

Image Processing Homework 1 Report

P76071137 王怡媛

一、Problems and Methods

- Q: 如何開啟 console mode

A: 在 using namespace 下插入此段程式碼

```
namespace Win32 {
    [DllImport("kernel32.dll", CallingConvention = CallingConvention::StdCall)]
    int AllocConsole();
    [DllImport("kernel32.dll", CallingConvention = CallingConvention::StdCall)]
    int FreeConsole();
}
```

在 Form1(void) function 插入

```
Win32::AllocConsole();
freopen("CONOUT$", "w", stdout);
```

- Q: 如何用 C++畫出 histogram

A: 利用內建的 Graphics 和 Pen

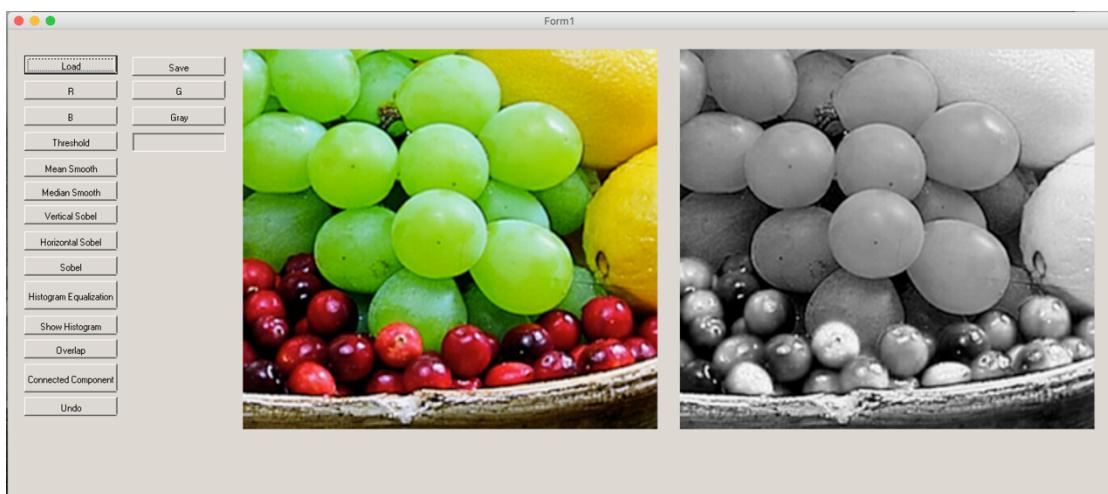
```
Bitmap^ result1 = gcnew Bitmap(300, 300);
Graphics^ g1 = Graphics::FromImage(result1);
g1->DrawLine(pen, 20, 20, 20, 280);
g1->DrawLine(pen, 20, 280, 280, 280);
```

- Q: 用 filter 做 smooth 時沒有 padding，會使影像變小

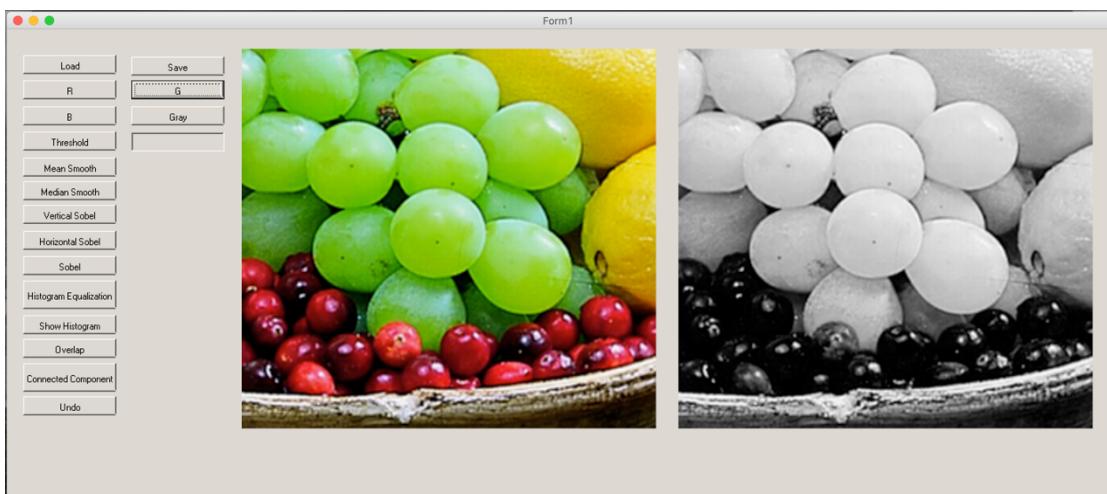
A: 直接在外圍補一圈白色的 pixels

二、Results

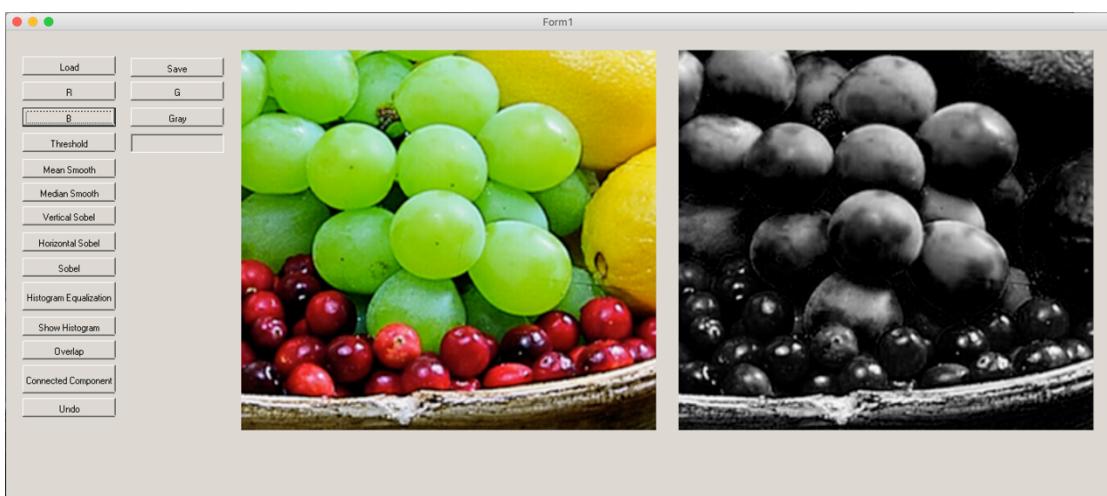
- Extract R channel



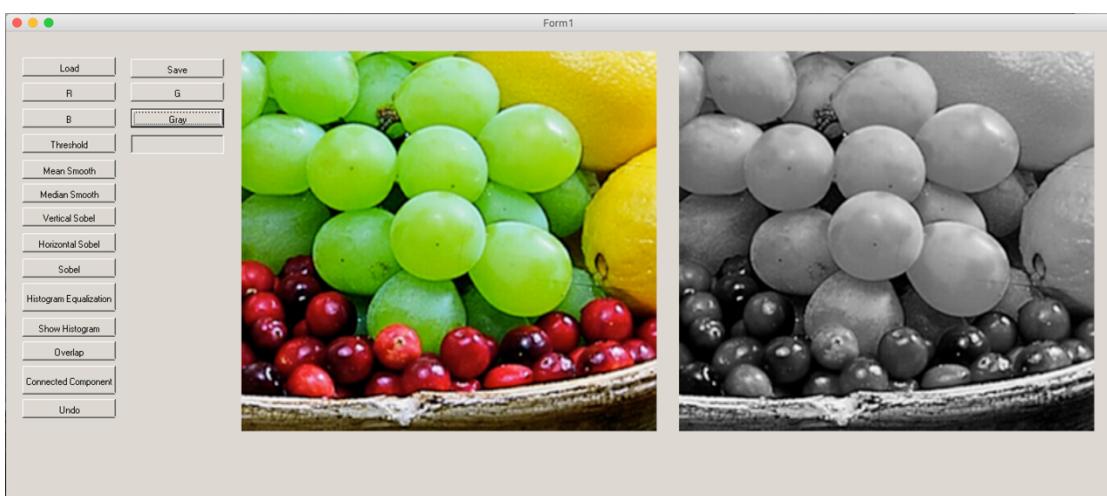
2. Extract G channel



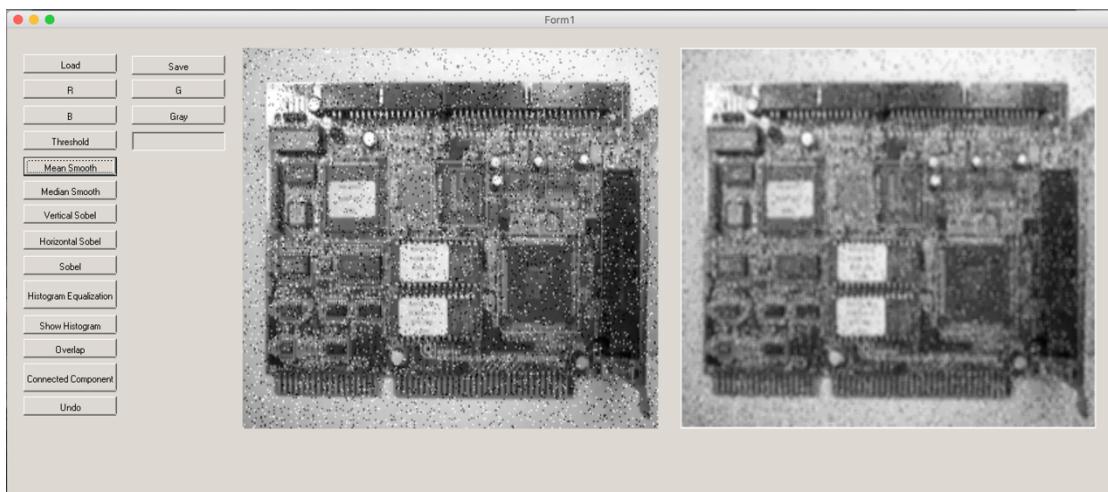
3. Extract B channel



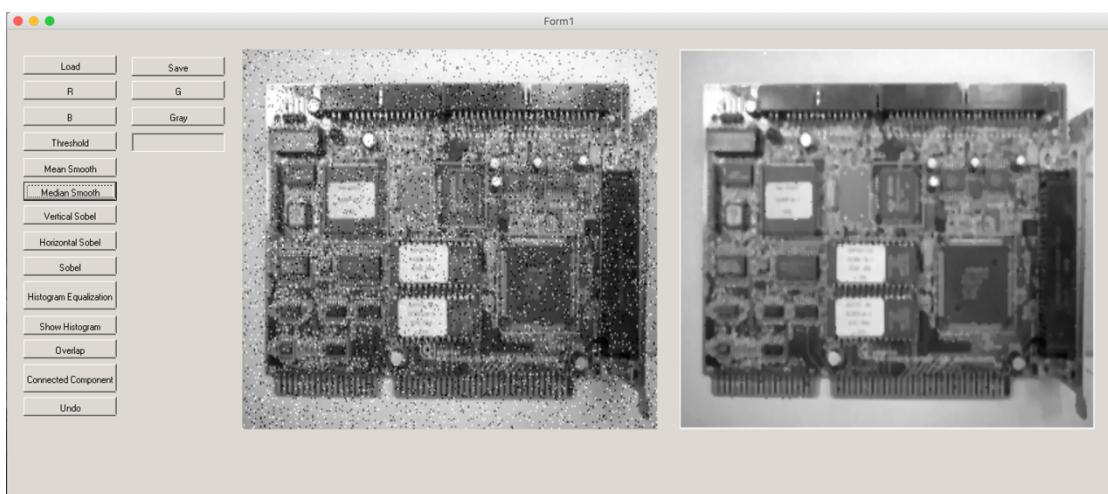
4. Change to gray scale image



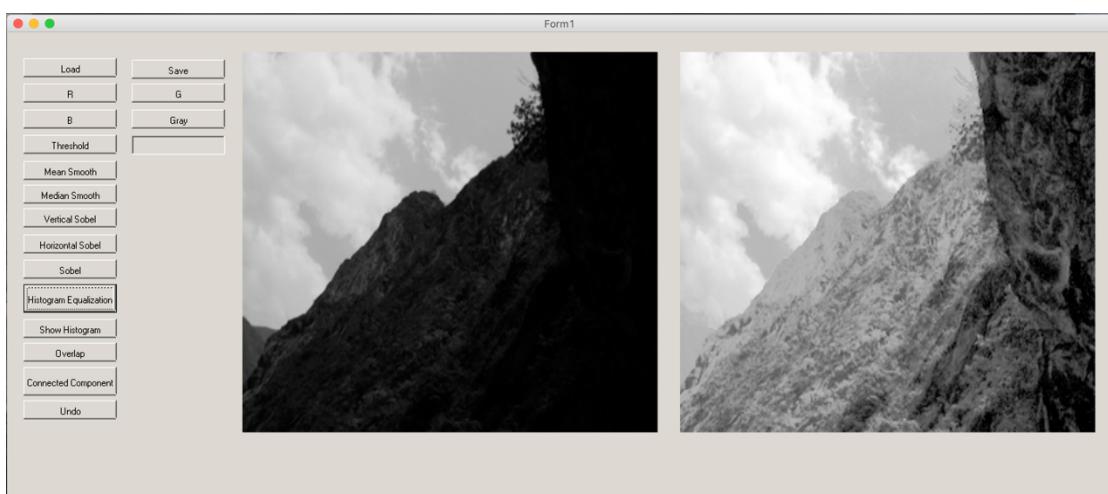
5. Mean smooth filter



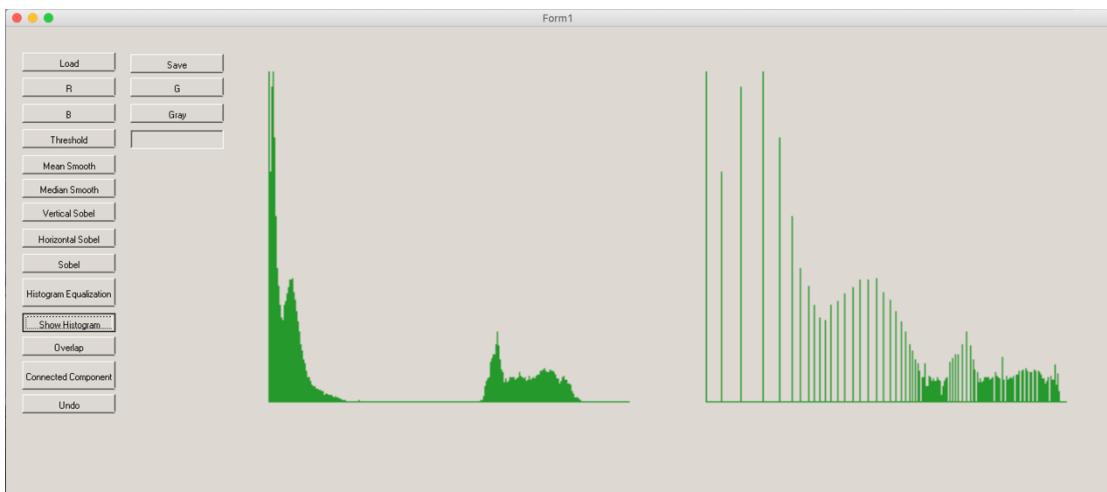
6. Median smooth filter



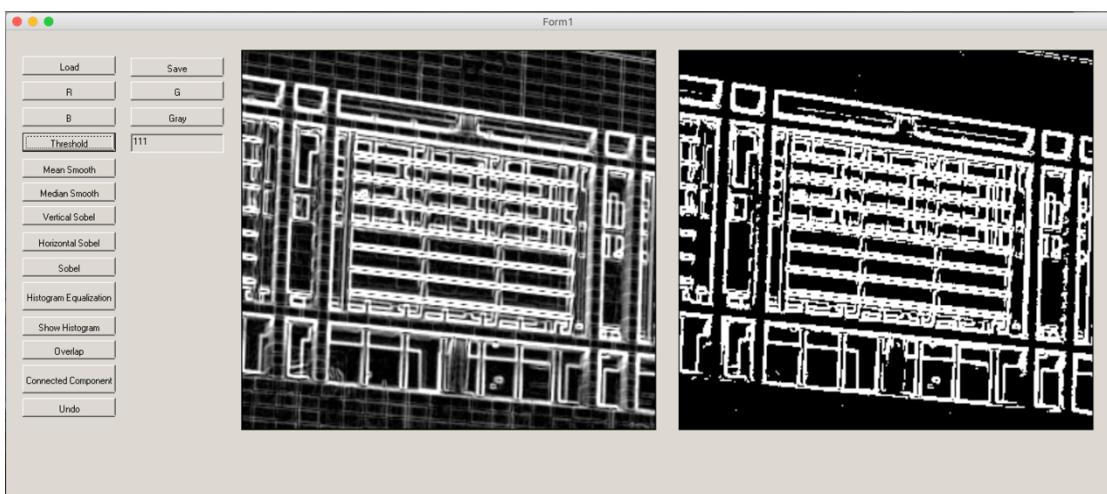
7. Histogram equalization



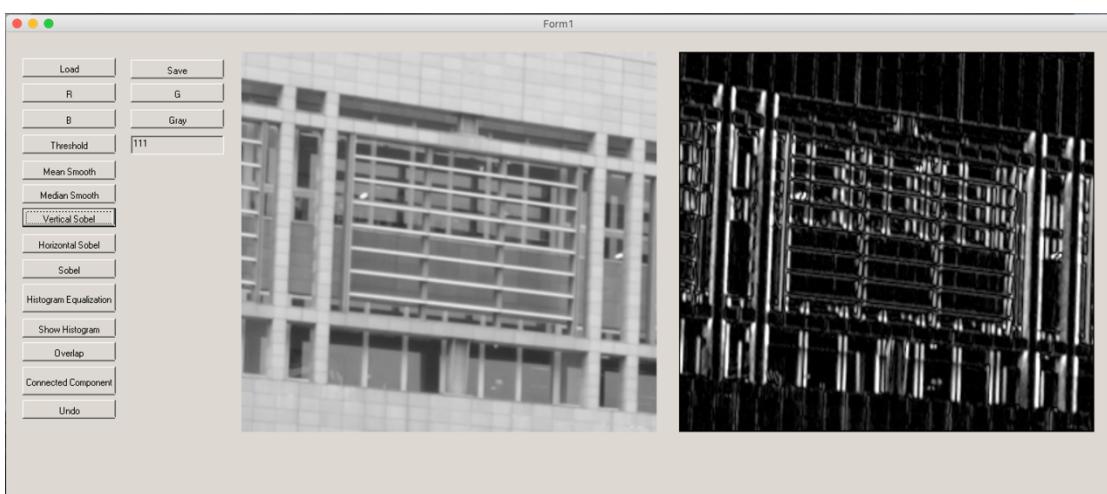
8. Display histogram



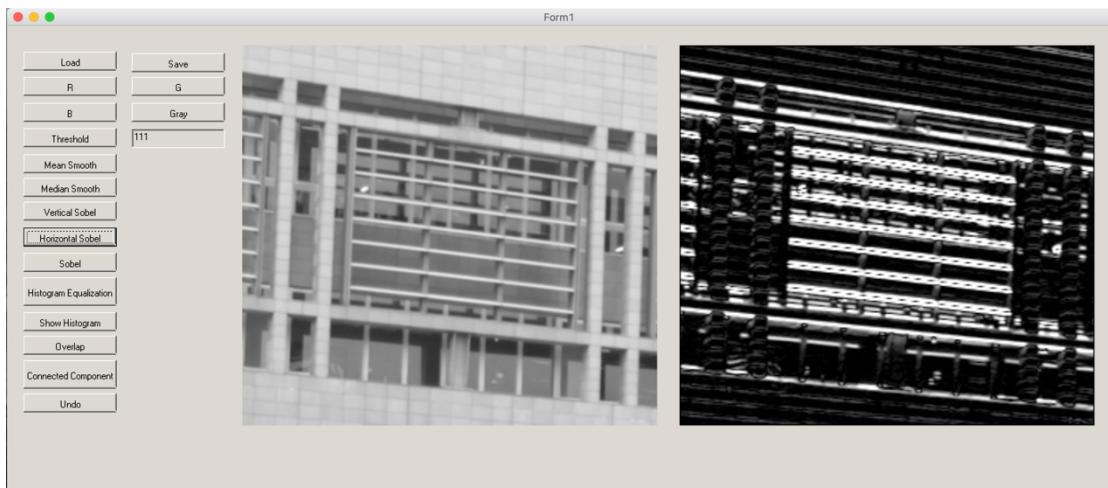
9. Thresholding



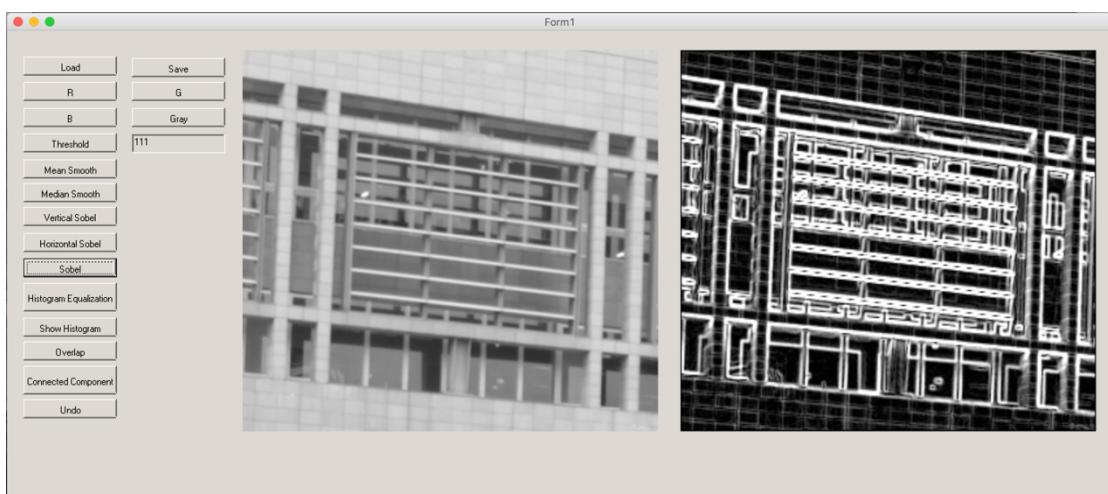
10. Vertical sobel edge detection



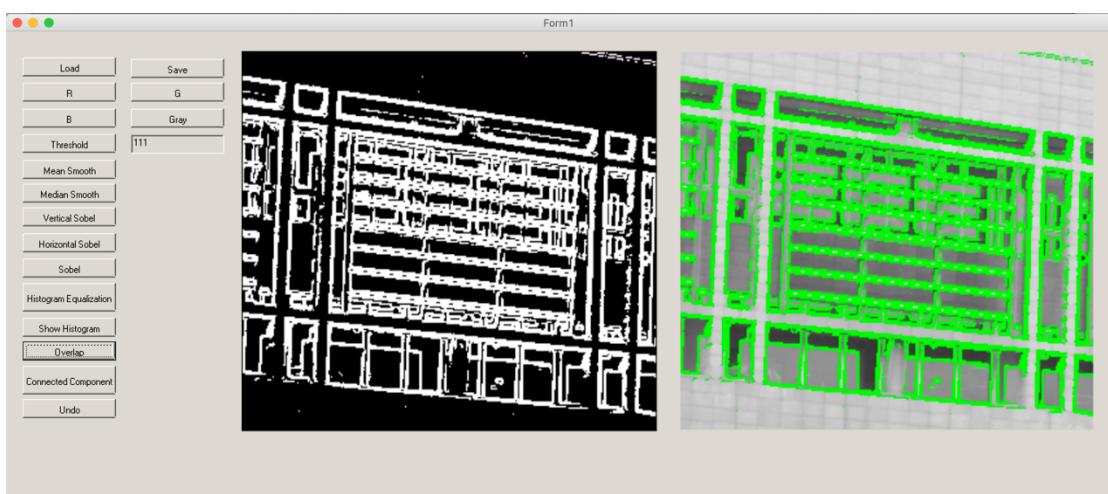
11. Horizontal sobel edge detection



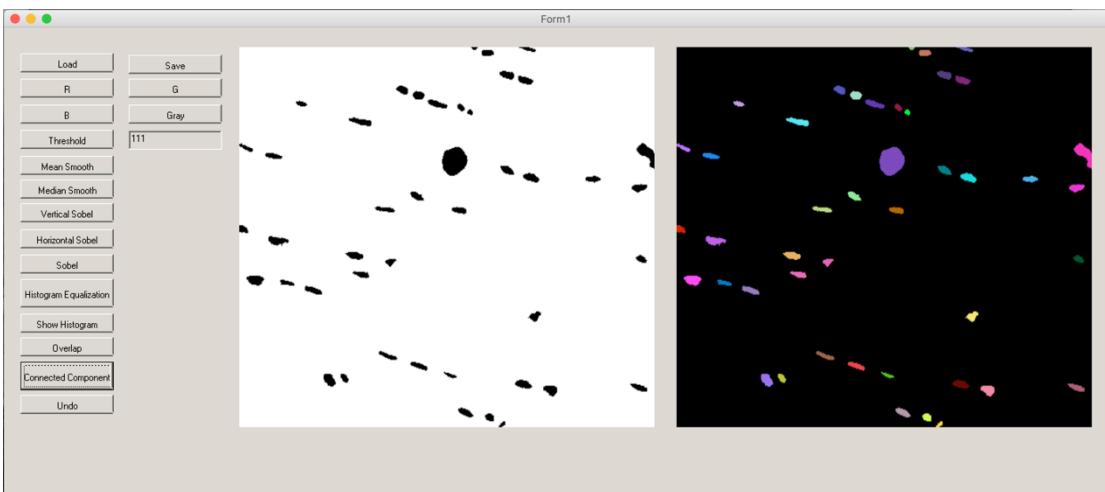
12. Combined sobel edge detection



13. Overlap



14. Connected Component



三、Discussion

這次的作業並沒有明確規定操作介面，因此一開始有點不確定要怎麼定義 button，猶豫是要一題一個 button 或是一個功能一個，後來因為需要做一個 Undo 的功能，所以猜測這次作業是要做一個影像編輯器，因此選擇一個功能一個 button。

另外 Display histogram 的部分，因為並不會再利用執行結果做後續的操作，所以我對 Display histogram 的 button 做了調整，當滑鼠按住時才會顯示，放開時就會立即回到之前的圖片。

四、Conclusion

由於作業規定不可使用 OpenCv 等套件，一開始以為會挺困難的，但是事實上並沒有想像中的那麼難，最多就是稍微麻煩一點，不過也透過了這次的實作，讓我更加了解這些影像處理基本方法的原理。