

## Homework 3: Parameterization and Texture Mapping

0. Download and work on the homework 2 solution:  
[http://www.ece.lsu.edu/xinli/teaching/HW/HW2\\_Solution.zip](http://www.ece.lsu.edu/xinli/teaching/HW/HW2_Solution.zip)
1. Download the face mesh:  
<http://www.ece.lsu.edu/xinli/data/Susan.m>
2. Map the traced boundary loop to a unit square
  - a. pick a starting boundary vertex  $v_1$ , set it to  $(0,0)$ ;
  - b. pick the farthest boundary vertex  $v_3$ , set it to  $(1,1)$ ;
  - c. pick the mid boundary vertices  $v_2, v_4$  between path  $[v_1, v_3]$  and path  $[v_3, v_1]$ , set them to  $(1,0)$  and  $(0,1)$ , respectively;
  - d. using chord-length parameterization, map other boundary vertices on the path  $v_1v_2$ ,  $v_2v_3$ ,  $v_3v_4, v_4v_1$ , to  $(0,0) \rightarrow (1,0)$ ,  $(1,0) \rightarrow (1,1)$ ,  $(1,1) \rightarrow (0,1)$ ,  $(0,1) \rightarrow (0,0)$ , respectively.
3. Map interior vertices using harmonic weights, by solving the linear systems  $Ax=u$ ,  $Ay=v$  on both directions.
4. Download the checkerboard bmp file:  
<http://www.ece.lsu.edu/xinli/data/check.bmp>  
then:
  - (1) Write a program to parse and render the bmp file;
  - (2) Conduct the texture mapping, wrap it to the face.

***DUE: 11:59pm 11/2***