CS109 Introduction to Probability for Computer Scientists

Two machine learning programs:

Naïve Bayes Classifier
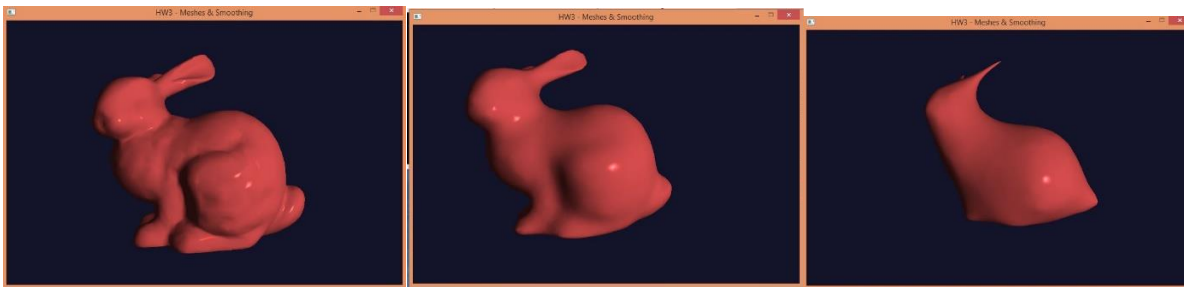
Bootstrapping algorithm

Code can be found in github: https://github.com/wenxinmmb/-cs109

CS 148 Introduction to Computer Graphics and Imaging

Real Time graphics

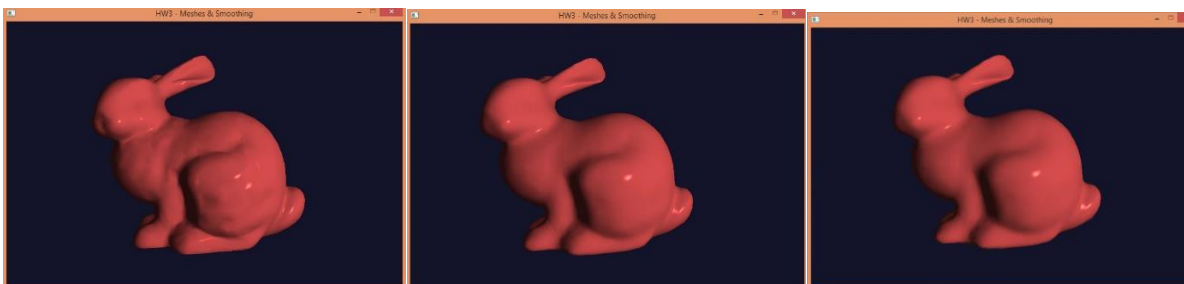1) Implementing Laplacian Smoothing. The meshes shrink.

| Original picture | 16 iterations of Laplacian Smoothing | 64 iterations of Laplacian Smoothing |

2) Implementing HC-algorithm, which maintain original feathers when smoothing.
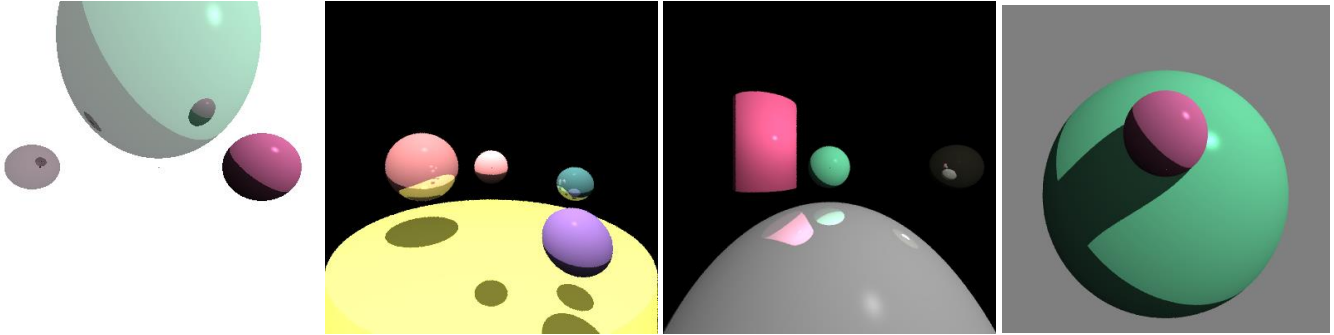

| Original picture | 16 iterations of HC-algorithm Smoothing | 64 iterations of HC-algorithm Smoothing |

Simple Ray Tracer

My ray tracer can represent basic geometries such as planes, spheres, and cylinders.
Feathers include phong shading, casting shadow, mirror reflection, antialiasing, and depth of field


Image Filters with CUDA (GPU programming)

Parallel processing images with CUDA, which is an extension of C++, used for writing code than can run on GPU. Each pixel is handled by a thread.

Blur filter was implemented by setting each pixel's RGB value to the average RGB value of the pixels surrounding it.

CUDA block includes threads that handle the pixels in the same row. I used shared memory to store image data of each block and thread synchronization to coordinate threads in the same block, switching the pixels' values of two sides of the image.

Color swap filter was made by swapping the values of blue and green color channels.
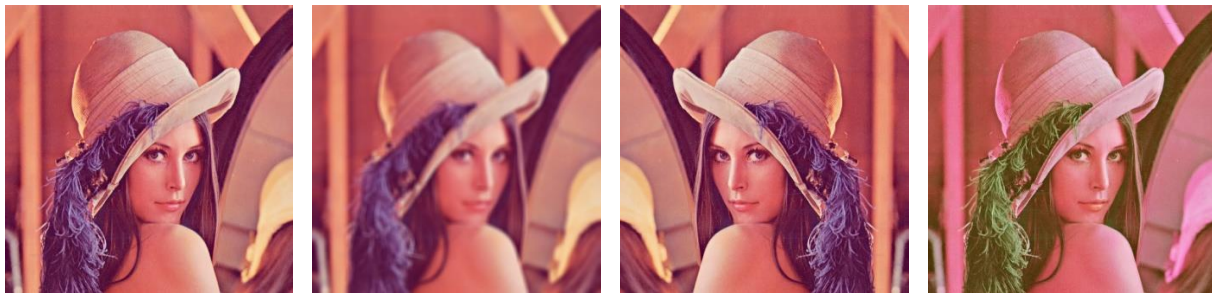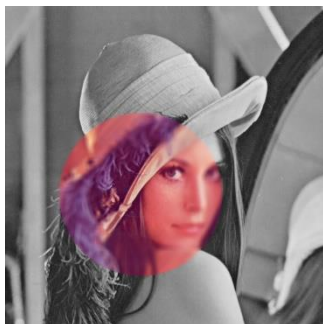

Original Image   Blur filter   Flip filter   Color swap filter

Radial Blur + Black and White filter

Render the image outside circle to black and white, the inside pixels are blurred to different extent according to their distance to the center of the circle.

Final project: Travel in Water Town

The whole project was created using OpenGL libraries. A small boat traveling along the river, the camera follows the boat to explore the view alongside the river.
I made all the 3D models in Maya from scratch and applied textures I found online. The houses and other objects were generated procedurally as the camera was moving forward.

Particle System to simulate snow:

Link to demo: https://youtu.be/3hGc6kqP4l4