OpenGL
Programming
with Visual Studio
& freeglut

本節內容

- 1-1. 簡介GLUT以及freeglut工具
- 1-2 設定freeglut在開發環境
 - Visual Studio 2017
- 1-3 執行測試第一個OpenGL程式

本節目標

- 1. 認識GLUT以及freeglut
- 2. 學會設定freeglut在開發環境上
- 3. 執行第一支OpenGL程式

簡介GLUT以及 freeglut工具

GLUT

- 為OpenGL Utility Toolkit縮寫
 - 幫助OpenGL學習者能夠容易的使用「視窗操作, 製作選單,鍵盤、滑鼠功能以及操作輸入輸出」
 - 但仍有問題存在,最新版本為GLUT3.7 (於2001年釋出)



- · 本堂課主要使用的工具freeglut
 - 取代了GLUT,並改善了不少的缺點且持續在更新.
 - 目前最新版本Freeglut 3.0.0



在開發環境 Visual Studio 2017 設定freeglut

下載freeglut

o 請到 <u>freeglut 官網</u>並點選下圖Prepackaged Releases的 Martin Payne's Windows binaries (MSVC and MinGW)

Downloads...

Below are file links for the FreeGLUT project. README files are included. Have

Testing Releases

Feel free to test by downloading a tarball of current trunk, or grabbing a copy f

There are no presently active testing releases.

Stable Releases

```
Freeglut 3.0.0 [Released: 7 March 2015]
Freeglut 2.8.1 [Released: 5 April 2013]
Freeglut 2.8.0 [Released: 2 January 2012]
Freeglut 2.6.0 [Released: 27 November 2009]
Freeglut 2.4.0 [Released: 9 June 2005]
Freeglut 2.2.0 [Released: 12 December 2003]
Freeglut 2.0.1 [Released: 23 October 2003]
```

Prepackaged Releases

The FreeGLUT project does not support packaged versions of FreeGLUT exce Here's a list which is likely incomplete:

Martin Payne's Windows binaries (MSVC and MinGW)

Florian Echtler's MPX Patch

Transmission Zero

freeglut Windows Development Libraries

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Introduction

Whilst at the University of Essex, I took a module called "Interactive Computer Graphics" (or *EE222* as we referred to it). Half of the course consisted of using POV-Ray to create images, and then putting them together to make a high quality animation. The other half of the course consisted of programming real-time interactive graphics using C and OpenGL, with the help the GLUT library *freeglut*. I went on to do my final year project, creating a simulation in C++ and OpenGL. It was the first time I had ever written a real application, and I still have a soft spot for GLUT.

For my university project, I used Nate Robins' GLUT for Win32 project for the Windows build, and freeglut for the Linux build. Windows freeglut binary packages are somewhat hard to find, particularly for the MinGW compiler, so I've created suitable packages and put them online. You can use them to build freeglut applications using Microsoft's Visual C++ and MinGW.

freeglut 3.0.0 MSVC Package

This package contains 32 and 64 bit Windows DLLs, import libraries, and header files, allowing freeglut applications to be written using Microsoft's Visual C++. The package was built from source code using Visual Studio 2013. The DLL is binary compatible with both my MinGW DLL, and the GLUT for Win32 DLL provided by Nate Robins. The DLL has been tested on Windows 98 SE, Windows ME, Windows 2000, Windows XP, Windows Vista, Windows 7 (64 bit), and Windows 8 (64 bit).

Download freeglut 3.0.0 for MSVC (with PGP signature and PGP key)

freeglut 3.0.0 MinGW Package

This package contains 32 and 64 bit Windows DLLs, import libraries, static libraries, and header files, allowing freeglut applications to be compiled using the MinGW compiler. The package was built from source code using MinGW. The DLL is binary compatible with both my MSVC DLL, and the GLUT for Win32 DLL provided by Nate Robins. The DLL has been tested on Windows 98 SE, Windows ME, Windows 2000, Windows XP, Windows Vista, Windows 7 (64 bit), and Windows 8 (64 bit).

The package should also work with the various IDEs which offer frontends to MinGW / gcc, for example Eclipse, Dev-C++, and Code::Blocks. However, you'll need to consult the manual for your IDE for instructions on how to do this.

Download freeglut 3.0.0 for MinGW (with PGP signature and PGP key)

For further details on using freeglut with MinGW, see my GLUT MinGW article.

VS2017

環境設定

Include目錄

程式庫目錄

執行第一支程式



○ 解壓縮freeglut.zip準備設定環境用

注意

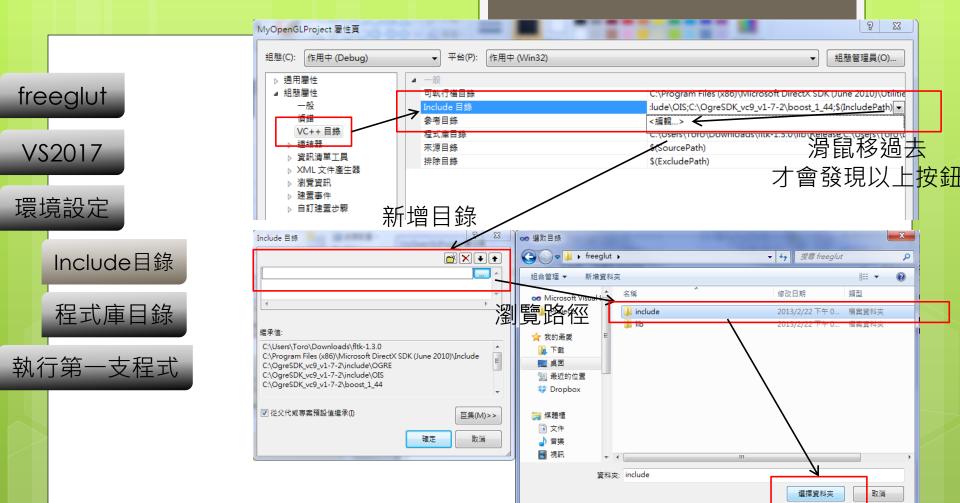
以下VS環境設置為Debug x86

若要編譯其他版本請用cmake





- 設定專案屬性
 - →找到MyOpenGLProject專案(專案名)
 - →滑鼠右鍵
 - →屬性



進入屬性後,找到VC++目錄點開它

- →編輯Include目錄
- →設定目錄,找到不久前下載的freeglut裡面有include
- →選擇資料夾

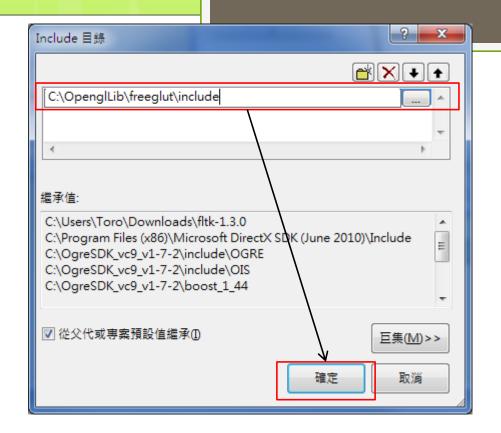
VS2017

環境設定

Include目錄

程式庫目錄

執行第一支程式



設定好include目錄的畫面,點選確定

[要求]

在C碟路徑下自創資料結存放freeglut檔案

Ex: C:\OpenglLib\freeglut...

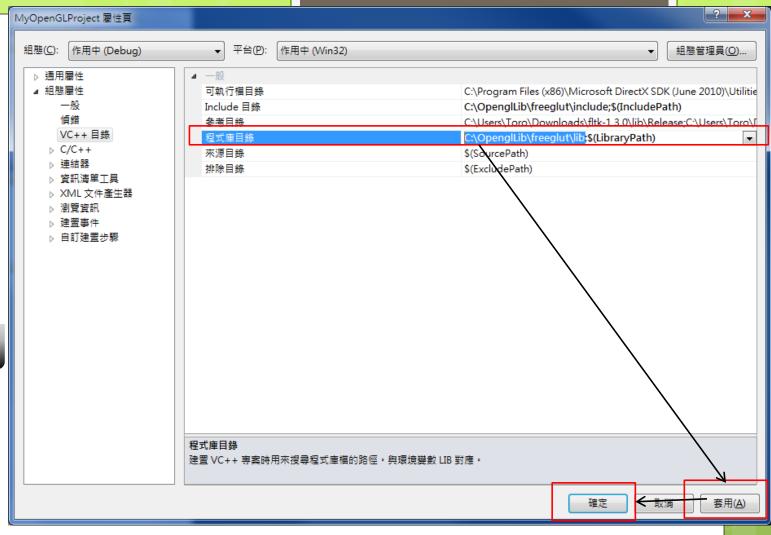
VS2017

環境設定

Include目錄

程式庫目錄

執行第一支程式

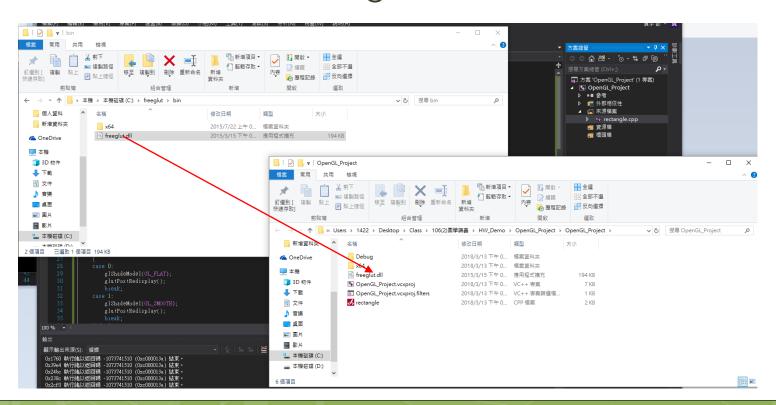


同樣操作模式,來設定「程式庫目錄」

→找到路徑freeglut的「lib」資料夾

缺少freeglut.dll之解決方法

○ 將bin資料夾裡的freeglut.dll複製到專案底下



執行測試第一個 OpenGL程式

VS2017

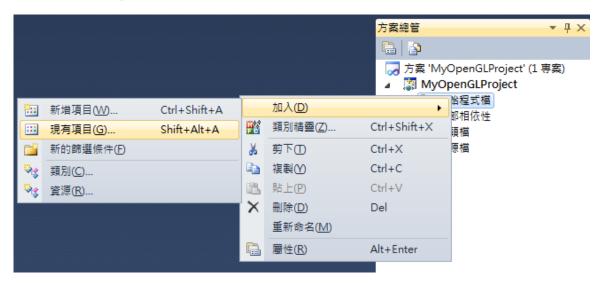
第一個OpenGL程式

環境設定

Include目錄

程式庫目錄

執行第一支程式



- 此時對原始程式檔點擊滑鼠右鍵
 - →加入 →現有項目→找到範例檔triangle.cpp
 - →點選加入

PS:標頭檔請 #include <GL/glut.h>

不要#include <glut.h>

• 執行結果

freeglut

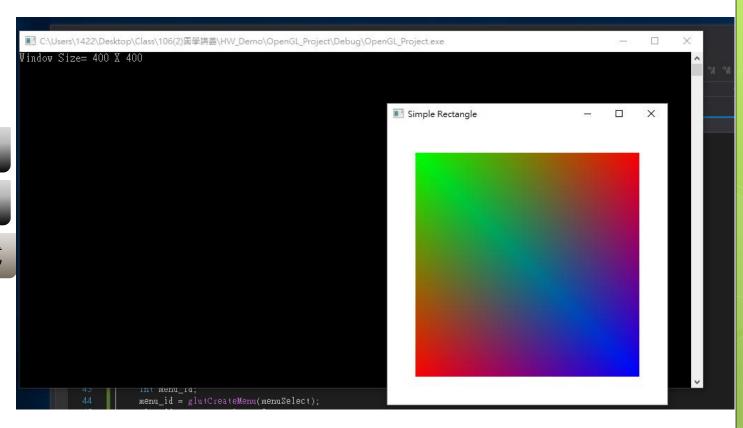
VS2017

環境設定

Include目錄

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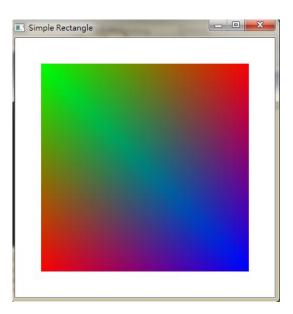
執行第一支程式



Exercise

Create a rectangle

glShadeModel(GL_SMOOTH);



參考資源

- ✓ OpenGL SuperBible 4th Edition
- ✓ OpenGL Programming Guide: The Official Guide to Learning OpenGL, Versions 3.0 and 3.1 (7th Edition)