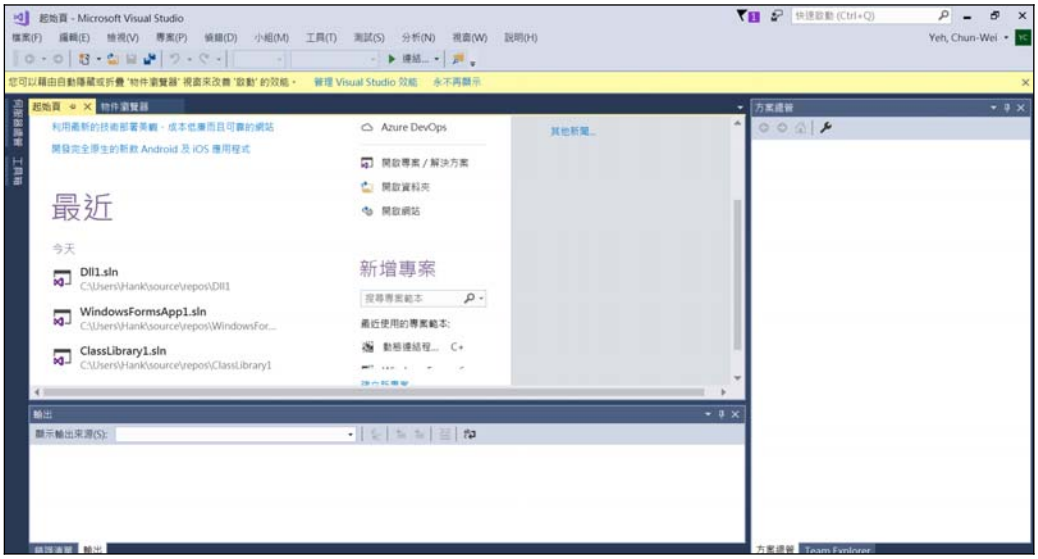
國立臺北科技大學自動化所 嵌入式工業機器視覺

Lab 5_Using P/Invoke for NImgProcess

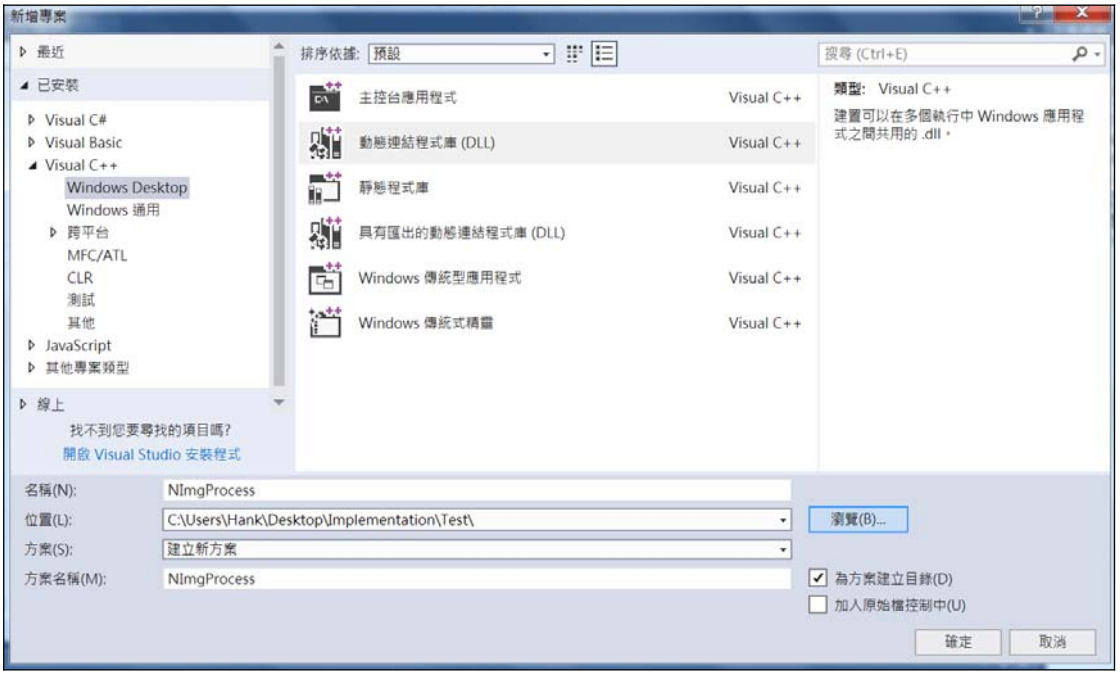
[Using P/Invoke for C++]

<u>The following steps describe how to create a dynamic library on Windows. These steps are for Microsoft Visual Studio 2017, although the steps are similar for other versions of Visual Studio.</u>

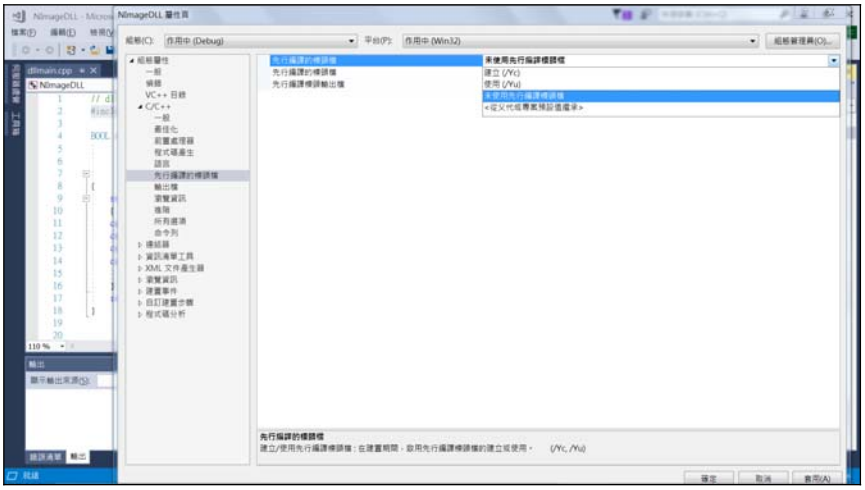
1. Select the menu File > New > Project



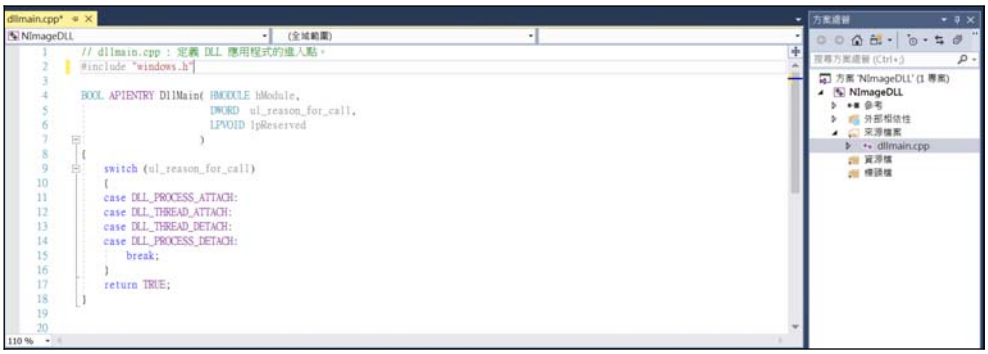
2. Select the Visual C++ -> Windows Desktop and the DLL option, and then put the project name and path.



3. Please follow the steps of **Lab 4** to cancel the option of header file pre-compiler. Press **[Alt+Enter]**.



Delete the files of **pch.cpp**, **pch.h** and **framework.h**, and then modify the #include “pch.h” becoming #include <windows.h> in dllmain.cpp as follows.



4. If you want the image processing functions to be callable from a DLL on Windows, you must explicitly mark its declaration. The designed **[NImgProcess.h]** and **[NImgProcessDLL.h]** provides a simple demonstration of this.

Note: we have provided the C-type functions of image processing **[Thresholding Src]** for students, an d then the class of NImgProcess being designed in this Lab by yourselves.

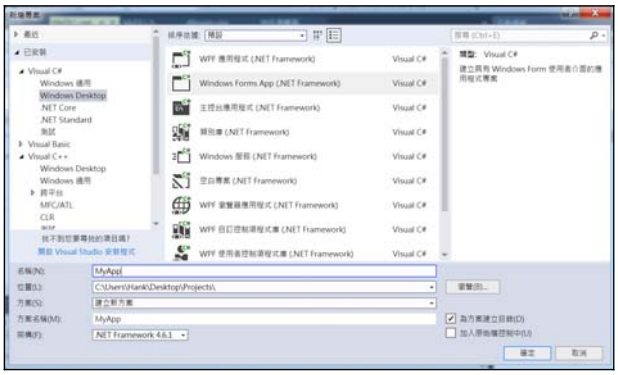
For Example:

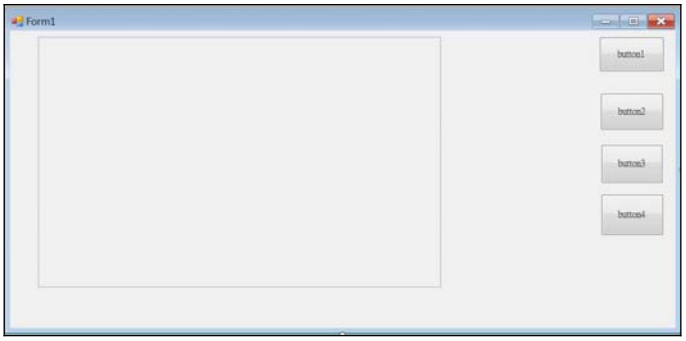
```
class NImgProcess
{
private:
        //member variables
        …
        //member functions:
        - GetImageParament()
        - Create2DList()
        - histog()
        - Release2DList()
        …
public:
        NImgProcess ();
        ~ NImgProcess ();
public:
        - Otsu()
        - KSW_Entropic ()
        - Moment ()
        - SingleThreshold()
};
```

5. You can then add new or existing source files **[NImage.h]**, **[NImgProcess.cpp]** and **[NImgProcessDLL.cpp]** to your project under the Source Files folder in the right-hand pane.

6. Build → Build Project (or **Build NImgProcessDLL**), and then Visual Studio will generate a **.dll file** and an associated **.lib import file**.

7. The man-machine interface, named MyApp, will be created by using C# to new four **[Button]**, a **[PictureBox]** and a **[OpenFileDialog]** as follows.

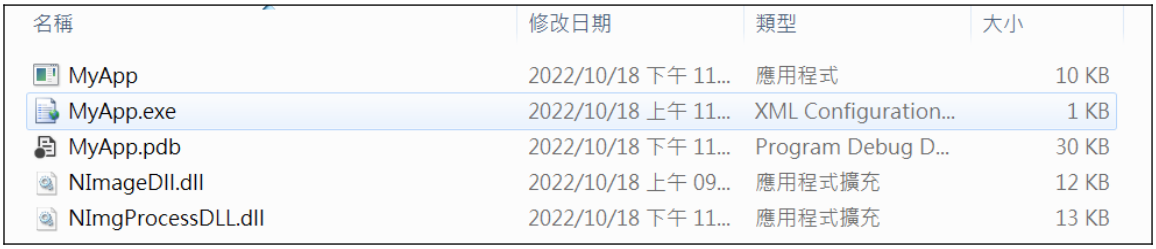




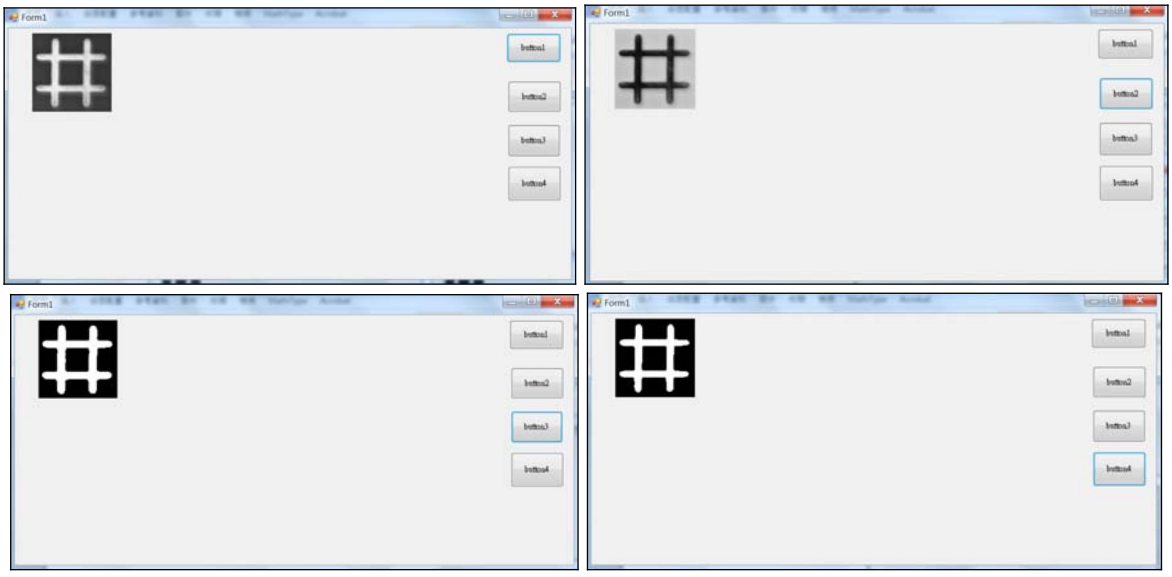
8. Add **[NImageDLL.cs] and [NImgProcessDLL.cs]** to MyApp C# project.

9. Call the functions in the events of Form1_FormClosing, buttion1_Click, buttion2_Click, buttion3_Click and buttion4_Click.

10. Build → **Build MyApp**, and copy the **[NImageDll.dll] and [NImgProcessDLL.dll]** files built in the Lab 4 and step 6, respectively to the folder of MyApp.exe. Now your MyApp.exe is executable to load an image and to process the image.



名稱	修改日期	類型	大小
MyApp	2022/10/18 下午 11...	應用程式	10 KB
MyApp.exe	2022/10/18 上午 11...	XML Configuration...	1 KB
MyApp.pdb	2022/10/18 下午 11...	Program Debug D...	30 KB
NImageDll.dll	2022/10/18 上午 09...	應用程式擴充	12 KB
NImgProcessDLL.dll	2022/10/18 下午 11...	應用程式擴充	13 KB



Exercises:

1. Please add the thresholding functions of KSW_Entropic and Moment to NImgProcess class.
2. Please add the new functions to the DLL files by using P/Invoke Technique.
3. Please add new button and textbox to the GUI.
4. Run the demo to verify your work.