



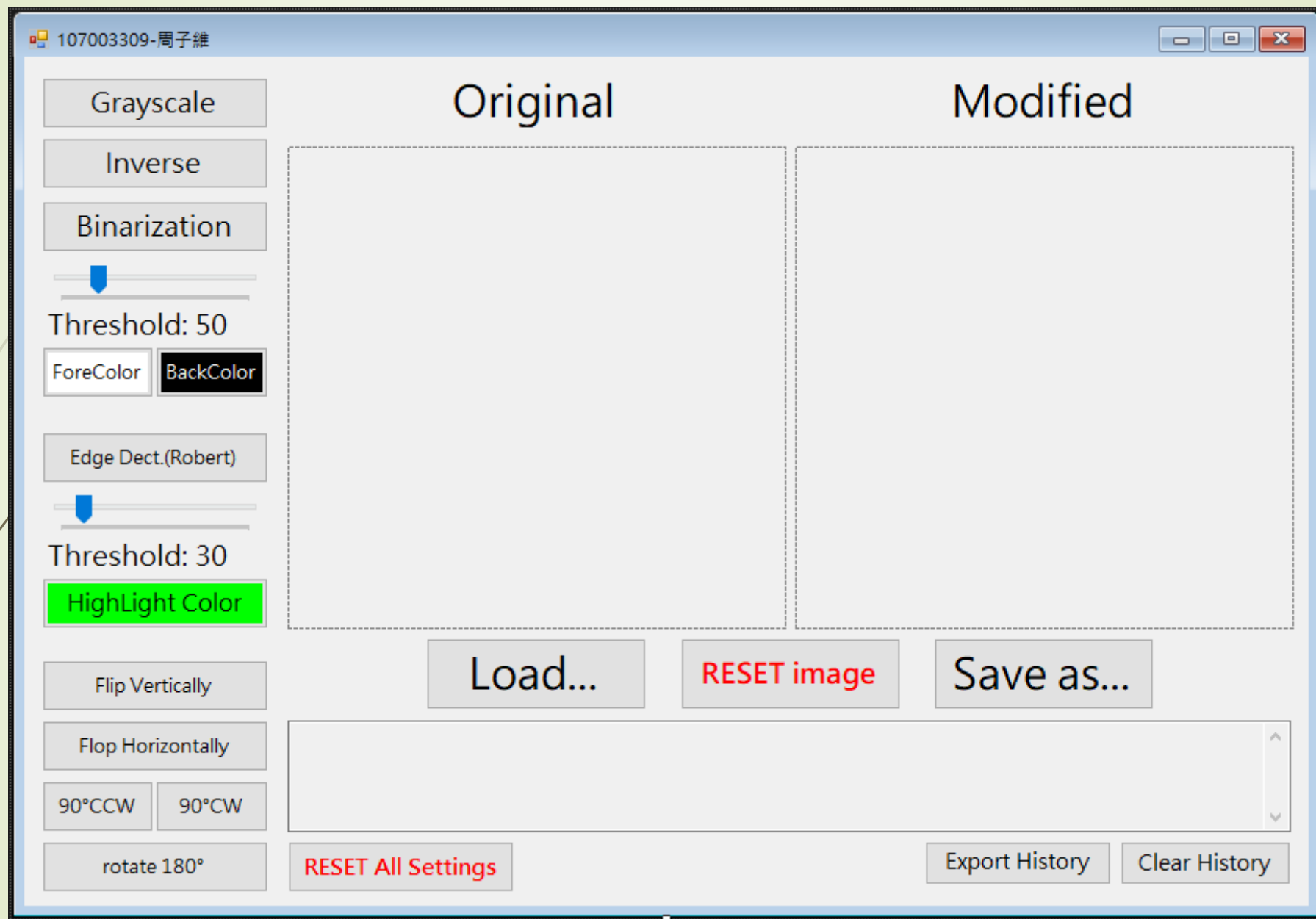
影像處理 - 期末報告

107003309 藥五甲 周子維

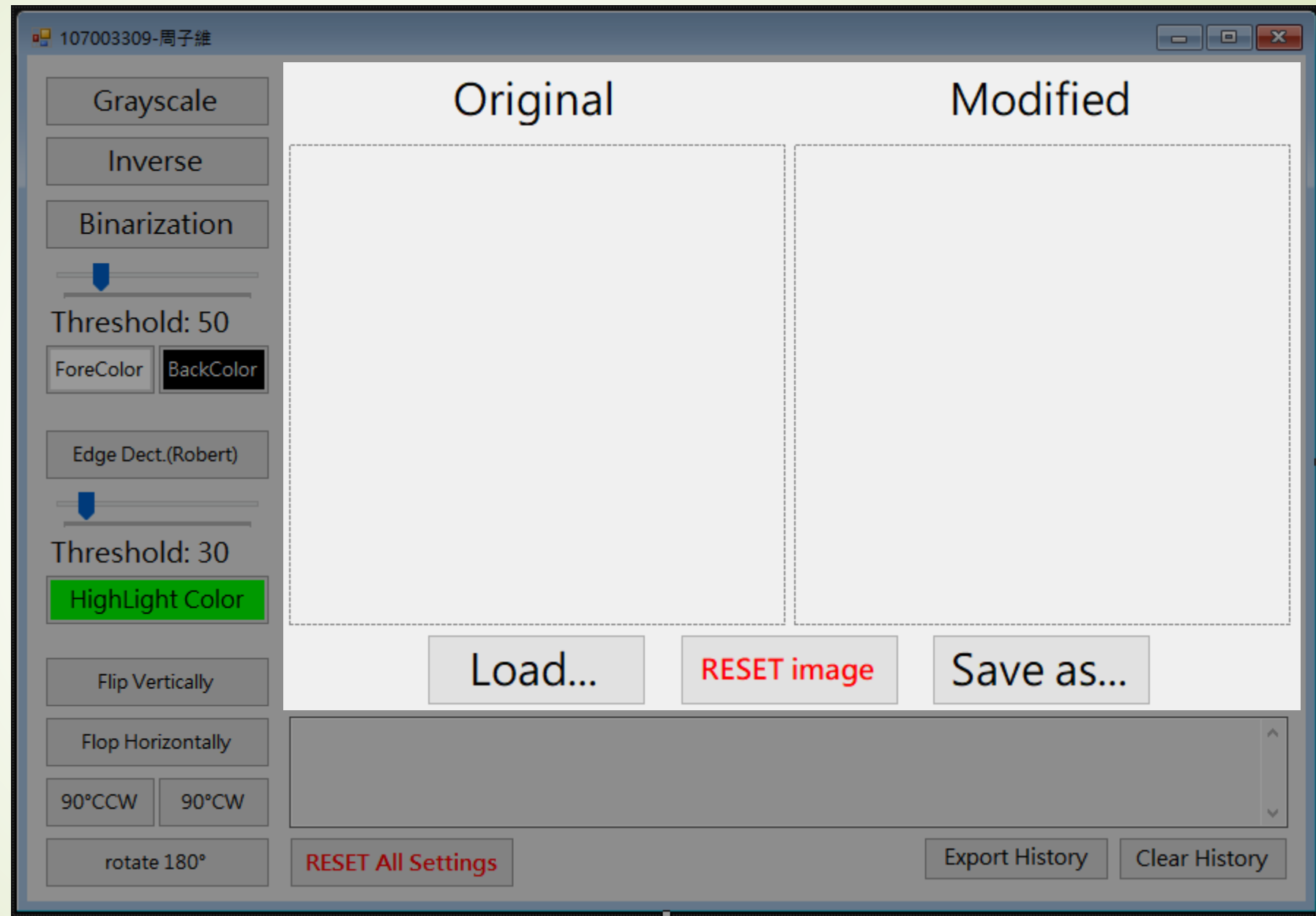
報告日期：2023/06/05 (Mon.)



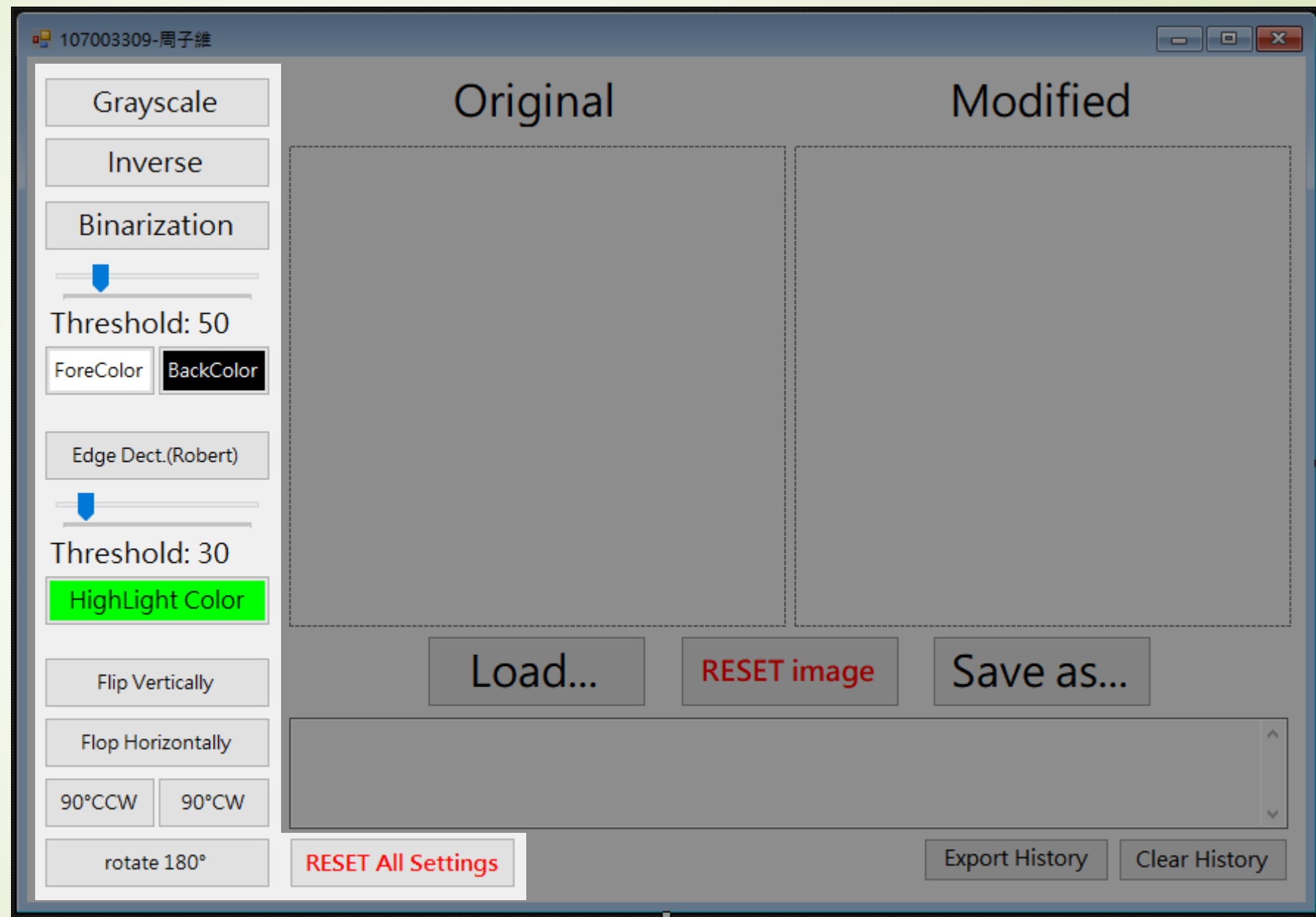
GUI-圖形化介面介紹



圖片顯示&儲存

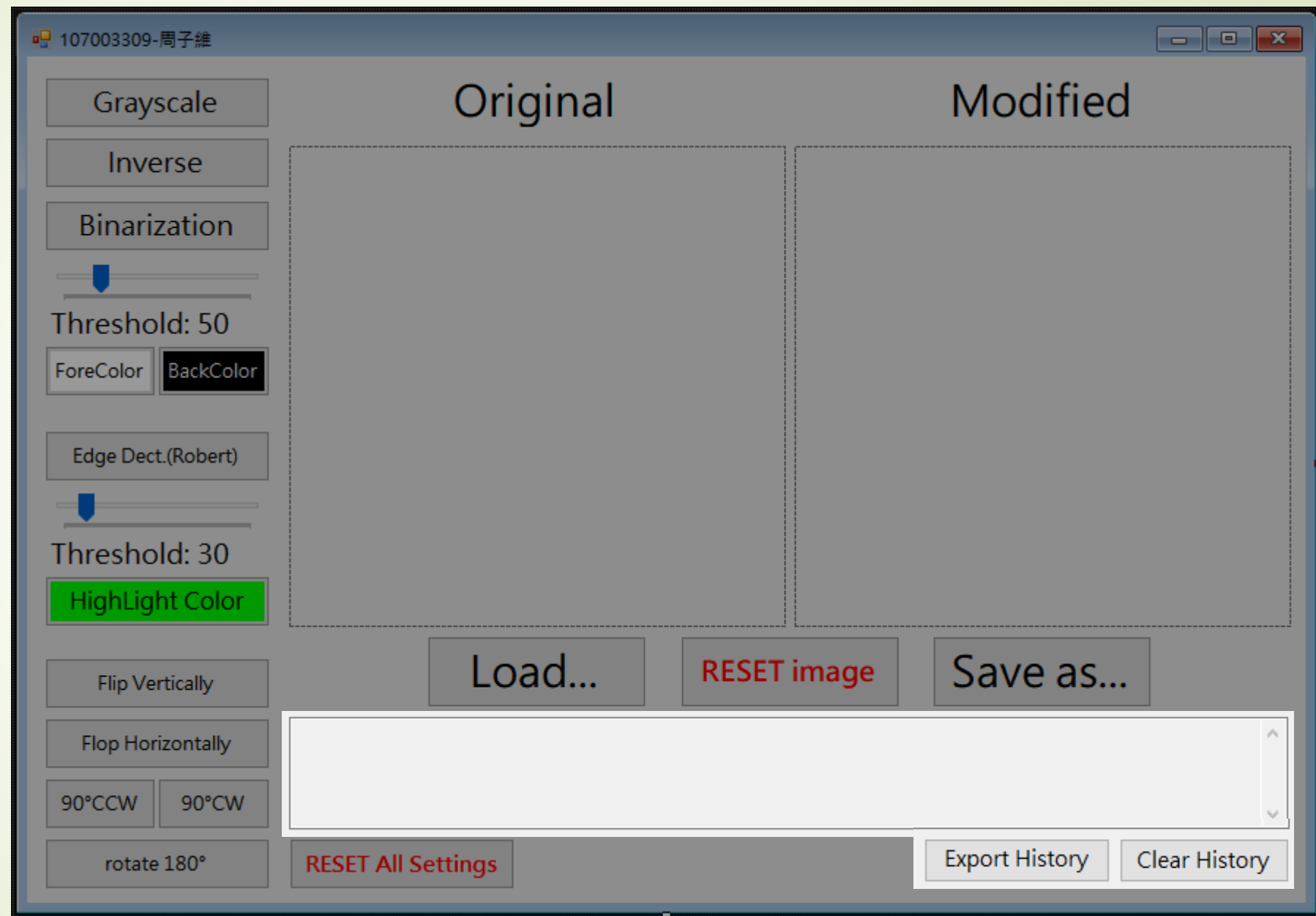


主要功能區

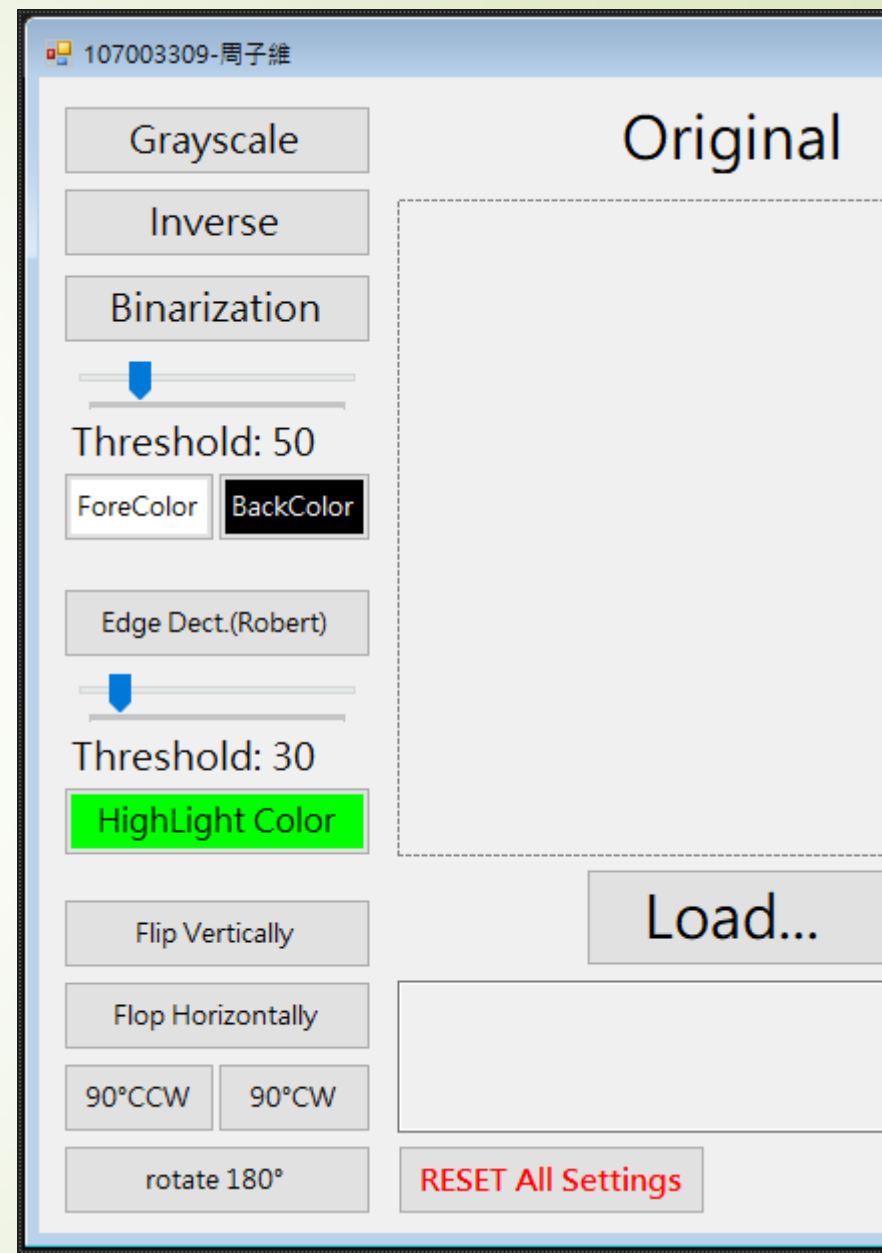


Verbose Log

→紀錄操作

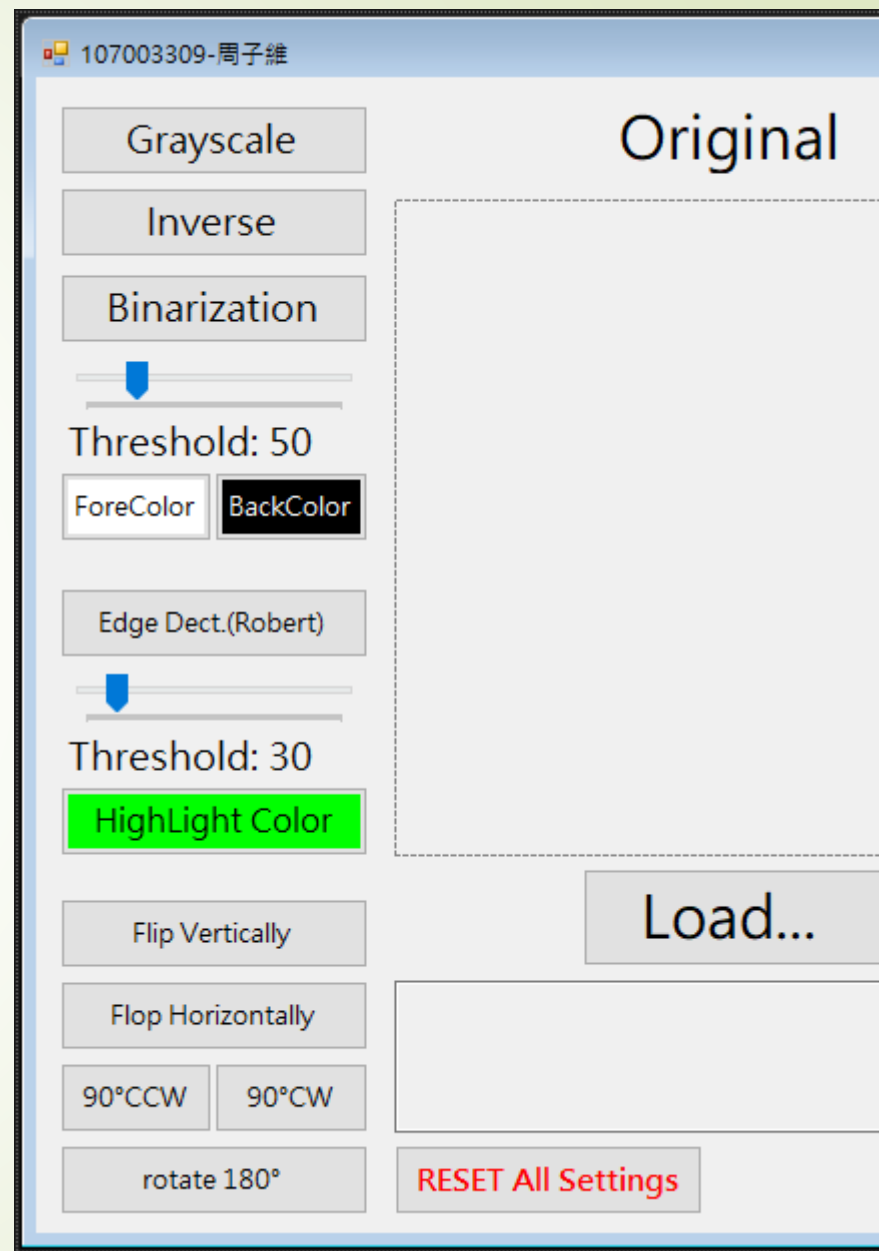


主要功能區



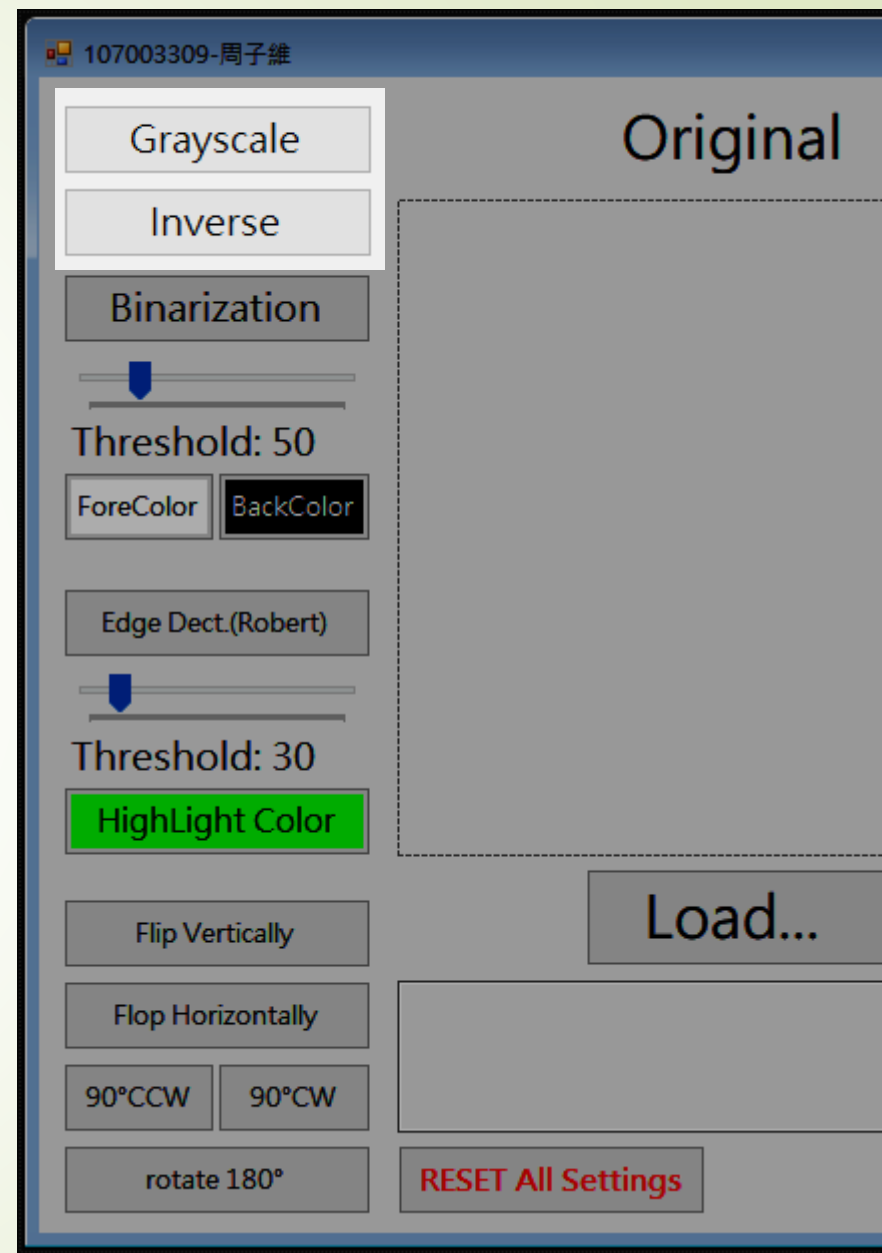
主要功能區

- 色彩變換(按下即生效，無其他設定)
 - Gray Scale(灰階)
 - Inverse color(色彩反轉)
- 色調強化 (track Bar 調整 threshold、自定義色彩)
 - Binarization(影像二值化)
 - Robert(影像邊緣偵測)
- 旋轉鏡像(按下即生效，無其他設定)
 - Flip Vertically(上下翻轉)
 - Flop Horizontally(左右翻轉)
 - 90 deg Clockwise rotation(順時針旋轉90度)
 - 90 deg Counter-Clockwise rotation(逆時針旋轉90度)
 - Rotate 180 deg(旋轉180度)



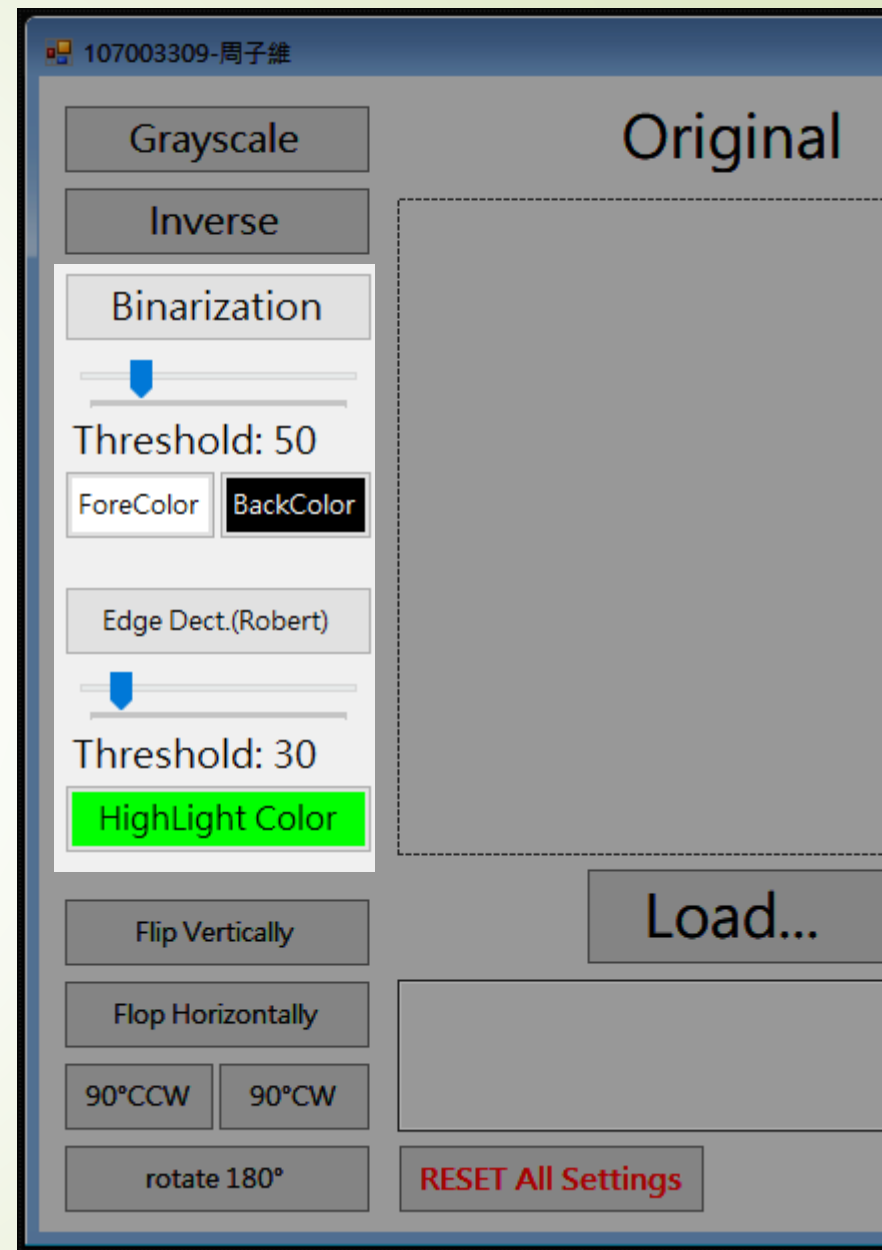
主要功能區

- 色彩變換(按下即生效，無其他設定)
 - Gray Scale(灰階)
 - Inverse color(色彩反轉)
- 色調強化 (track Bar 調整 threshold、自定義色彩)
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 - 90 deg Clockwise rotation(順時針旋轉90度)
 - 90 deg Counter-Clockwise rotation(逆時針旋轉90度)
 - Rotate 180 deg(旋轉180度)



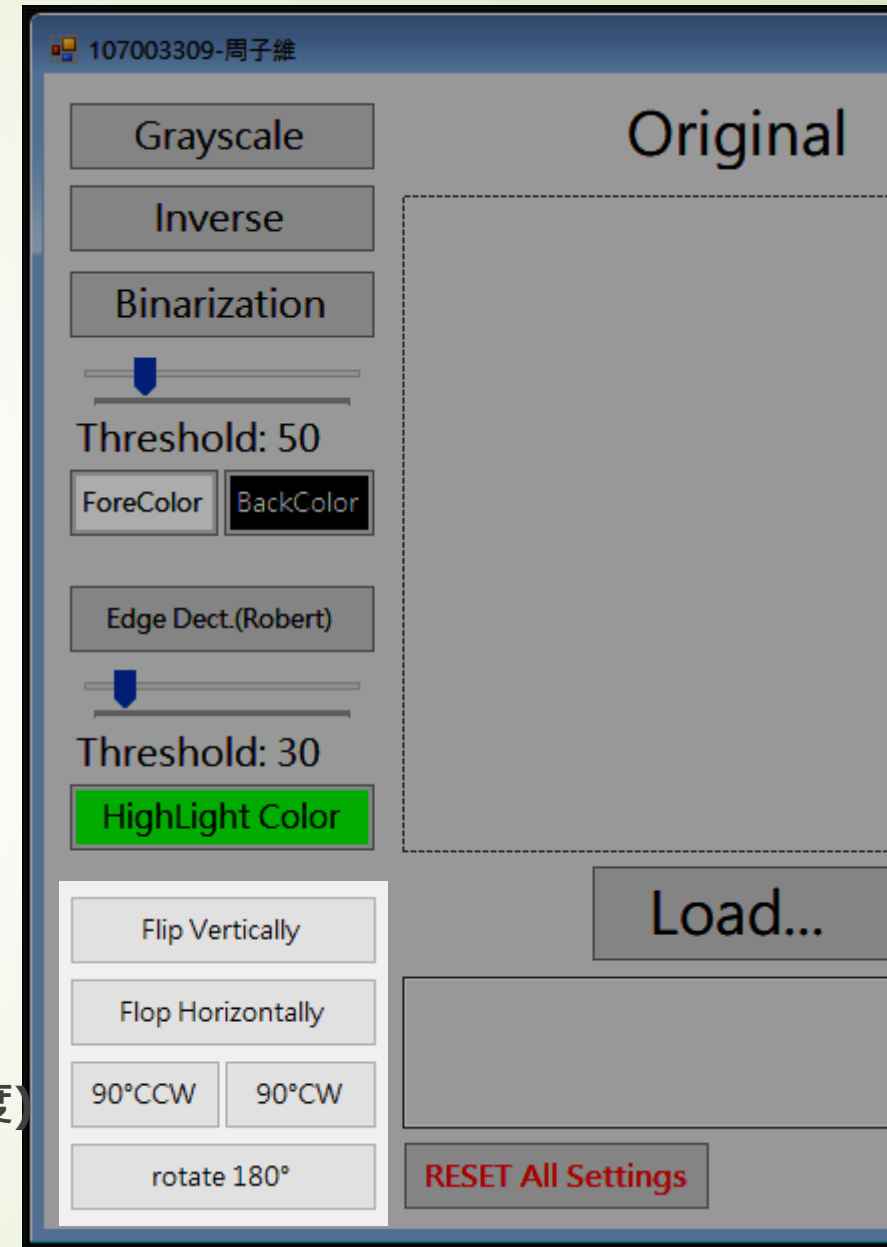
主要功能區

- 色彩變換(按下即生效，無其他設定)
 - Gray Scale(灰階)
 - Inverse color(色彩反轉)
- 色調強化 (track Bar 調整 threshold、自定義色彩)
 - Binarization(影像二值化)
 - Robert(影像邊緣偵測)
- 旋轉鏡像(按下即生效，無其他設定)
 - Flip Vertically(上下翻轉)
 - Flop Horizontally(左右翻轉)
 - 90 deg Clockwise rotation(順時針旋轉90度)
 - 90 deg Counter-Clockwise rotation(逆時針旋轉90度)
 - Rotate 180 deg(旋轉180度)



主要功能區

- 色彩變換(按下即生效，無其他設定)
 - Gray Scale(灰階)
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- 色調強化 (track Bar 調整 threshold、自定義色彩)
 - Binarization(影像二值化)
 - Robert(影像邊緣偵測)
- 旋轉鏡像(按下即生效，無其他設定)
 - Flip Vertically(上下翻轉)
 - Flop Horizontally(左右翻轉)
 - 90 deg Clockwise rotation(順時針旋轉90度)
 - 90 deg Counter-Clockwise rotation(逆時針旋轉90度)
 - Rotate 180 deg(旋轉180度)



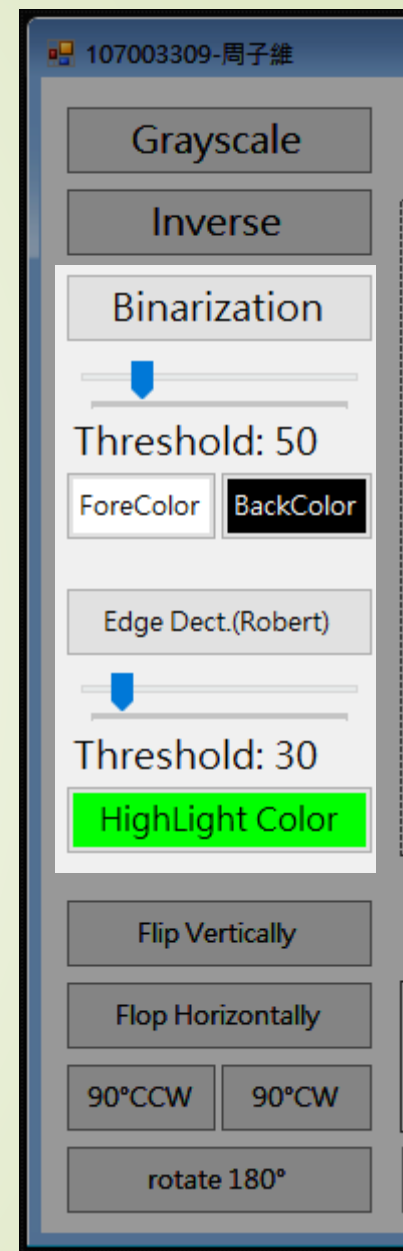
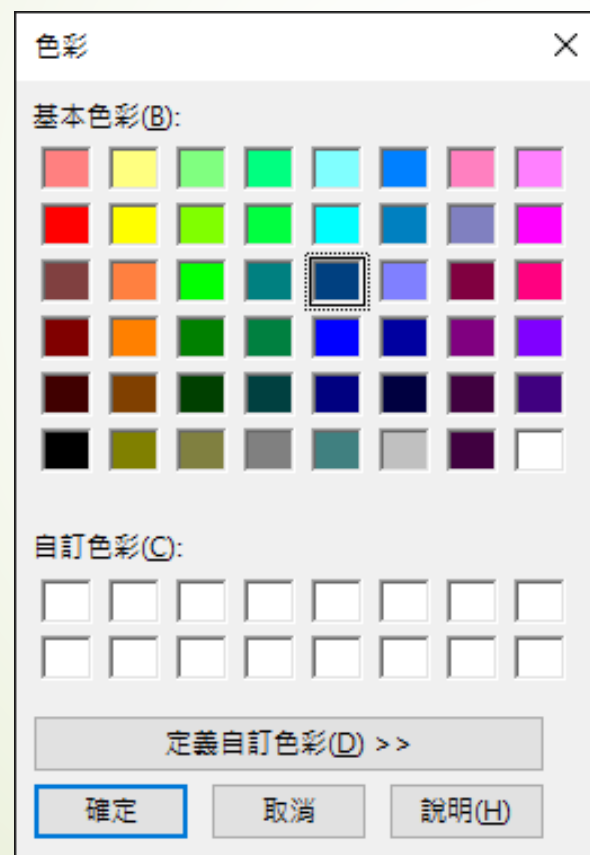
主要功能區-自定義色彩

ForeColor BackColor

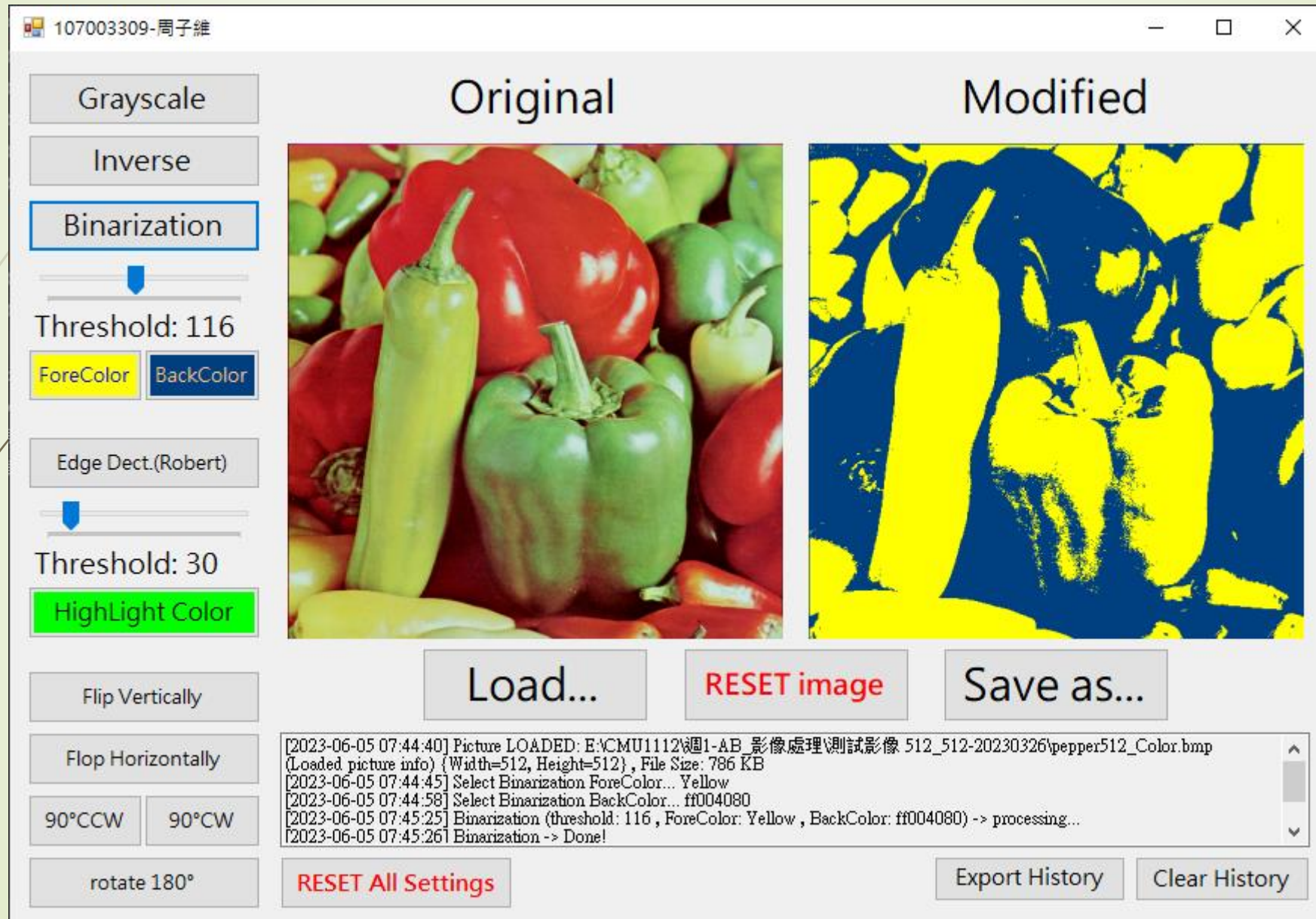
HighLight Color

ForeColor BackColor

HighLight Color



Binarization(影像二值化)-自訂色彩



RESET All Settings

Grayscale

Inverse

Binarization

Threshold: 118

ForeColor BackColor

Edge Dect.(Robert)

Threshold: 84

HighLight Color

Flip Vertically

Flop Horizontally

90°CCW 90°CW

rotate 180°

RESET All Settings



```
[2023-06-05 05:56:36] Rotating 90 degrees Clock Wise -> processing...  
[2023-06-05 05:56:36] Rotating 90 degrees Clock Wise -> Done!  
[2023-06-05 05:56:44] Select Edge Detection HighLight Color... ffff8040  
[2023-06-05 05:57:16] Reset all settings
```

Grayscale

Inverse

Binarization

Threshold: 50

ForeColor BackColor

Edge Dect.(Robert)

Threshold: 30

HighLight Color

Flip Vertically

Flop Horizontally

90°CCW 90°CW

rotate 180°



Verbose Log

記錄使用者操作紀錄

RESET All Settings

Export History

Clear History

Load(讀取圖片)

Load...

RESET image

Save as...

[2023-06-05 07:53:37] Picture LOADED: E:\CMU1112\週1-AB_影像處理\測試影像 512_512-20230326\Lena_512_Color.jpg
(Loaded picture info) {Width=512, Height=512}, File Size: 786 KB

Save(儲存圖片)

Load...

RESET image

Save as...

[2023-06-05 07:53:37] Picture LOADED: E:\CMU1112\週1-AB_影像處理\測試影像 512_512-20230326\Lena_512_Color.jpg
(Loaded picture info) {Width=512, Height=512}, File Size: 786 KB
[2023-06-05 07:54:44] Picture SAVED: E:\CMU1112\週1-AB_影像處理\測試影像 512_512-20230326\output.jpg
(Saved picture info) {Width=512, Height=512}, File Size: 786 KB

無其他設定：Gray Scale、Inverse、Rotate...

```
[2023-06-05 05:38:31] Picture LOADED: E:\CMU1112\週1-AB_影像處理\測試影像 512_512-20230326\pepper512_Color.bmp  
(Loaded picture info) {Width=512, Height=512}, File Size: 786 KB
```

```
[2023-06-05 05:38:44] Grayscale -> processing...
```

```
[2023-06-05 05:38:44] Grayscale -> Done!
```

包含其他參數：Binarization、Edge Dect.(Robert)

```
[2023-06-05 07:44:40] Picture LOADED: E:\CMU1112\週1-AB_影像處理\測試影像 512_512-20230326\pepper512_Color.bmp  
(Loaded picture info) {Width=512, Height=512}, File Size: 786 KB
```

```
[2023-06-05 07:44:45] Select Binarization ForeColor... Yellow
```

```
[2023-06-05 07:44:58] Select Binarization BackColor... ff004080
```

```
[2023-06-05 07:45:25] Binarization (threshold: 116, ForeColor: Yellow, BackColor: ff004080) -> processing...
```

```
[2023-06-05 07:45:26] Binarization -> Done!
```

顯示使用者選擇色彩

[2023-06-05 08:09:23] Select Binarization BackColor. ff004080

使用者未顯示顏色→顯示目前色彩

[2023-06-05 08:10:19] Select Binarization ForeColor. Cancel (current: White)



Export Verbose Log History

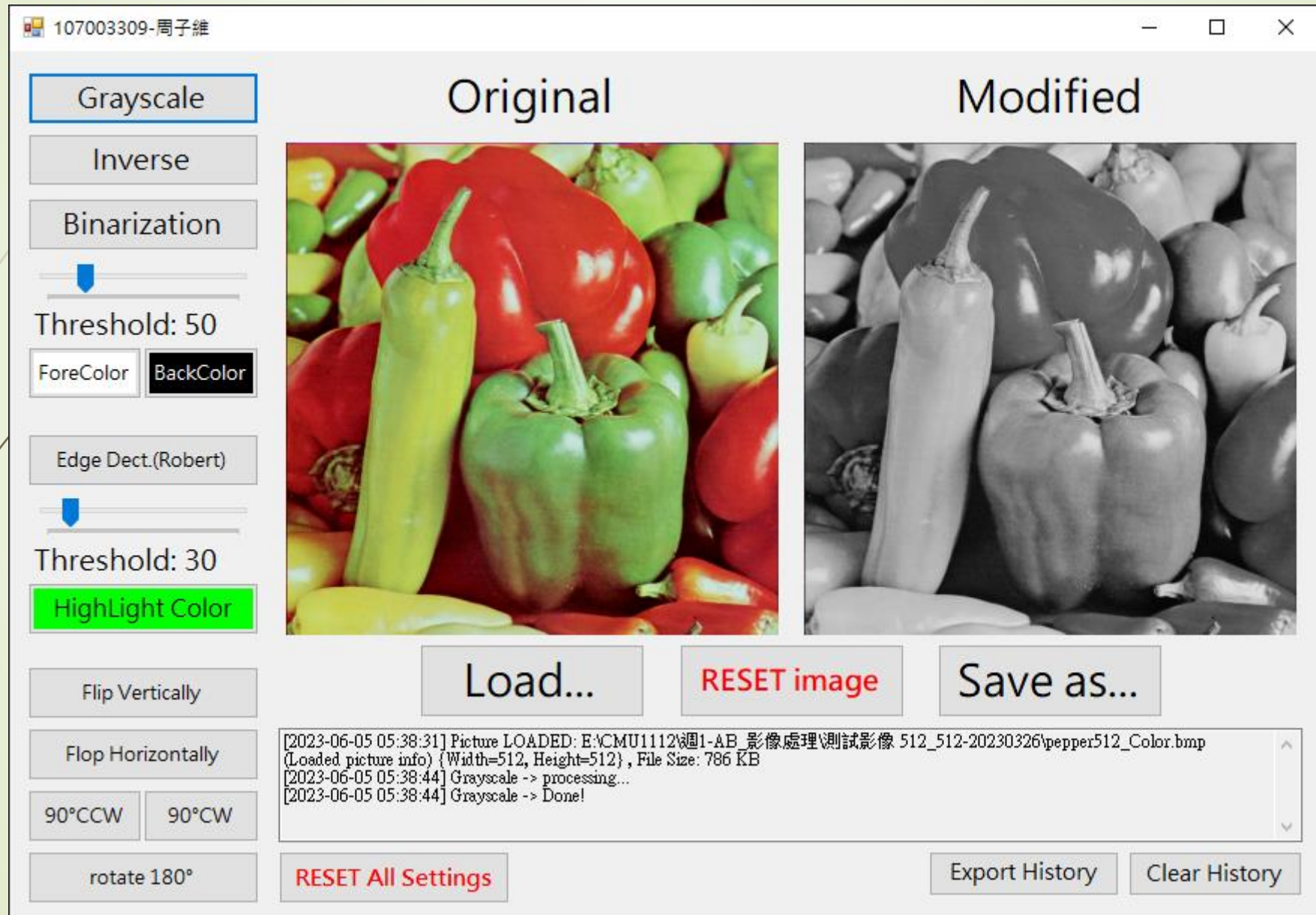


```
output_history.txt - 記事本
檔案(F) 編輯(E) 格式(O) 檢視(V) 說明
[2023-06-05 08:33:14] Picture LOADED: E:\CMU1112\週1-AB_影像處理\測試影像 512_512-
20230326\Lena_512_Color.jpg
(Loaded picture info) {Width=512, Height=512} , File Size: 786 KB
[2023-06-05 08:33:40] Flip Vertically -> processing...
[2023-06-05 08:33:41] Flip Vertically -> Done!
[2023-06-05 08:33:45] Rotating 90 degrees ClockWise -> processing...
[2023-06-05 08:33:45] Rotating 90 degrees ClockWise -> Done!
[2023-06-05 08:34:07] Select Edge Detection HighLight Color... Cancel (current: Lime)
[2023-06-05 08:34:16] Robert - Edge Detection (threshold: 76 , HighLightColor: Lime) -> processing...
[2023-06-05 08:34:17] Robert - Edge Detection -> Done!
第 1 列, 第 1 行 100% Windows (CRLF) UTF-8
```

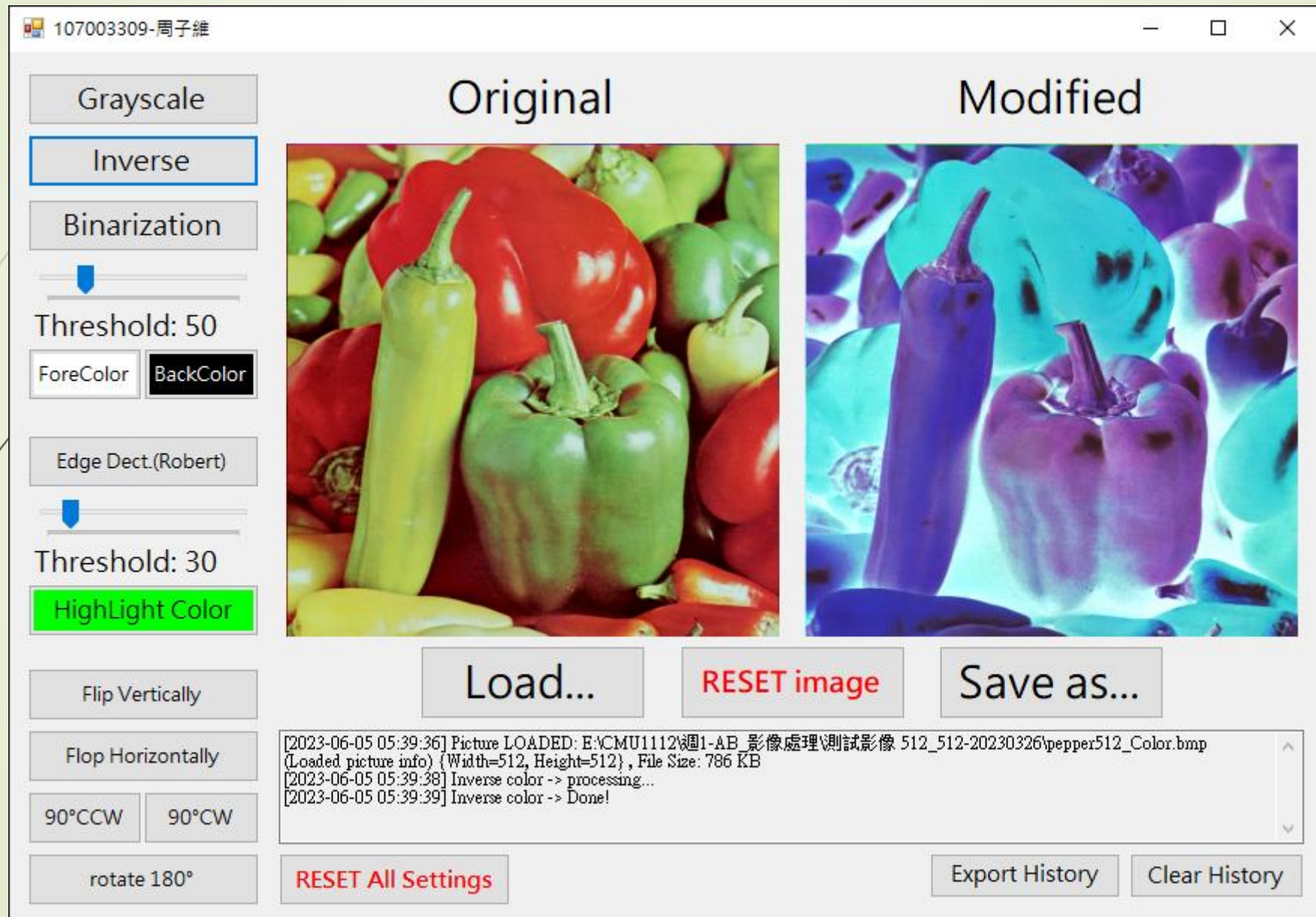


實際操作畫面

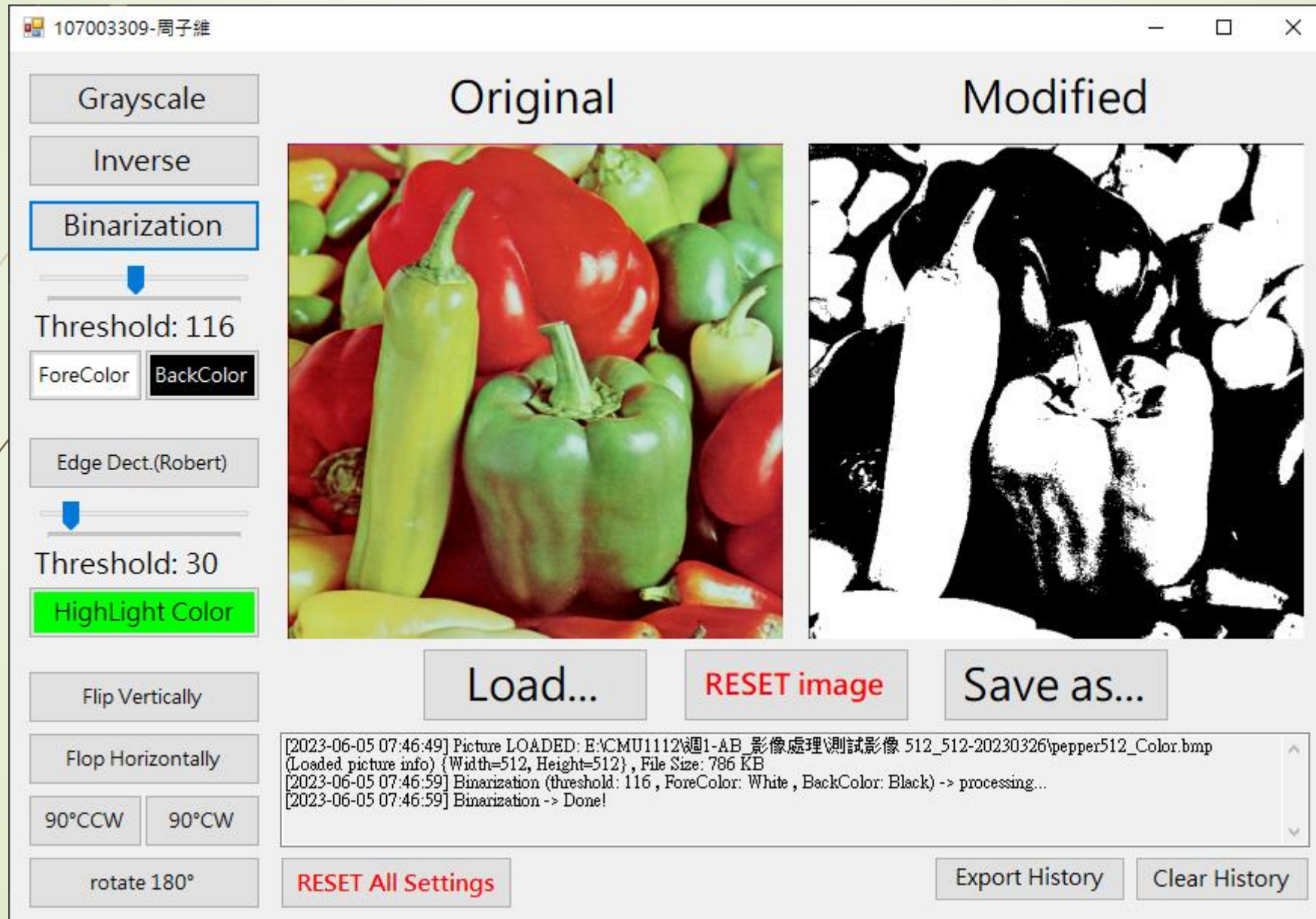
GrayScale(灰階)



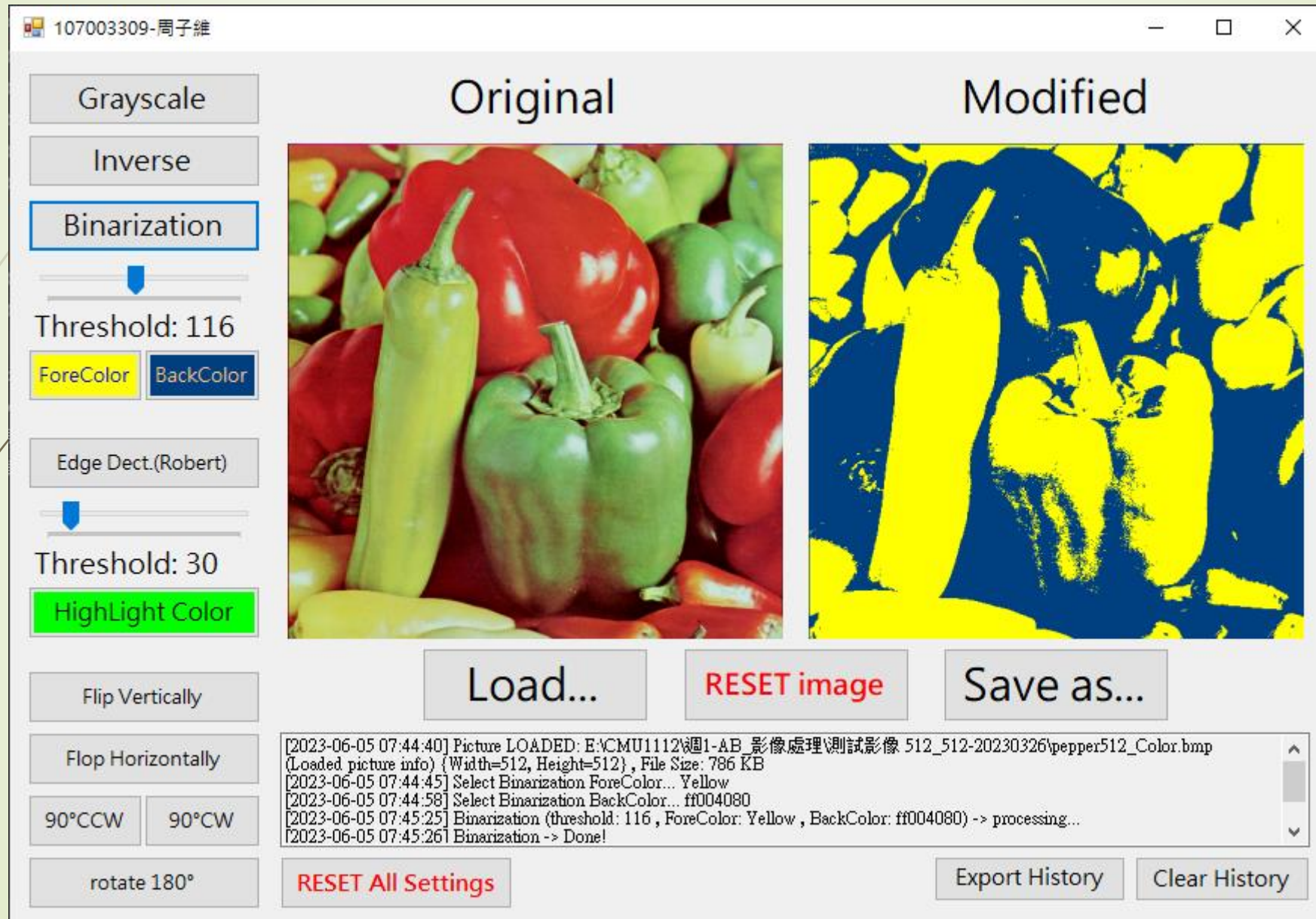
Inverse color(色彩反轉)



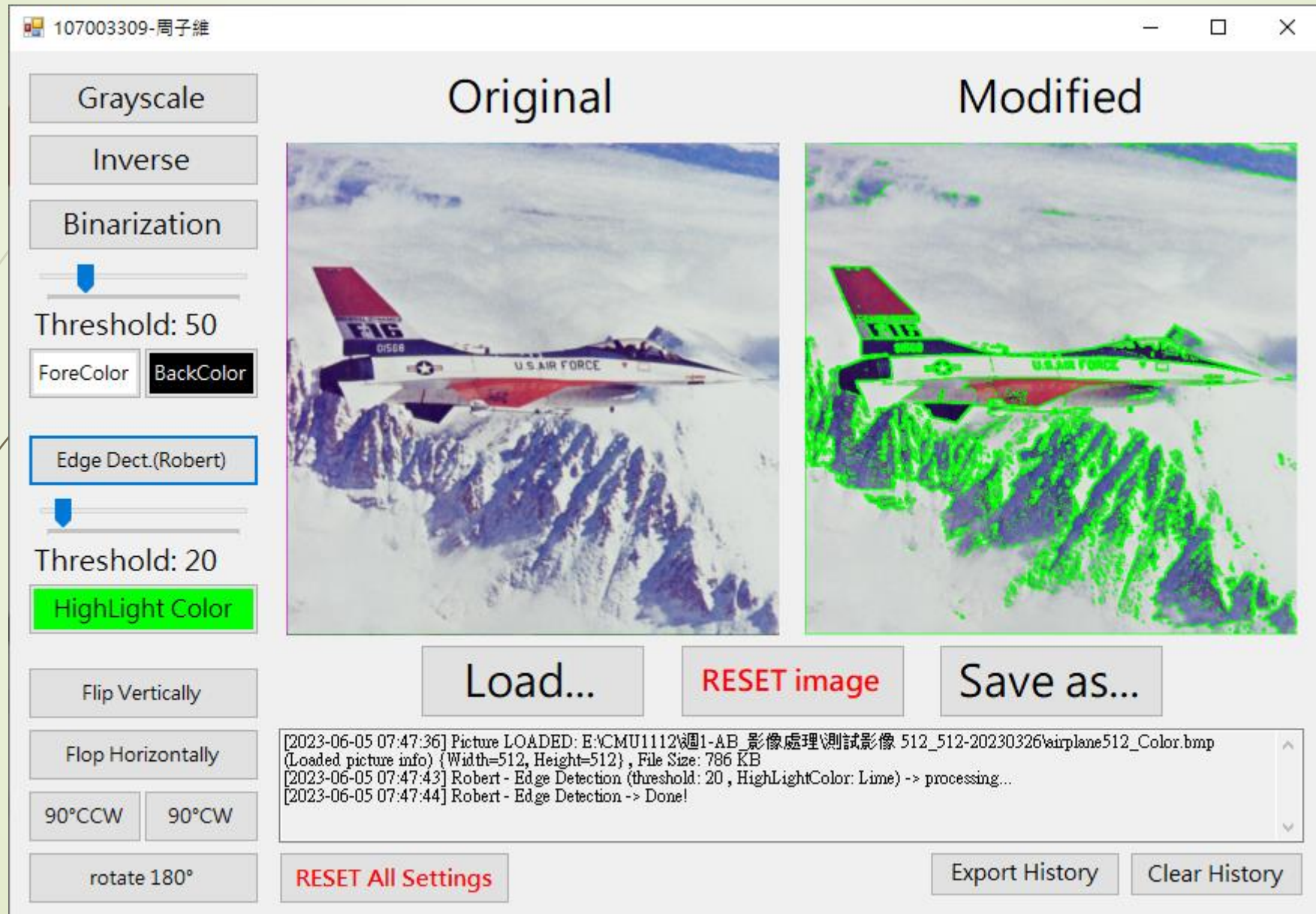
Binarization(影像二值化)-預設色彩



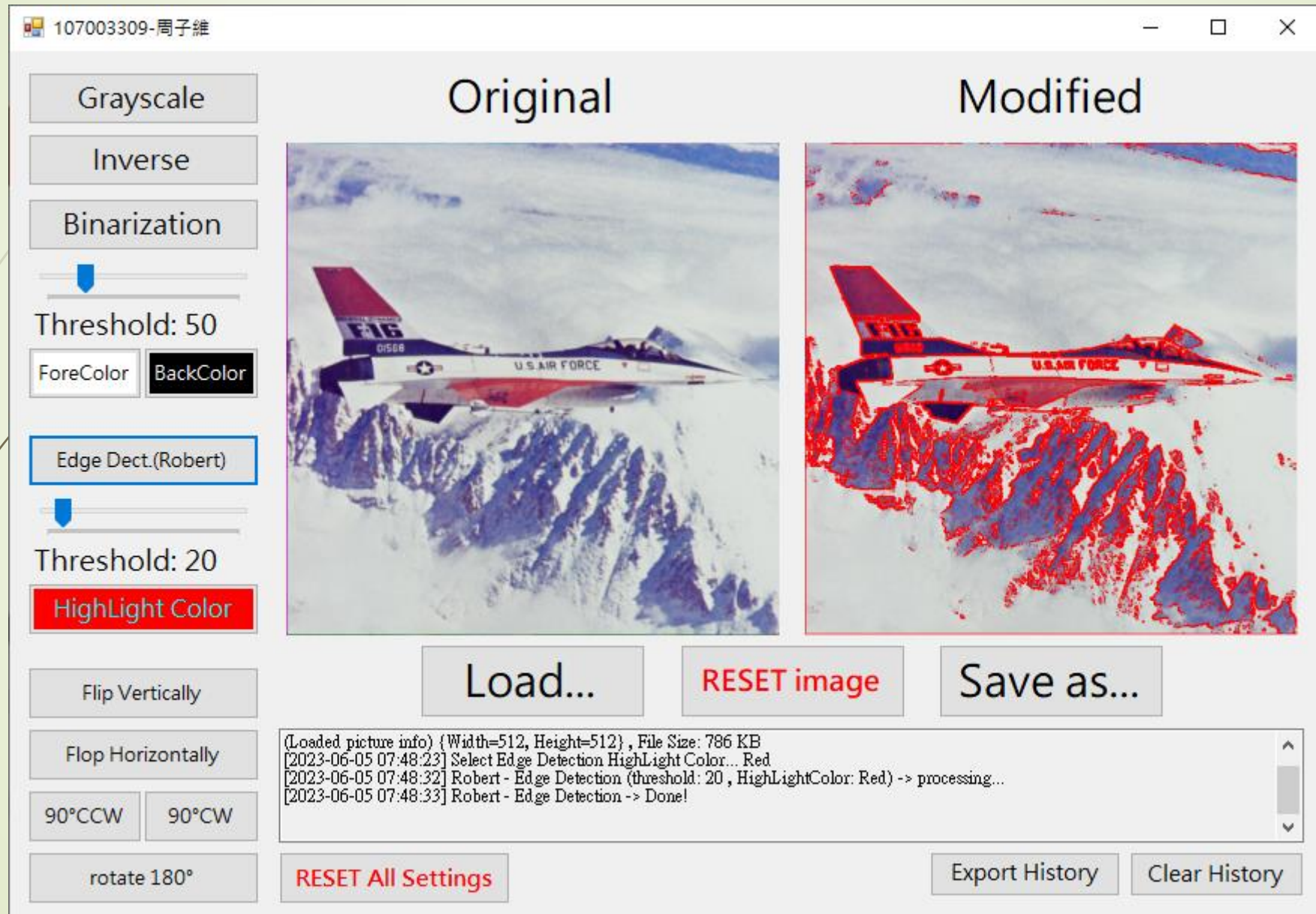
Binarization(影像二值化)-自訂色彩



Robert(影像邊緣偵測)-預設色彩



Robert(影像邊緣偵測)-自訂色彩



Flip Vertically(上下翻轉)

107003309-周子維

Grayscale

Inverse

Binarization

Threshold: 50

ForeColor BackColor

Edge Dect.(Robert)

Threshold: 30

HighLight Color

Flip Vertically

Flop Horizontally

90°CCW 90°CW

rotate 180°

Original

Modified

Load... RESET image Save as...

[2023-06-05 05:48:44] Picture LOADED: E:\CMU1112\週1-AB_影像處理\測試影像 512_512-20230326\airplane512_Color.bmp
(Loaded picture info) {Width=512, Height=512}, File Size: 786 KB
[2023-06-05 05:48:53] Flip Vertically -> processing...
[2023-06-05 05:48:53] Flip Vertically -> Done!

RESET All Settings

Export History Clear History

Flop Horizontally(左右翻轉)

107003309-周子維

Grayscale

Inverse

Binarization

Threshold: 50

ForeColor BackColor

Edge Dect.(Robert)

Threshold: 30

HighLight Color

Flip Vertically

Flop Horizontally

90°CCW 90°CW

rotate 180°

Original

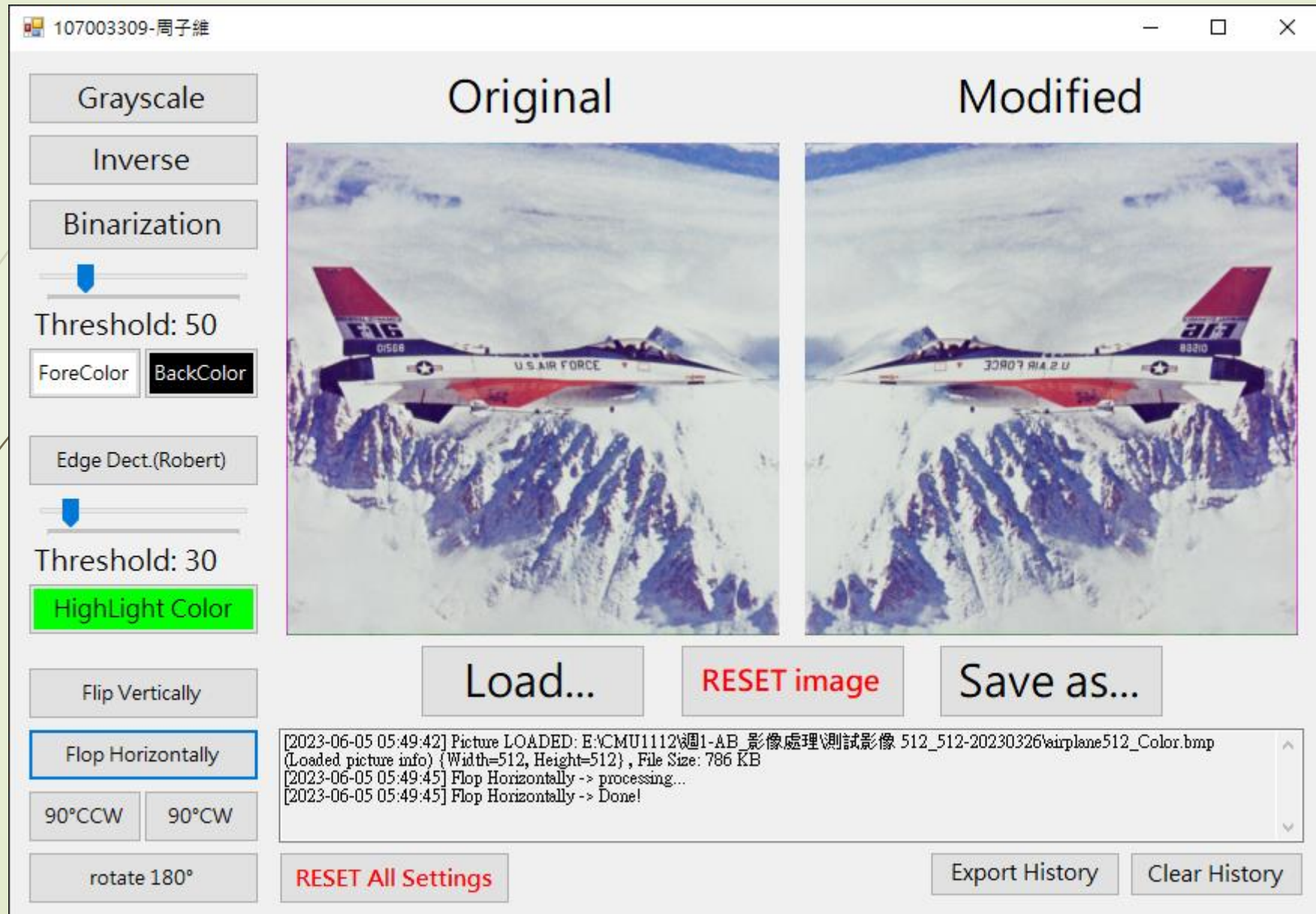
Modified

Load... RESET image Save as...

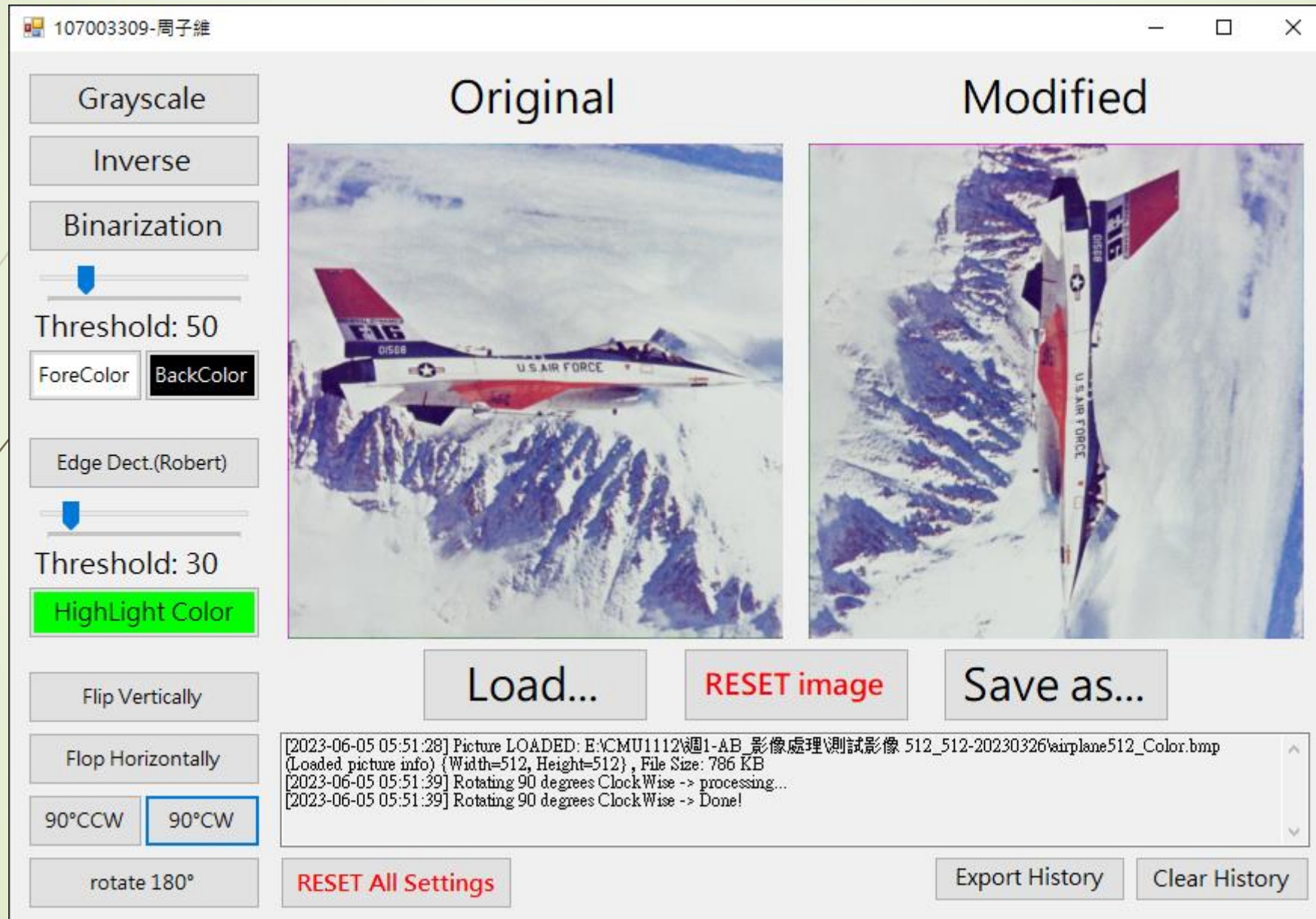
[2023-06-05 05:49:42] Picture LOADED: E:\CMU1112\週1-AB_影像處理\測試影像 512_512-20230326\airplane512_Color.bmp
(Loaded picture info) {Width=512, Height=512}, File Size: 786 KB
[2023-06-05 05:49:45] Flop Horizontally -> processing...
[2023-06-05 05:49:45] Flop Horizontally -> Done!

RESET All Settings

Export History Clear History



90 deg Clockwise rotation(順時針旋轉90度)



90 deg Counter-Clockwise rotation(逆時針旋轉)

107003309-周子維

Grayscale

Inverse

Binarization

Threshold: 50

ForeColor BackColor

Edge Dect.(Robert)

Threshold: 30

HighLight Color

Flip Vertically

Flop Horizontally

90°CCW 90°CW

rotate 180°

Original

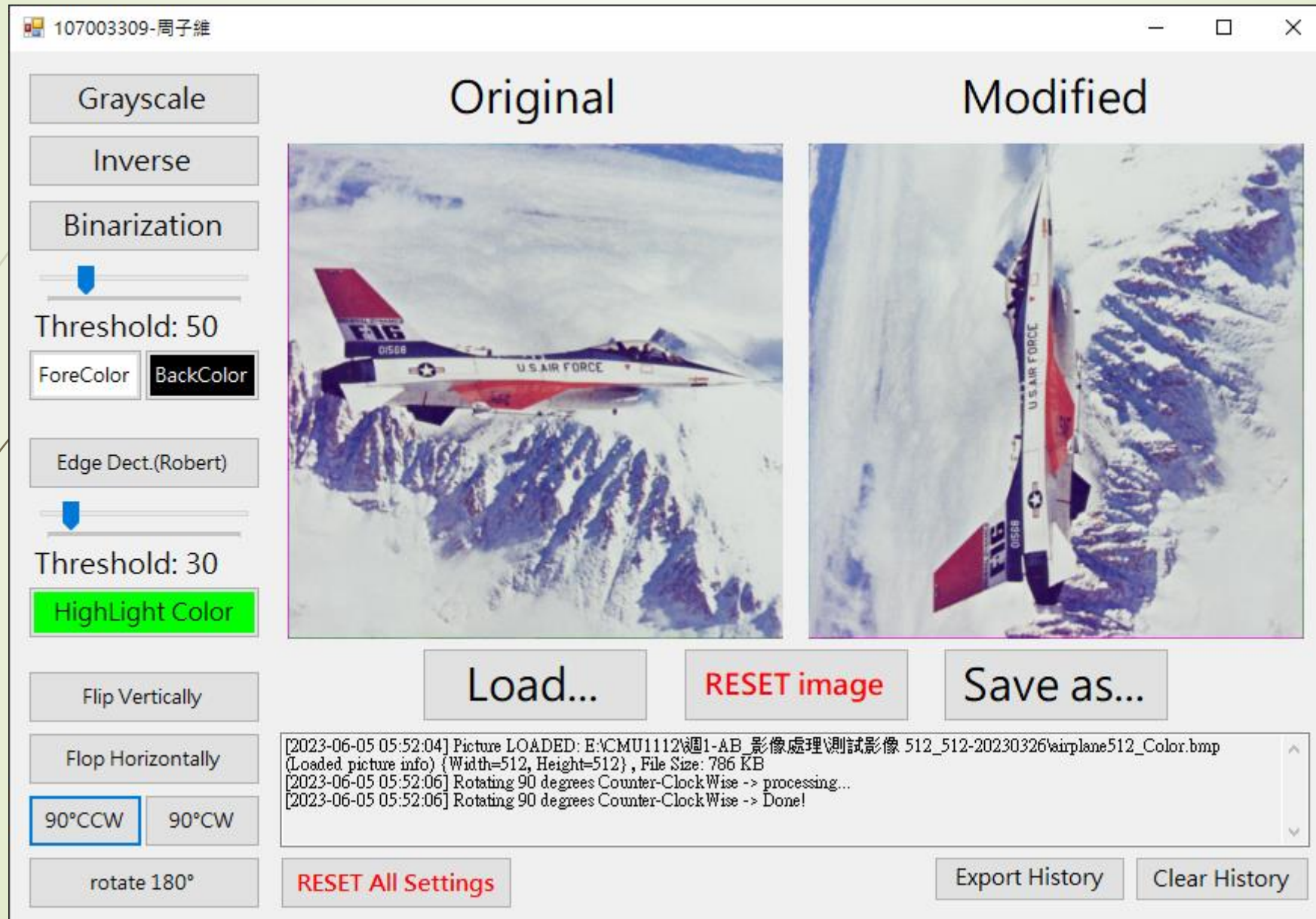
Modified

Load... RESET image Save as...

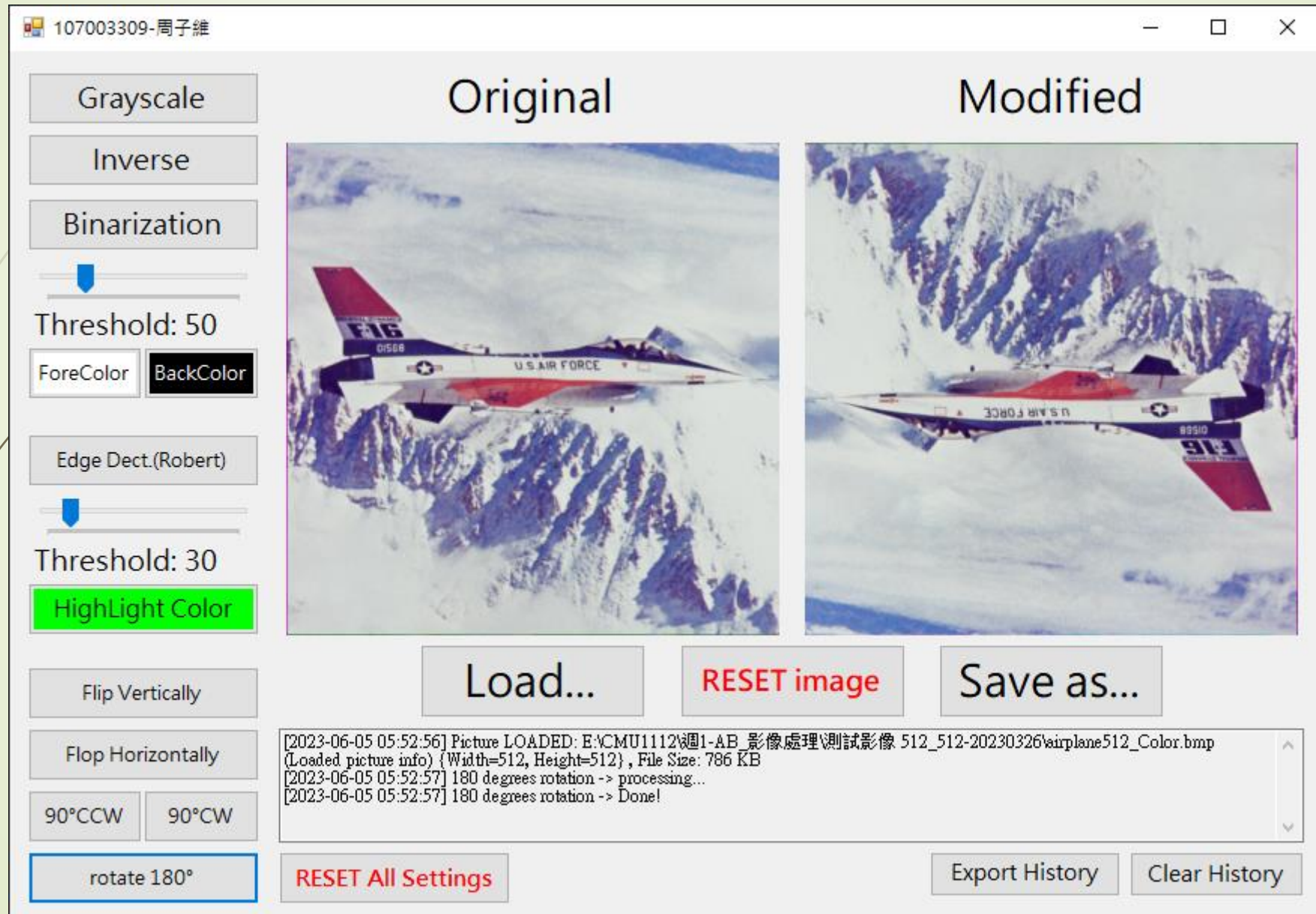
[2023-06-05 05:52:04] Picture LOADED: E:\CMU1112\週1-AB_影像處理\測試影像 512_512-20230326\airplane512_Color.bmp
(Loaded picture info) {Width=512, Height=512}, File Size: 786 KB
[2023-06-05 05:52:06] Rotating 90 degrees Counter-ClockWise -> processing...
[2023-06-05 05:52:06] Rotating 90 degrees Counter-ClockWise -> Done!

RESET All Settings

Export History Clear History

The image shows a screenshot of a Windows application window titled "107003309-周子維". The application is an image processing tool. On the left, there is a vertical toolbar with buttons for "Grayscale", "Inverse", "Binarization", "Edge Dect.(Robert)", "Flip Vertically", "Flop Horizontally", "90°CCW", "90°CW", and "rotate 180°". Below the "Binarization" button is a slider and the text "Threshold: 50". Below the "Edge Dect.(Robert)" button is another slider and the text "Threshold: 30". There are also color selection buttons for "ForeColor" and "BackColor", and a "HighLight Color" button. The main area of the window is divided into two panels: "Original" and "Modified". The "Original" panel shows a photograph of a red, white, and blue F-16 fighter jet flying over a snowy mountain range. The "Modified" panel shows the same image, but rotated 90 degrees counter-clockwise, so the jet is now oriented vertically. Below the image panels are three buttons: "Load...", "RESET image", and "Save as...". At the bottom of the window, there is a text box containing a log of operations: "[2023-06-05 05:52:04] Picture LOADED: E:\CMU1112\週1-AB_影像處理\測試影像 512_512-20230326\airplane512_Color.bmp (Loaded picture info) {Width=512, Height=512}, File Size: 786 KB", "[2023-06-05 05:52:06] Rotating 90 degrees Counter-ClockWise -> processing...", and "[2023-06-05 05:52:06] Rotating 90 degrees Counter-ClockWise -> Done!". To the left of the text box is a "RESET All Settings" button, and to the right are "Export History" and "Clear History" buttons.

Rotate 180 deg(旋轉180度)



Thank you for your time ~

107003309 藥五甲 周子維

Wiwj Jhou

<https://github.com/imwiwi99>

