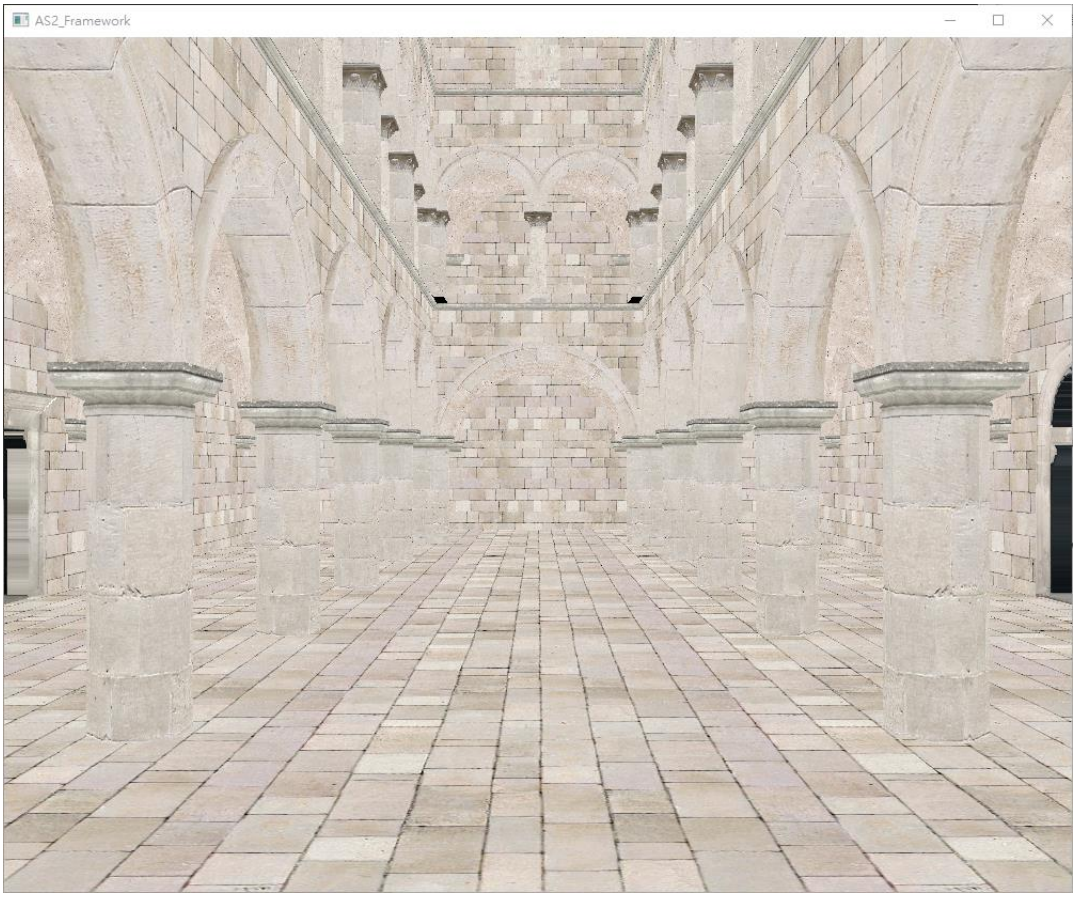
Graphics programming assignment 2 111062665 林柏臣

Diffuse texture




Normal Color

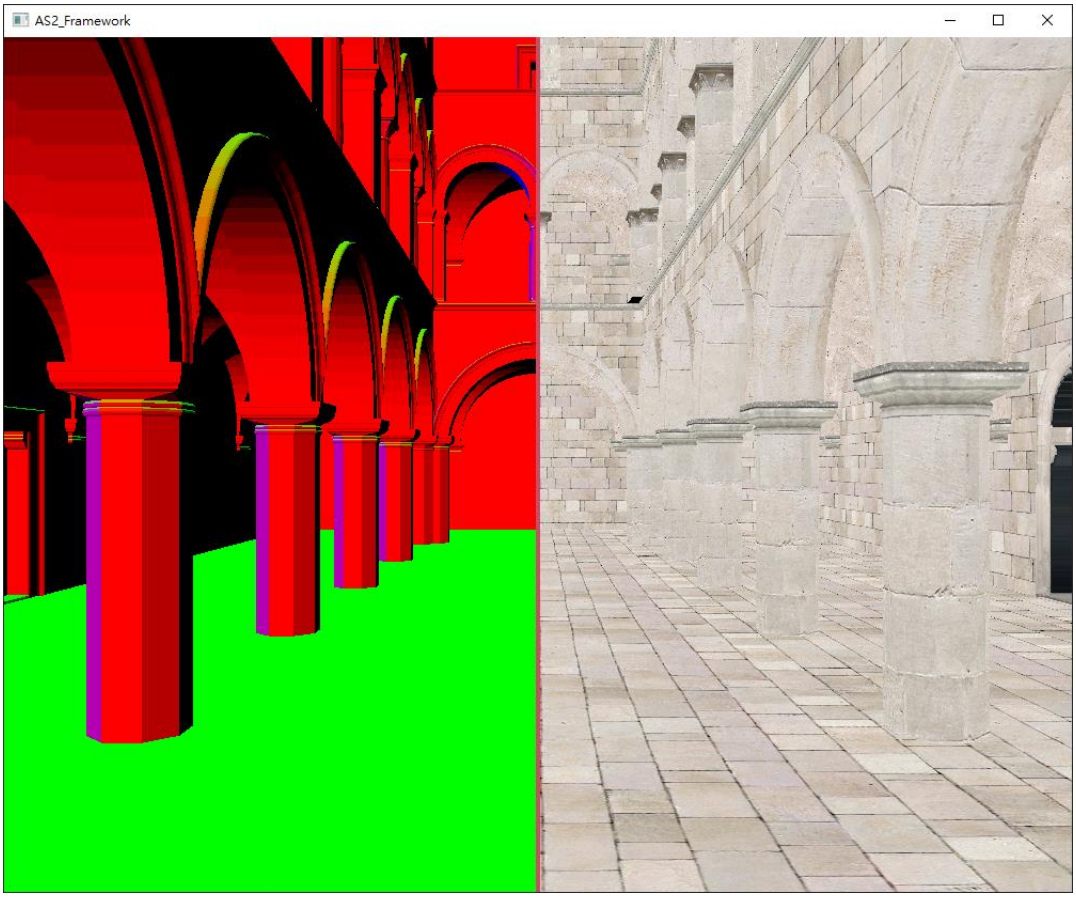
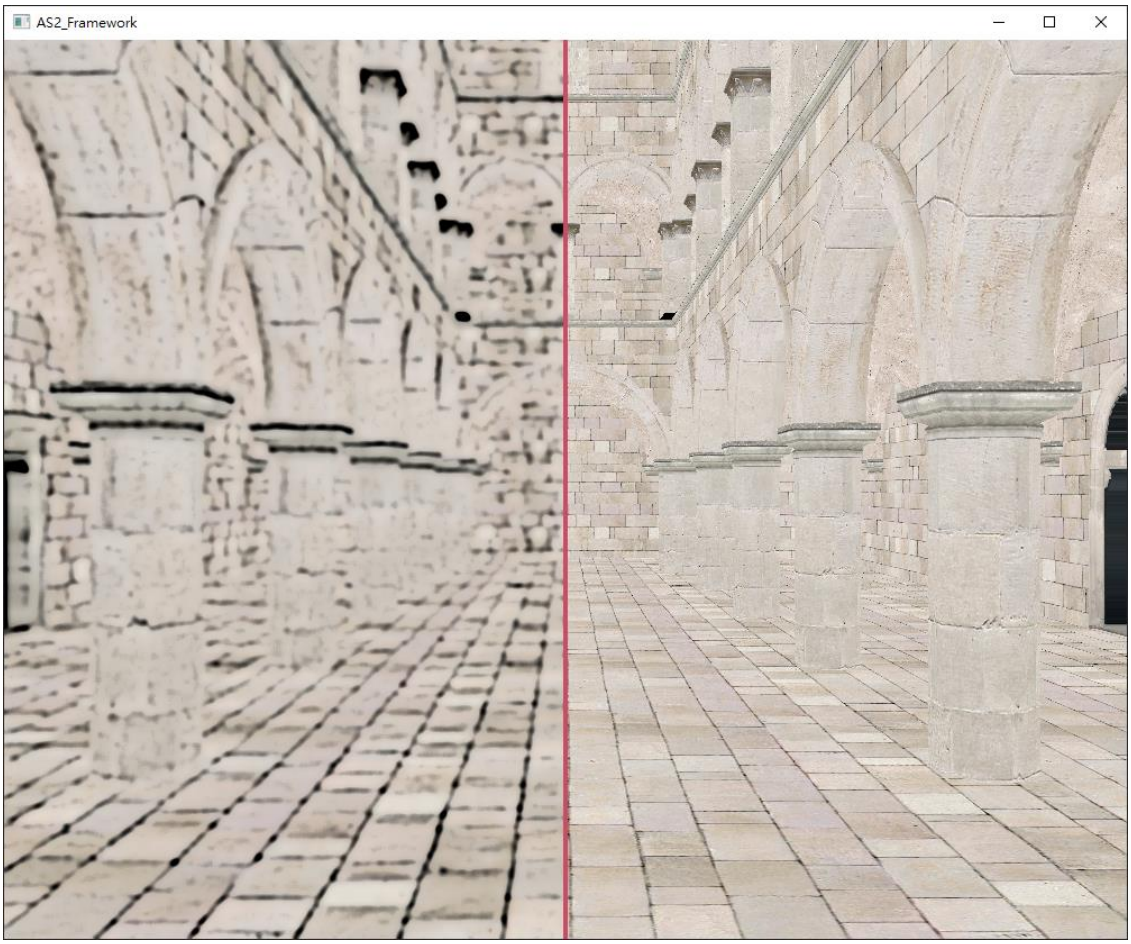
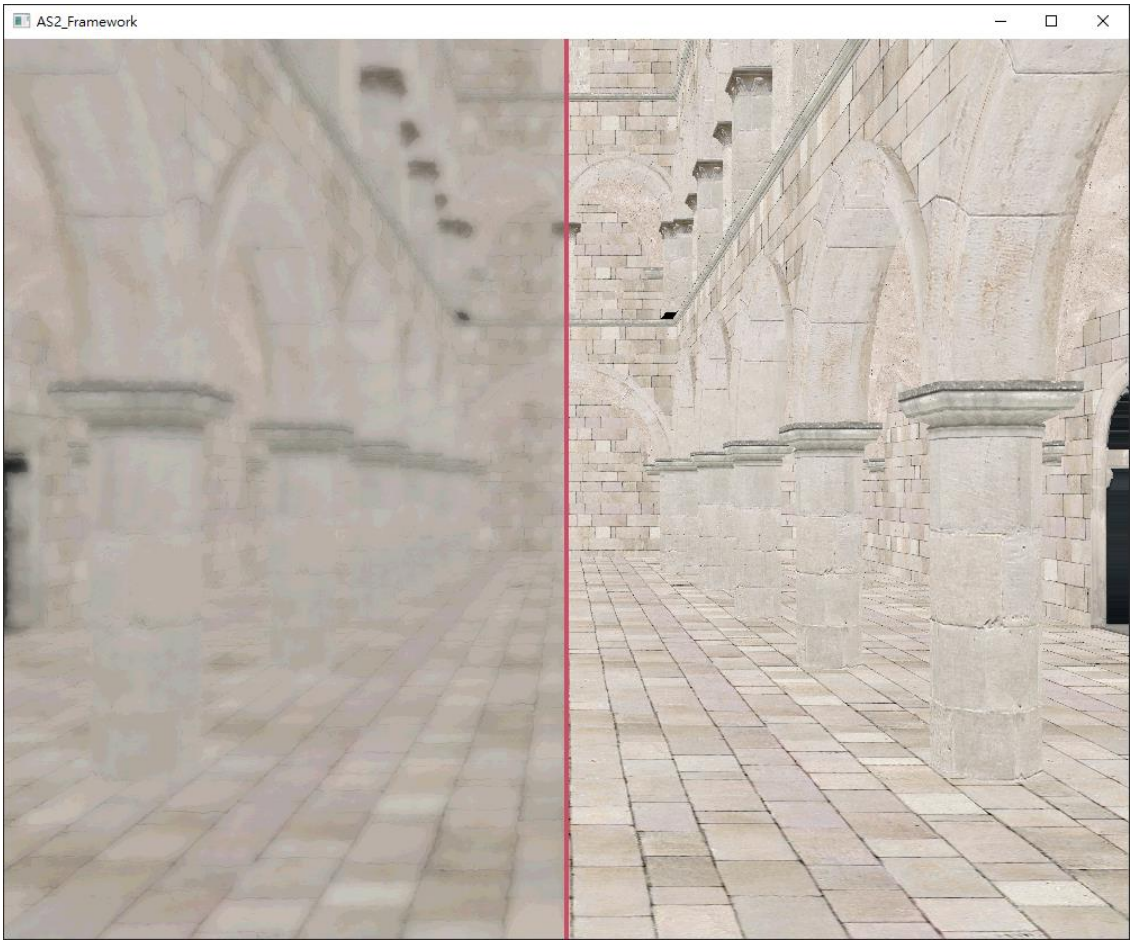


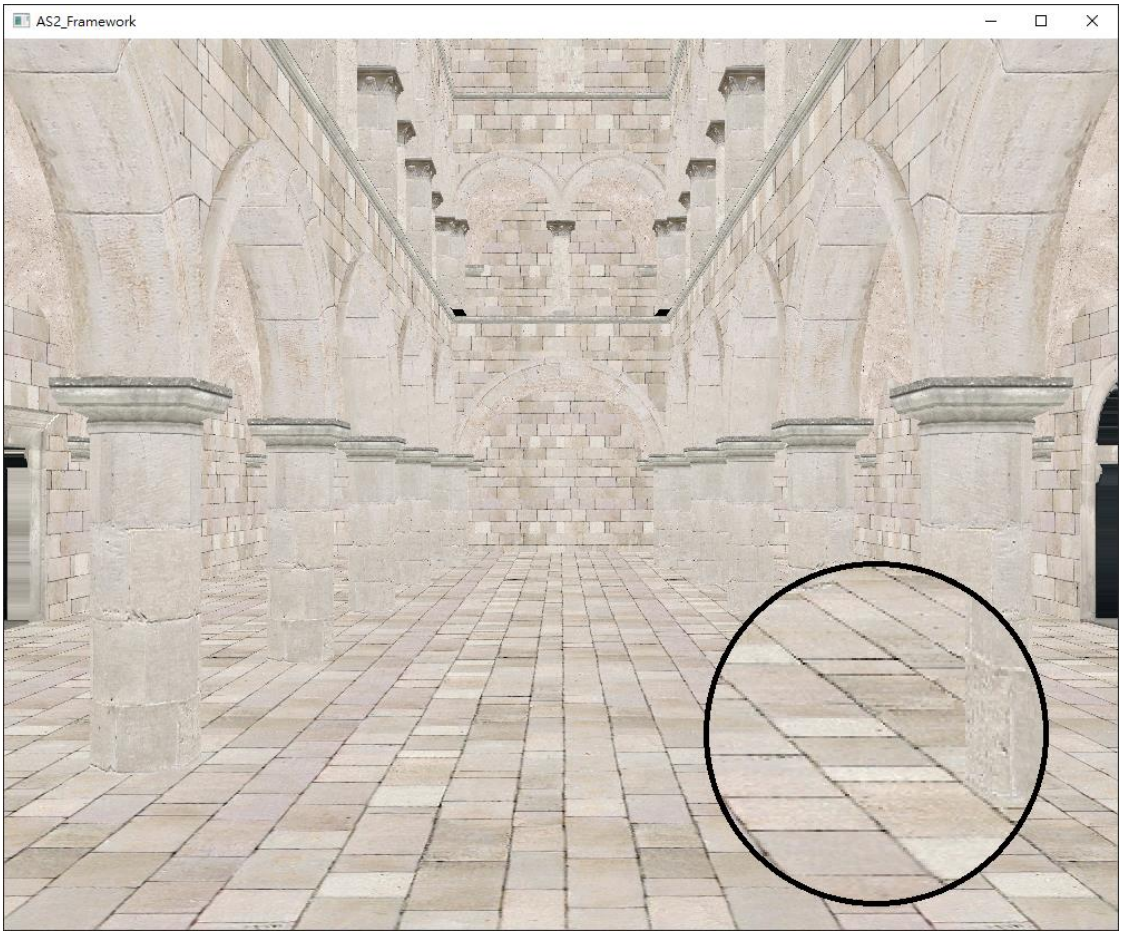
Image abstraction



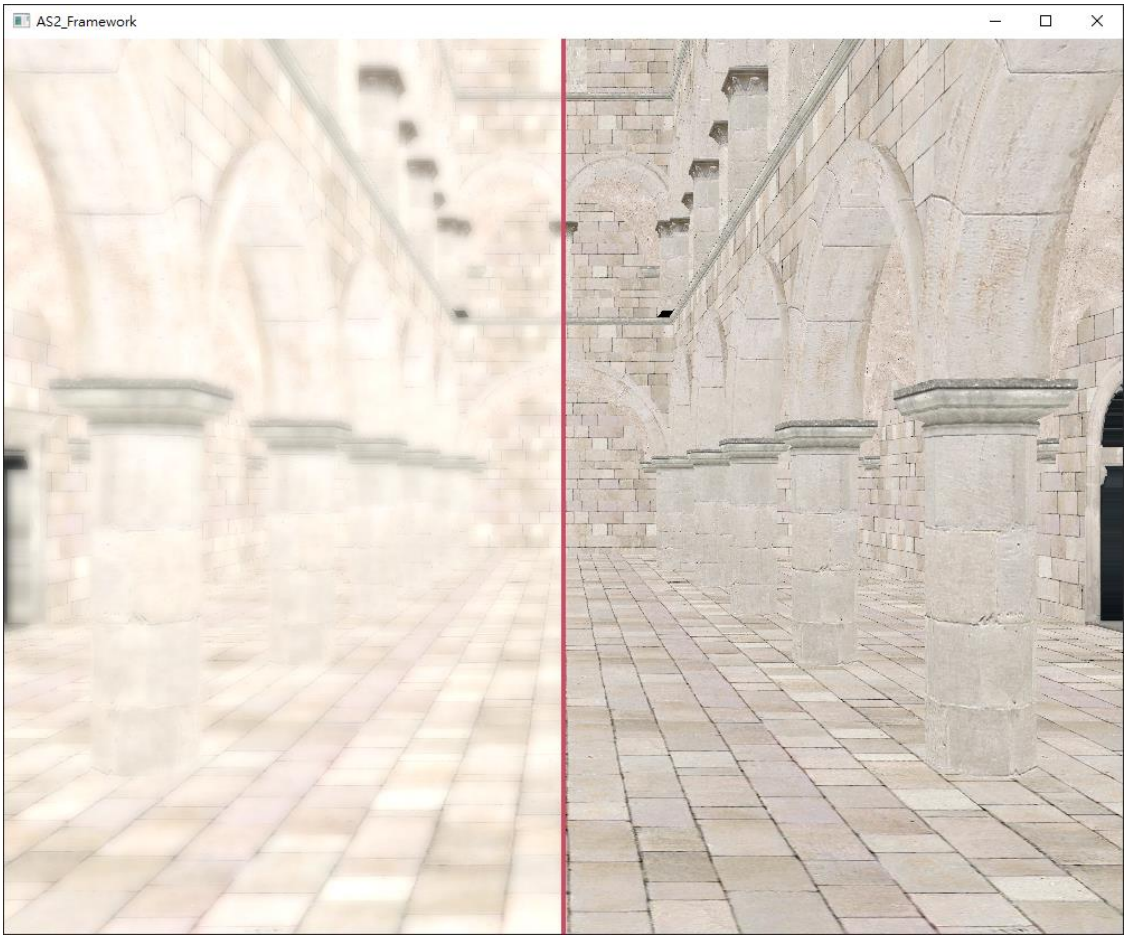

Watercolor



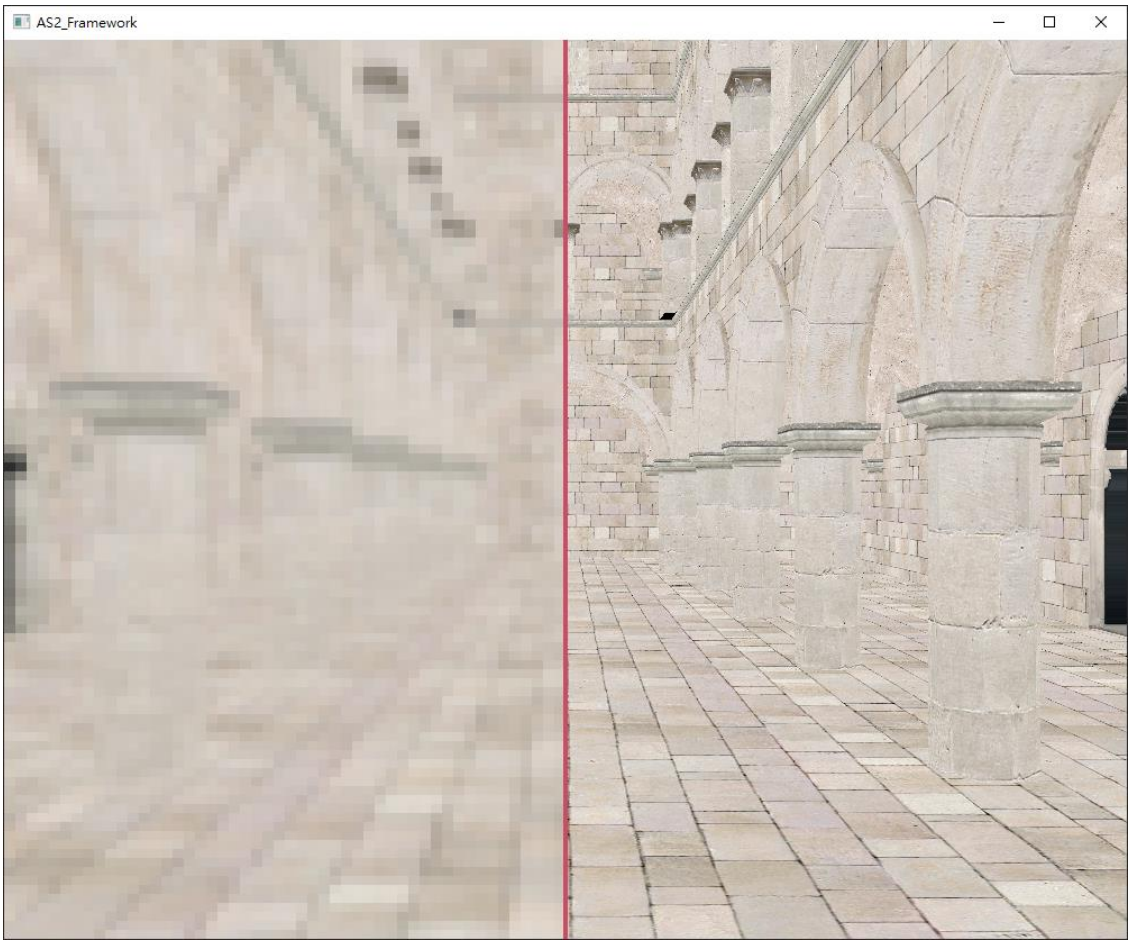
Magnifier



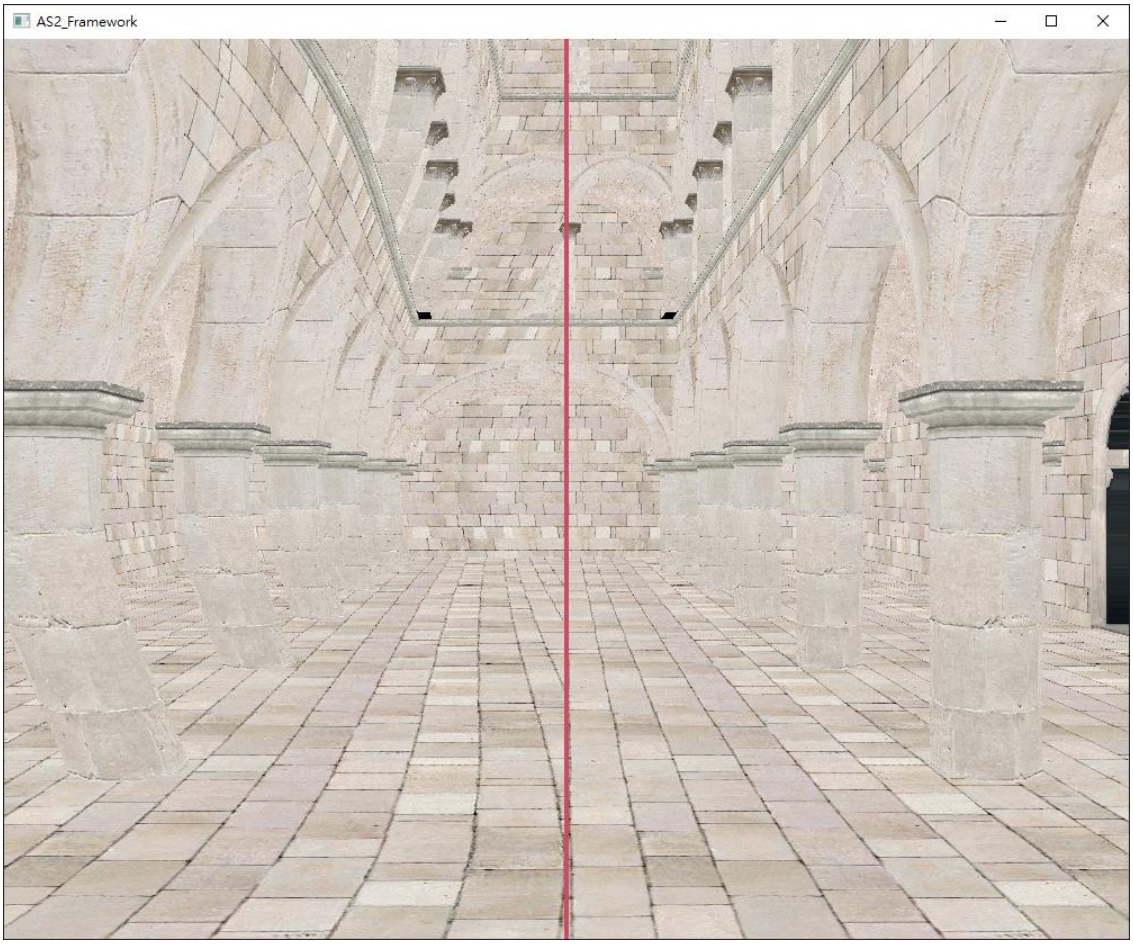

Bloom effect



Pixelization




Sinewave distortion



## Initialization

- Load shader programs (model/bloom/screen)
- Load model with Model class
  - Read model file with assimp
  - Loop over all nodes
    - Read mesh from node
    - Create Mesh struct with vao, vertex count and material id, and push into mesh vector
  - Loop over all materials
    - Load diffuse texture if there is one and save into <int, texture id> map
- Setup VAO and VBO, FBO, texture, RBO for frame buffer rendering, we use two textures, one for texture color another for normal color
- Setup shader program for model rendering
- Setup FBO, Texture for gaussian blurring (ping-pong frame buffers)
- Setup shader program for blurring
- Setup shader program for final screen rendering

## Loop

- Setup model-view matrix by glm::lookup
- Update uniforms for mvp matrix
- Bind fbo for first offscreen rendering
- Draw Meshes by binding texture, vao and call glDrawElements
- Use ping pong frame buffers to blur texture
  - At second iteration (fourth for iteration, as we separate two directions to do gaussian blur) we use glCopyTextureSubImage2D to save blurred texture for DOG filtering
- Bind to screen framebuffer and draw to screen

## My_Reshape

On reshape we recalculate perspective matrix and recreate all textures of the framebuffer

## My_Timer

Keep track of deltaTime for mouse movement

## My_Keyboard

Update pos vec3 with respect of eye direction, with the help of front and right vec3. After updating, we reset pos.y to its original to prevent going up and down

## My_MotionMouse

Update cursor icon if it is hovering compare bar
if moveBar == true
    we update barPos with mouse position
else

calculate yaw and pitch with mouse x_offset and y_offset and calculate front and right vec3
Update mouse position uniform

## My_PassiveMouse

Update cursor icon if it is hovering compare bar
Update mouse position uniform

## My_Menu

Update uniform uMode for effect toggle in screen shader

## Screen shader fragment

Two parts:

- Calculate texCoords
- Sample with colorTexture, normalTexture, weakBlurTexture and blurTexture
- Update color with sampled colors

I ensured each sampler is used equally to prevent Non-uniform flow control.

## IDE

Visual studio 2017 / C++14