Math 371 Group Project 2: Spline Function

Project

Cubic splines are used extensively in a wide range of applications from Boeing designing airplanes to Pixar creating animated films. With this project, you will see the implementation of cubic splines as a way to model everyday shapes.

1. Make a plot of one of your group member's hand with Matlab. To do this, check Matlab command "ginput".
   (a) Read the documentation for "ginput" to learn what it does.
   (b) Run "ginput" and put your hand on the screen. Click all the sample points that you think will capture the shape of your hand. Save your data into an n by 2 matrix. You can use scatter plot to check your sample points.
   (c) Use the sciprt "interparc.m" in the project folder to fit a spline to the sample points of your hand.

   Congratulations, you've just created a snapshot of your own hand.
2. Create two interesting spline function with sample points.
   (a) One in two dimension, one in three dimension. The "interparc.m" can handle both.
   (b) Each member should create his/her individual distinct graphs.
   (c) The sample points must be generated by code (no hand picking nor mouse click). You need to explain the procedure.
   (d) Give your curves names.
3. Put the file "secret.mat" and "test.m" in your Matlab working directory
   (a) Run "test.m" and see what it does.
   (b) Run the code with different values of "theta". Explain what "theta" does. Why?
   (c) Modify the code to produce an upside down picture of the original object.
   (d) Create an animation which makes the object roll horizontally/vertically. Explain the procedure.