COMP 5411: Advanced Computer Graphics

OpenGL Introduction

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We have prepared a demo program for you to get hands on OpenGL. We use

- GLFW (`http://www.glfw.org/`) for window management,
- CMake (`https://cmake.org/`) for generating make files or IDE project files.

The code has been tested on Windows and macOS. This demo serves the following purposes:

- showing how to use GLFW for window management;
- showing how to use the callback mechanism in GLFW for user interactions;
- showing how to construct/manipulate self-maintained Modelview and Projection matrices;
- showing how to use shaders for rendering in modern programmable OpenGL pipeline.

Please follow the instructions to compile source files of the demo before obtaining the executable program.

1 Preparation

Please install CMake if it does not exist in your operating system. You can go to `https://cmake.org/download/` for obtaining the installation file.

Besides, make sure you also have a C++ compiler (and an IDE) installed. For example, on Windows, Visual Studio 2015 or above is preferable.

2 Download

Source files of the OpenGL demo are located at `https://course.cse.ust.hk/comp5411/ogl_beginner/OpenGLIntro.zip`. Download the zipped file and extract its content into a folder, for example, named `~/demo`.

3 Compilation

Here are the instructions for compiling the source files on Windows and macOS.

3.1 Windows

Assume you have installed Visual Studio 2015.

1. Open CMake and fill in the paths. We can use a folder named `~/demo/build` for storing make files or IDE project files. See Figure 1.

2. Press the button Configure and choose the compiler you have installed, then press the button Finish. See Figure 2.

3. After the configuration is done, press the button Generate.

4. Go to the folder `~/demo/build` and double-click the file OpenGLDemo.sln.

5. In the opened Visual Studio, you may want to change the build type to Release for better performance. Then click the project OpenGLDemo in the Solution Explorer using the right mouse button and select Build. See Figure 3.

6. After the build is done, go to the folder `~/demo/build/Release` for obtaining the executable program. Open the program and follow the instructions printed in the console for interactions. See Figure 4.

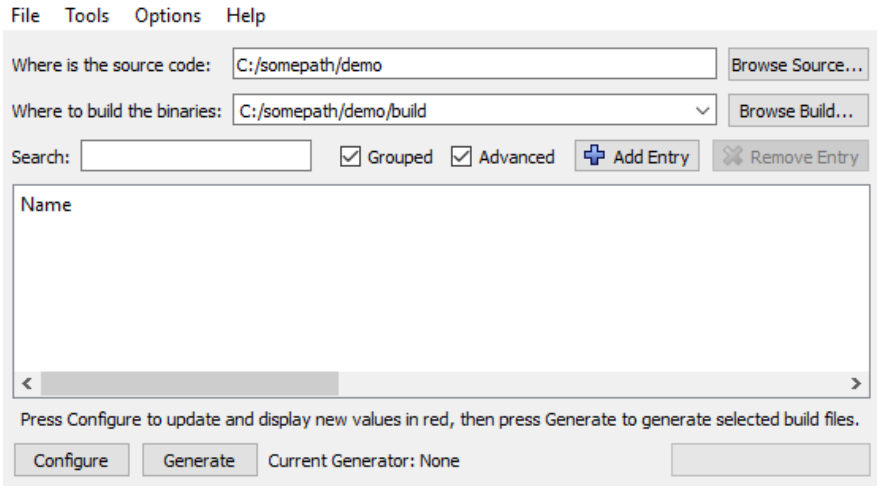

Figure 1: Windows: fill CMake paths.

3.2 macOS

1. Open a Terminal and go to the folder `~/demo`

2. Create a folder named build: 'mkdir build'

3. Go to the created folder: 'cd build'

4. Run CMake command: 'cmake ..'

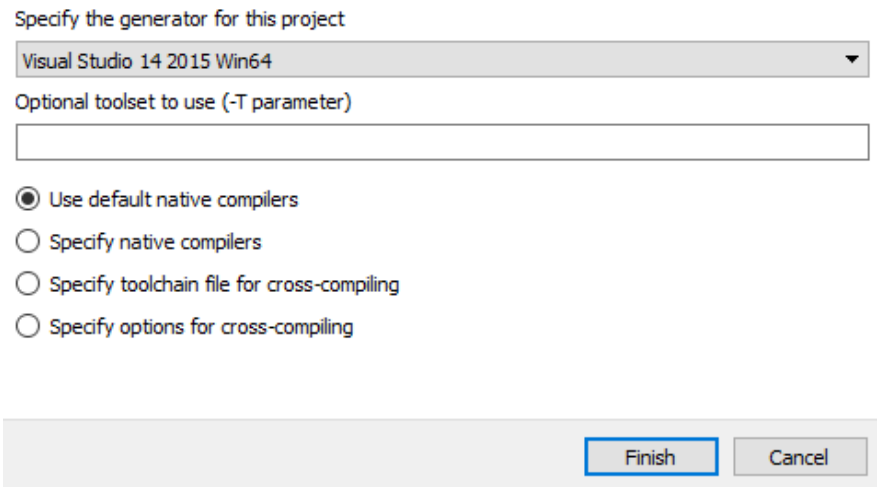

Figure 2: Windows: choose the compiler.

5. After the configuration is done, run Make command: 'make'

6. After the compilation is done, open the executable program named OpenGLDemo and follow the instructions printed in the console for interactions.

4 Others

For more detailed OpenGL programming tutorials, you can visit this website `http://www.opengl-tutorial.org/` or google other websites.

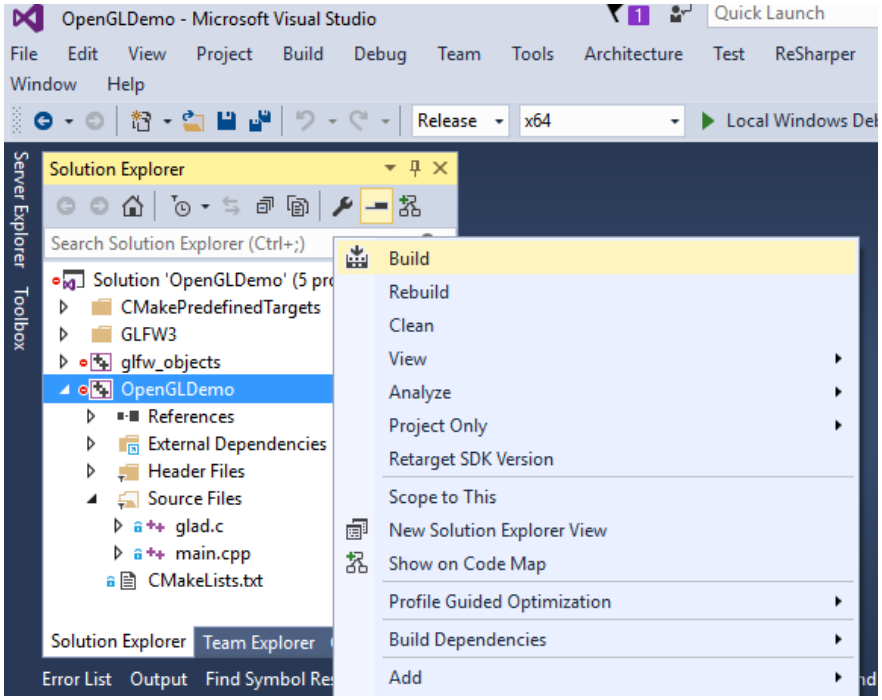

Figure 3: Windows: build the project.

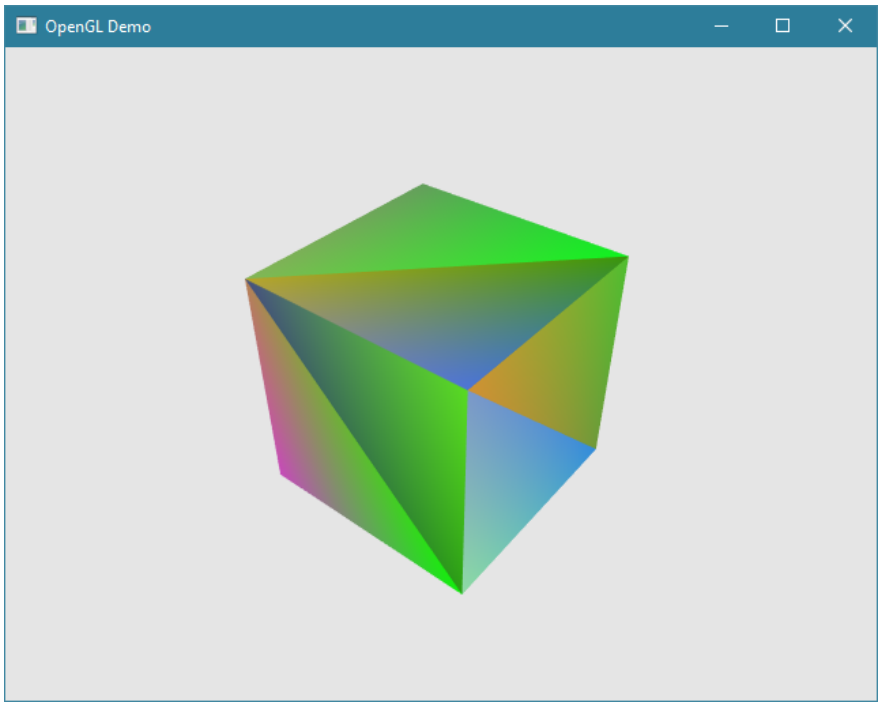

Figure 4: A rotating colored cube.