Homework 4

CSE 291 I00: Machine Learning for 3D Data (Winter 2018)

PLEASE READ:
Submit printouts of well commented codes on March 20. You are encouraged to discuss in groups (two people for each group), but please complete your programming and writeup individually. Indicate the name of your collaborator in your wrteup.

1. **Laplacian of a chain** 40pt
   Build a chain graph of 30 nodes and compute the laplacian eigenvectors. In your writeup, please include the plot of top 20 eigenvectors.

2. **Laplacian of a lattice** 30pt
   Build a lattice of 30 by 30 and compute the laplacian eigenvectors. In your writeup, please visualize the top 20 eigenvectors on the lattice.

3. **Approximation of an image by laplaican bases** 30pt
   Find a picture online and resize the picture as 150 by 150. Then, reconstruct the image by the top 30 eigenvectors of the lattice Laplacian bases. In your writeup, please visualize the reconstructed image.