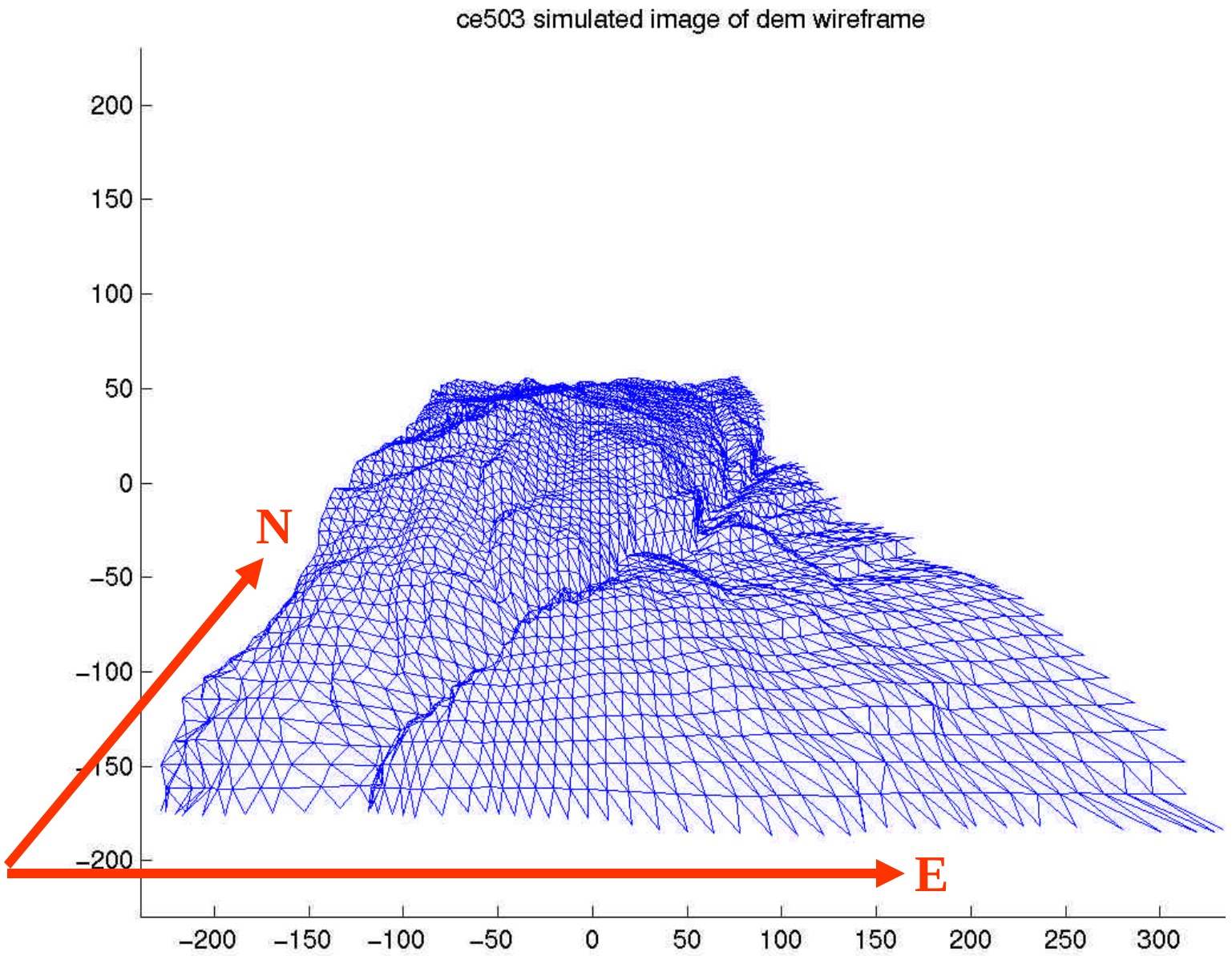
E 446700m, N 4441800m

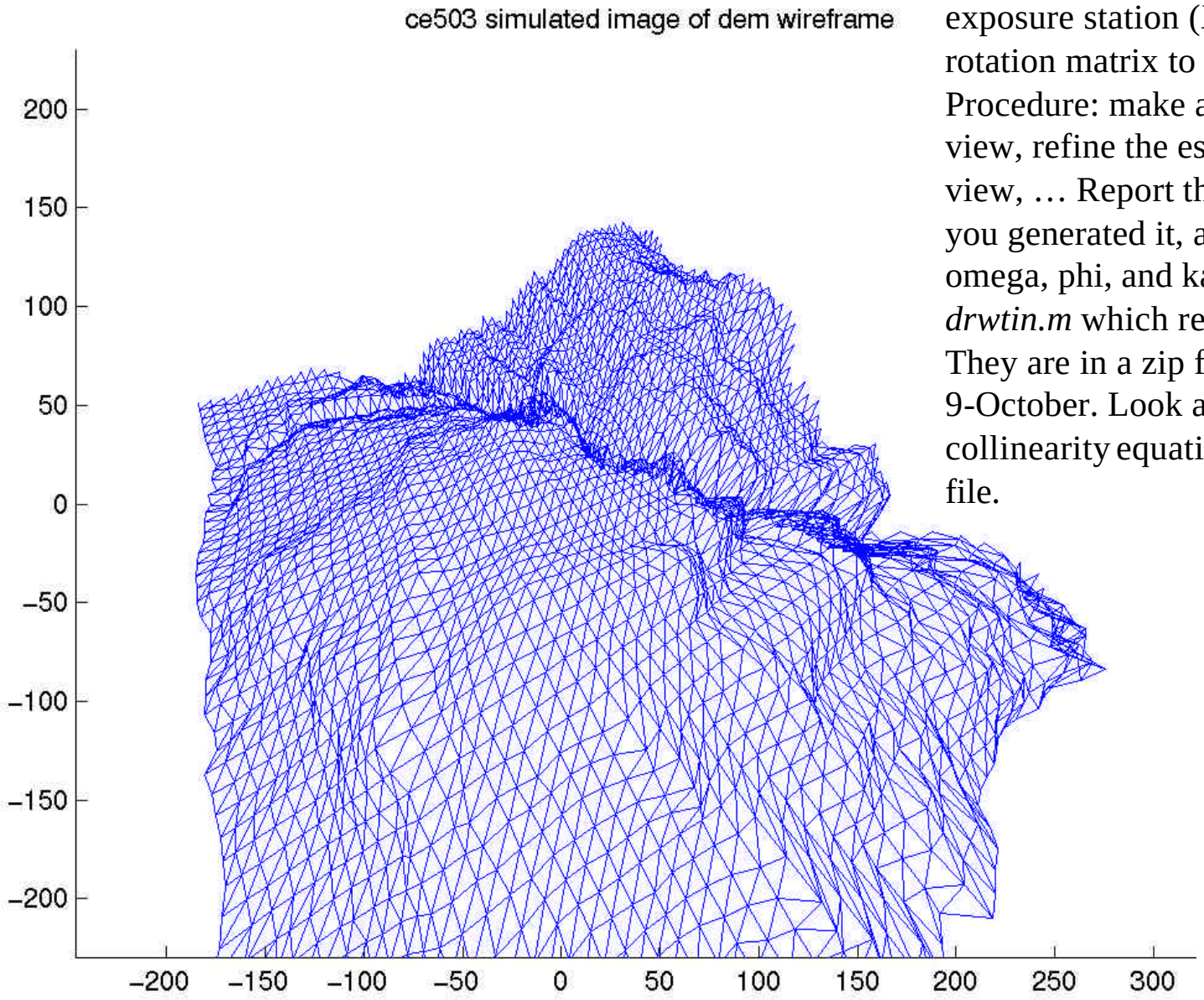
N

E

Tippecanoe and surrounding counties

DEM wireframe, view from the south, parameters in “drwtin.m”, TIN: “tippco8.tin”





(b) Graphical Resection – Estimate exposure station (X_L,Y_L,Z_L) and rotation matrix to generate this view. Procedure: make a guess, generate the view, refine the estimate, make another view, … Report the matrix, the way you generated it, and the conventional omega, phi, and kappa. Modify *drwtin.m* which reads from *tippco8.tin*. They are in a zip file. Due Wednesday, 9-October. Look at application of collinearity equations in the matlab file.

Listing of drwtin.m with parameters to generate the first view – modify this file to generate the second view.

```
% drwtin.m 26-sep-02
% draw a tin wireframe

XL=488700;
YL=4444541;
ZL=39259;

ax=45/57.29577951;
m=[1 0 0;0 cos(ax) sin(ax);0 -sin(ax) cos(ax)];

f=152.400;

fid=fopen('tippco8.tin','rt');
figure(1);
axis([-230 230 -230 230]);
axis equal;
hold on

x=zeros(3,1);
y=zeros(3,1);

while 1
  fline=fgetl(fid);
  if ~ischar(fline)
    break
    end
 n= sscanf(fline,'%f %f %f',3);
  fline=fgetl(fid);
  p1=sscanf(fline,'%f %f %f',3);
  fline=fgetl(fid);
  p2=sscanf(fline,'%f %f %f',3);
  fline=fgetl(fid);
  p3=sscanf(fline,'%f %f %f',3);
  dx=p1(1)-XL;
  dy=p1(2)-YL;
  dz=p1(3)-ZL;
  u=m*[dx;dy;dz];
  x(1)=-f*u(1)/u(3);
  y(1)=-f*u(2)/u(3);
  dx=p2(1)-XL;
  dy=p2(2)-YL;
  dz=p2(3)-ZL;
  u=m*[dx;dy;dz];
  x(2)=-f*u(1)/u(3);
  y(2)=-f*u(2)/u(3);
  dx=p3(1)-XL;
  dy=p3(2)-YL;
  dz=p3(3)-ZL;
  u=m*[dx;dy;dz];
  x(3)=-f*u(1)/u(3);
  y(3)=-f*u(2)/u(3);
  line(x,y);
  end
fclose(fid);
title('ce503 simulated image of dem wireframe');
```