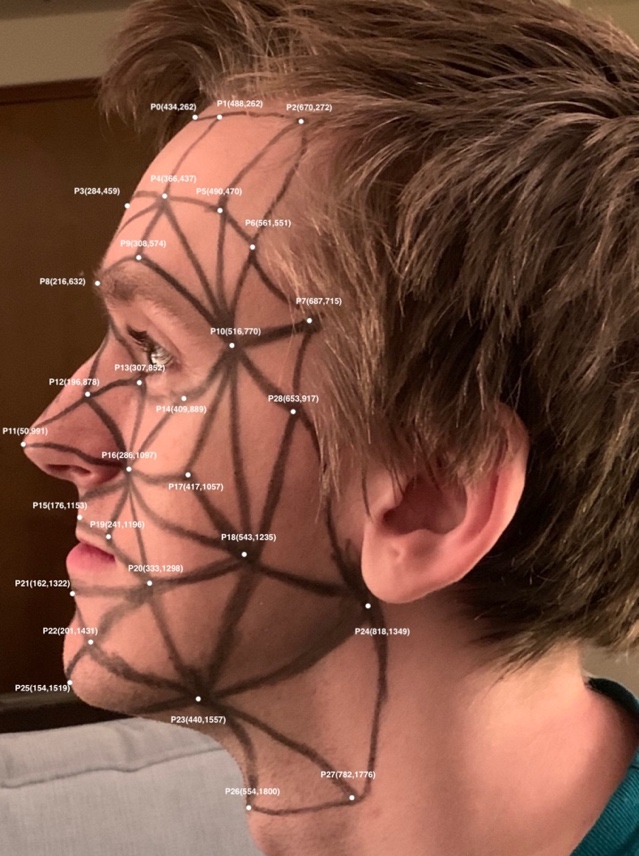
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Assignment 5

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**Assignment Objective:** To recreate the early work of Gouraud by digitizing a human face.

**How achieved:** To achieve this objective, we first captured front and side (profile) photos after replicating the ‘lined face’ approach shown by Sylvia Gouraud. The front photo had its points numbered, and labelled, and then each point was measured to the closest pixel value. Then, the same point numberings were given to each corresponding point in the side angle photo. These were also measured. The resulting photos are below:

These vertices were placed into CubeColourGouraud.cpp, renamed to FacePhong.cpp. The code was adapted to use the points and triangles mapped above. It was also changed to implement smooth not faceted shading and implement Phong lighting and shading. Results of 10.2 are shown in *Results* section.

Next, we continued to exercise 15.5. The code file *FacePhong.cpp* was duplicated and renamed *TextureMappedMesh.cpp.* A TGA file was generated using the front-angle face (we did not capture a photo before the lines were drawn on the face, so the lined face photo had to be used). An array was added for texture coordinates, and these were initialized to be the same as the (x,y) coordinates of the face vertices.

Then, InitVertexBuffer() was changed to:

*void InitVertexBuffer() {*

*// create GPU buffer, make it active*

*glGenBuffers(1, &vBuffer);*

*glBindBuffer(GL\_ARRAY\_BUFFER, vBuffer);*

*// allocate memory for points and normals*

*glBufferData(GL\_ARRAY\_BUFFER, 2\*sizePts + sizeof(uvs), NULL, GL\_STATIC\_DRAW);*

*// copy*

*glBufferSubData(GL\_ARRAY\_BUFFER, 0, sizePts, &points[0]);*

*glBufferSubData(GL\_ARRAY\_BUFFER, sizePts, sizePts, &normals[0]);*

*glBufferSubData(GL\_ARRAY\_BUFFER, sizePts \* 2, sizeof(uvs), &uvs);*

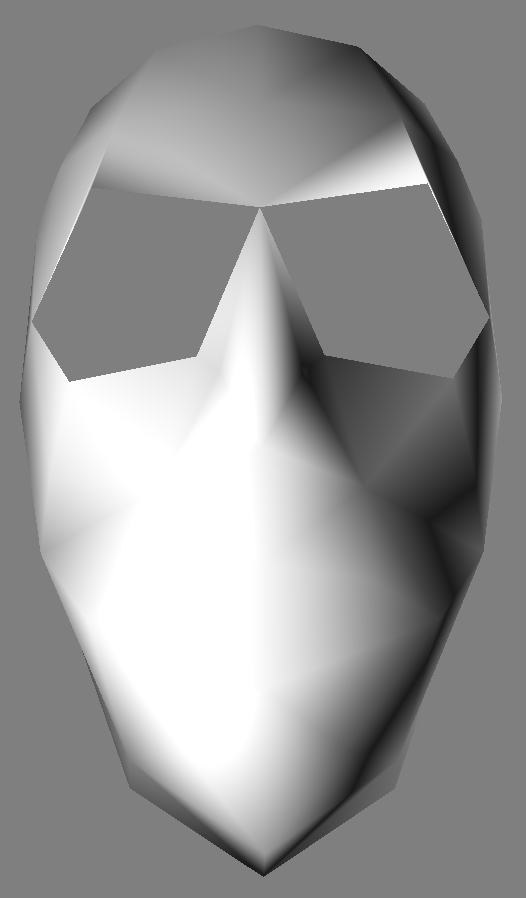
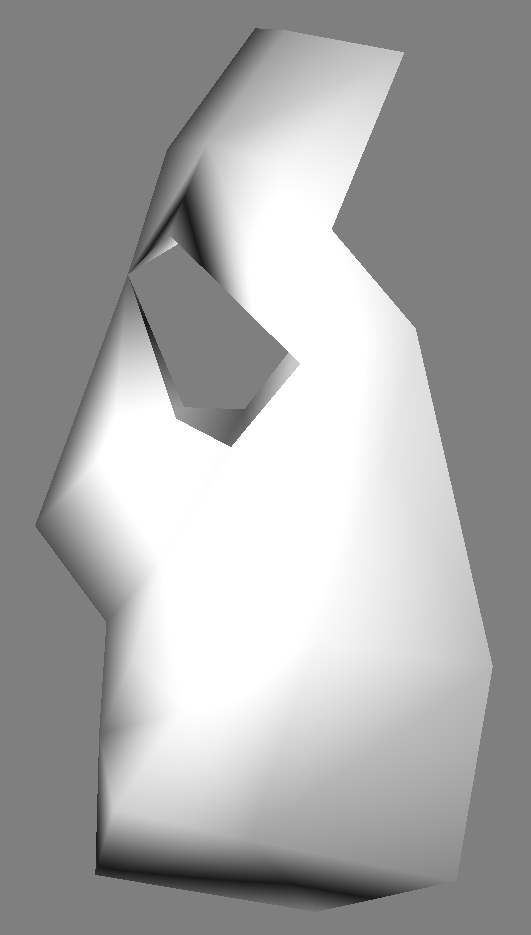
*textureName = LoadTexture(filename, textureUnit);*

*}*

After making additional changes, we ran into a problem with an exception being thrown in GLunit LoadTexture() of Misc.cpp : *Exception thrown at 0X000000000 in graphicsapps.exe: -xC000005: Access violation executing location 0X0000000.*

To solve this, I moved GLuint textureName = LoadTexture to Init(), but then we started getting “can’t find named uniform: color… persp… modelview” error. After this point, we were unable to further debug.

**Results:**

** **

*(Above) Resulting front and side views after completing Exercise 10.2*