ME 535 Assignment 3, Fall 2018 - Addendum

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Question 4.3:

c. Read the IGES file into Matlab

Name of igs file: Elephant.igs

```
% read the igs file to matlab
clear;clf;
file_name = input('Pleas input the file name: ','s');
fp = fopen(file_name, 'r');
s = fscanf(fp,'%c',[82 inf]);s=s';
fclose(fp);

n=size(s);
j=0;
for i=1:n(1)-1
    temp = s(i,:);
    t = str2double(temp(6:8));
    % If t=126 indicate this line recorded a BS_curve
    if t == 126
        j = j+1;
        % find the bs_curve parameter segment number
        l = temp(13:16);
        % the following find BS_curve parameter segment
        for ii = i:n(1)-1
            temp1 = s(ii,:);
            % find BSCURVE parameter segment
            if strcmp(temp1(77:80),l) & str2double(temp1(1:3)) == t
                % parameter segment sign, in our example is '21P'
                temp2 = temp1(70:73);
                row1 = ii;
                for i2 = ii:n(1)-1
                    temp3 = s(i2,:);
                    % find all parameter lines in the same BSCURVE
                    if strcmp(temp3(70:73),temp2)
                        % record the last BS_curve parameter line
                        k = i2;
                    end
                end
                for i3=1:k-row1+1
                    bs(i3,:)=s(row1+i3-1,:);
                end
                %call bspline processing function
                hold on;
                bsp_curve(bs);
                clear bs
            end
        end
    elseif t==128 %  BS_surface
        j=j+1;
        l = temp(13:16);%bs_surface eparameter segment
        %  find bs_surface parameter
        for ii=i:n(1)-1
            temp1=s(ii,:);
           if strcmp(temp1(77:80),l) & str2double(temp1(1:3)) == t% find BSCURVE parameter segment
                % parameter segment example: 25p
                temp2 = temp1(70:73);
                row1=ii;
                for i2=ii:n(1)-1
                    temp3=s(i2,:);
                    % find all parameter lines in the same BSCURVE
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```
                    if strcmp(temp3(70:73),temp2)
                        k=i2; %record the last BS_cruve parameter line
                    end
                end
                for i3=1:k-row1+1
                    bs(i3,:)=s(row1+i3-1,:);
                end
                %call bs drawing function
                hold on;
                bsp_surface(bs);
                view(-8,-42);
                clear bs
            end
        end
    end

end
```

```
degree 3
weights
  Columns 1 through 24

     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1

  Columns 25 through 48

     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1

  Columns 49 through 67

     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1

control points...
  -18.6117   10.5753         0
  -19.8940   10.1746         0
  -23.6342    8.5717         0
  -24.5959    0.6372         0
  -23.8746   -2.9694         0
  -21.4702   -7.6980         0
  -20.8291   -9.8619         0
  -21.5504  -11.4648         0
  -23.8746  -13.5486         0
  -26.1988  -14.4302         0
  -27.4010  -14.8310         0
  -28.0422  -14.9111         0
  -25.8783  -15.2317         0
  -25.0768  -15.2317         0
  -27.3209  -15.9530         0
  -27.8819  -16.1133         0
  -22.6724  -15.5523         0
  -19.1460  -12.5067         0
  -17.3828   -8.0987         0
  -17.3828   -4.6524         0
  -18.0239   -2.8091         0
  -17.5431   -1.6870         0
  -17.2225   -3.1297         0
  -16.8218   -4.4120         0
  -16.5813   -5.2134         0
  -15.6997   -3.7708         0
  -13.5358   -2.4885         0
  -14.3372   -6.6561         0
  -15.2188  -11.3045         0
  -16.1806  -14.7508         0
  -17.1423  -16.4339         0
  -18.1842  -16.4339         0
  -13.9365  -16.4339         0
  -12.6542  -16.5140         0
  -11.5321  -16.4339         0
  -11.7726   -9.0605         0
```

```
   -10.9711   -5.6943         0
    -9.9292   -0.8054         0
    -9.6086   -0.4848         0
    -3.1969   -0.8856         0
     0.8905   -1.4466         0
     1.5317   -1.6870         0
     1.7721   -5.6142         0
     2.4133  -13.6288         0
     2.2530  -15.4721         0
     1.3714  -16.5140         0
     0.5699  -16.8346         0
     6.2603  -16.8346         0
     6.9015  -16.6743         0
     5.1382   -9.4612         0
     6.1801   -2.8892         0
     7.7029    0.7174         0
     8.2639    0.4769         0
     9.0654   -1.6069         0
    10.1073   -2.8892         0
    11.0691   -3.1297         0
    10.1874   -1.1260         0
     9.3860    1.4387         0
     8.4242    4.1636         0
     8.5044    6.4879         0
     7.9434   11.5371         0
    -3.0366   11.7775         0
    -9.0476   11.1363         0
   -13.9365    9.2930         0
   -15.9402   10.9760         0
   -17.3293   10.9760         0
   -18.6117   10.5753         0

knotvector
  Columns 1 through 14

         0         0         0         0    3.3685    6.7371   10.1056   13.4742   16.8427   20.2113   23.5798   26.

  Columns 15 through 28

   37.0540   40.4225   43.7911   47.1596   50.5281   53.8967   57.2652   60.6338   64.0023   67.3709   70.7394   74.

  Columns 29 through 42

   84.2136   87.5821   90.9507   94.3192   97.6878  101.0563  104.4248  107.7934  111.1619  114.5305  117.8990  121.

  Columns 43 through 56

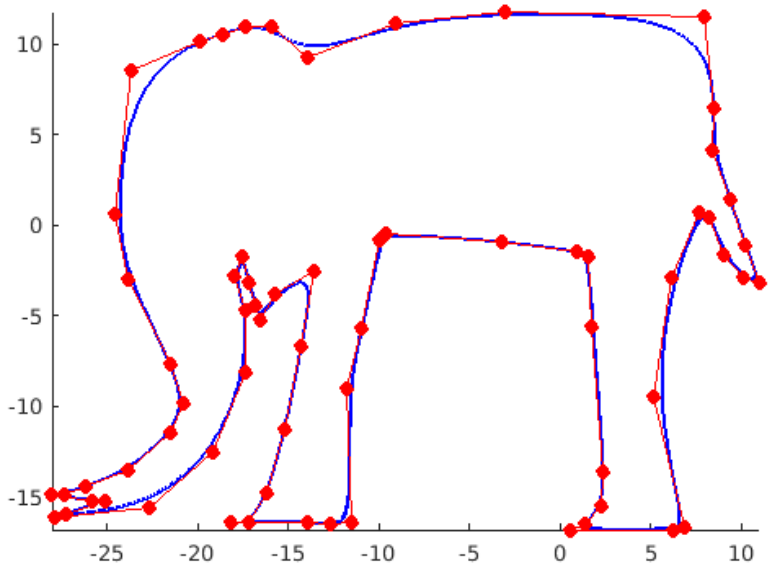
  131.3732  134.7417  138.1103  141.4788  144.8474  148.2159  151.5844  154.9530  158.3215  161.6901  165.0586  168.

  Columns 57 through 70

  178.5328  181.9013  185.2699  188.6384  192.0070  195.3755  198.7441  202.1126  205.4811  208.8497  212.2182  215.

  Column 71

  215.5868
```


10
5
0
-5
-10
-15
-25
-20
-15
-10
-5
0
5
10