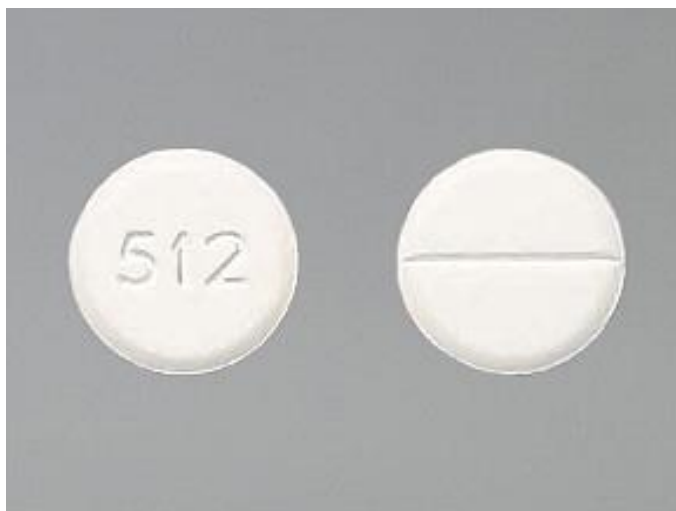
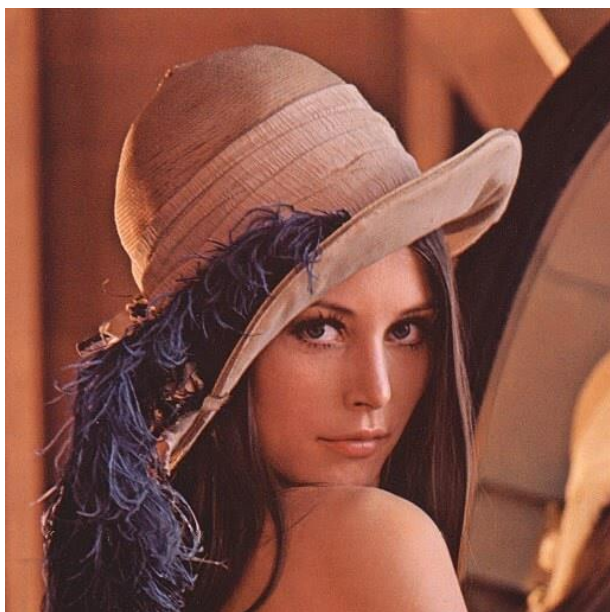


Floodfill、watershields、hough

1. Floodfill:利用特定的輸入顏色來填充圖案的連通區域，通過設定可選取連通上下限，以及聯通方式達成不同效果，也就是說可以對特定區域的相似顏色以某個顏色來代替。
2. Watershields:主要用於圖像分割，再轉 Watersheld 需透過一個 Maker 圖層，步驟為:先將圖像做灰階，將 8-bit 灰階做二值圖，在透過 findContours 函數來取得 Maker 圖層，最後在進行 Watershields。
3. Hough:主要是從圖像中取得所需的特徵，是影像辨識的關鍵。可以抓取直線、曲線、圓形、陀圓形，步驟為先將原圖進行邊緣檢測和灰階圖，在做 hough 運算，其中有許多方式。

實作



```
imshow("ORIGINAL", image);  
  
//模板  
Mat element = getStructuringElement(MORPH_RECT, Size(5,5));  
Mat out;  
/  
dilate(image, out, element);  
imshow("膨脹", out);  
  
erode(image, out, element);  
imshow("腐蝕", out);  
/  
morphologyEx(image, out, MORPH_OPEN, element);  
imshow("open", out);  
  
morphologyEx(image, out, MORPH_CLOSE, element);  
imshow("close", out);
```



一串文字(B:模板 2 * 2)

原圖	膨脹
<pre>imshow("ORIGINAL", image); //模板 Mat element = getStructuringElement(MORPH_RECT, Size(5,5)); Mat out; / dilate(image, out, element); imshow("膨脹", out); erode(image, out, element); imshow("腐蝕", out); morphologyEx(image, out, MORPH_OPEN, element); imshow("open", out); morphologyEx(image, out, MORPH_CLOSE, element); imshow("close", out);</pre>	<pre>imshow("ORIGINAL", image); //模板 Mat element = getStructuringElement(MORPH_RECT, Size(5,5)); Mat out; / dilate(image, out, element); imshow("膨脹", out); erode(image, out, element); imshow("腐蝕", out); morphologyEx(image, out, MORPH_OPEN, element); imshow("open", out); morphologyEx(image, out, MORPH_CLOSE, element); imshow("close", out);</pre>

侵蝕	Open
<pre>imshow("ORIGINAL", image); //模板 Mat element = getStructuringElement(MORPH_RECT, Size(5,5)); Mat out; / dilate(image, out, element); imshow("膨脹", out); erode(image, out, element); imshow("腐蝕", out); morphologyEx(image, out, MORPH_OPEN, element); imshow("open", out); morphologyEx(image, out, MORPH_CLOSE, element); imshow("close", out);</pre>	<pre>imshow("ORIGINAL", image); //模板 Mat element = getStructuringElement(MORPH_RECT, Size(5,5)); Mat out; / dilate(image, out, element); imshow("膨脹", out); erode(image, out, element); imshow("腐蝕", out); morphologyEx(image, out, MORPH_OPEN, element); imshow("open", out); morphologyEx(image, out, MORPH_CLOSE, element); imshow("close", out);</pre>

```
imshow("ORIGINAL", image);
```

Close

```
//模板
```

```
Mat element = getStructuringElement(MORPH_RECT, Size(5,5));
```

```
Mat out;
```

```
/
```

```
dilate(image, out, element);
```

```
imshow("膨胀", out);
```

```
erode(image, out, element);
```

```
imshow("腐蚀", out);
```

```
morphologyEx(image, out, MORPH_OPEN, element);
```

```
imshow("open", out);
```

```
morphologyEx(image, out, MORPH_CLOSE, element);
```

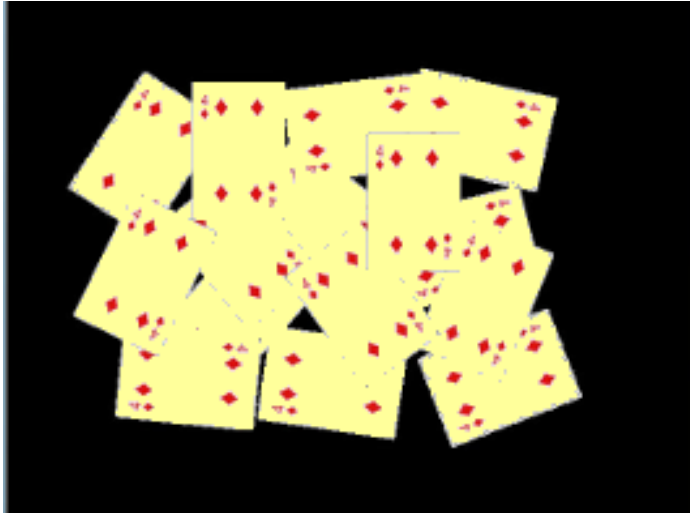
```
imshow("close", out);
```

gray histogram

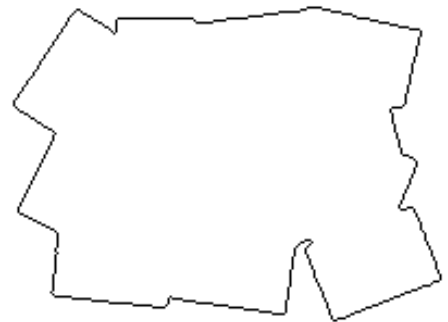
color histogram

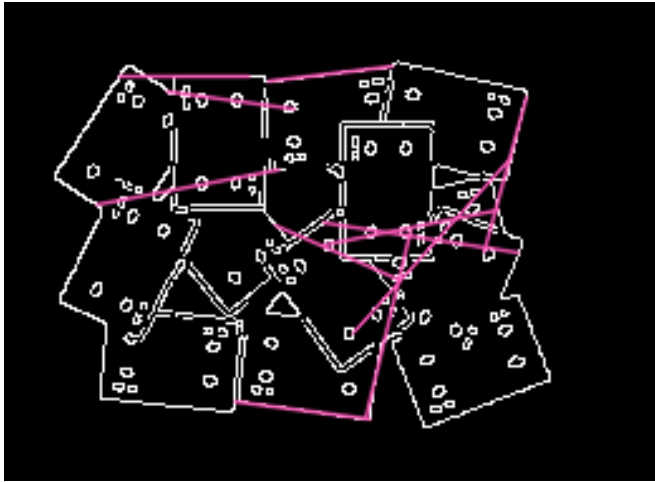
撲克牌

Floodfill:以黃色來代替白色



Watersheds:透過分水嶺方式
來分割圖片。



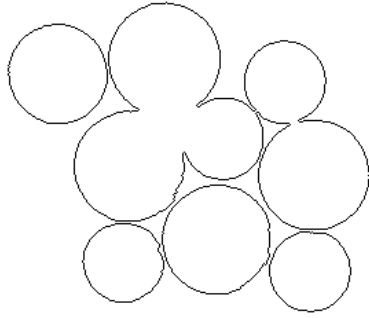


Hough:尋找直線的特徵

錢幣



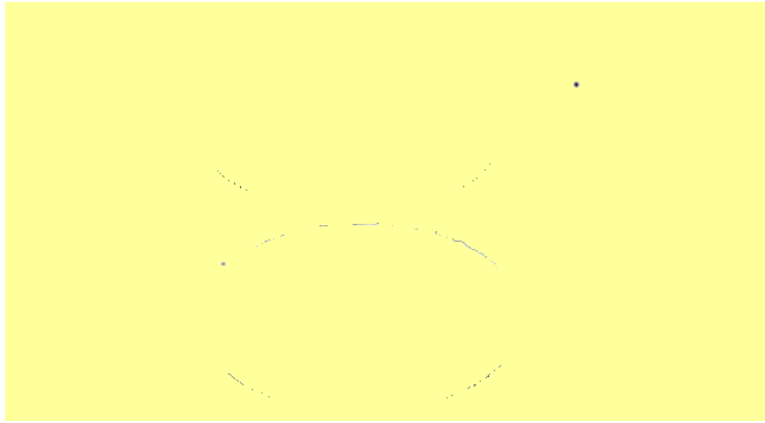
Floodfill:將原本黑色
背景轉成黃色的背景



watersheds:將每個
硬幣都分割成一個一
個的

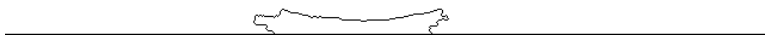


Hough:搜尋圓形的特徵



因為此照片都接近
白色，所以在
Floodfill 下就都為上
色的顏色

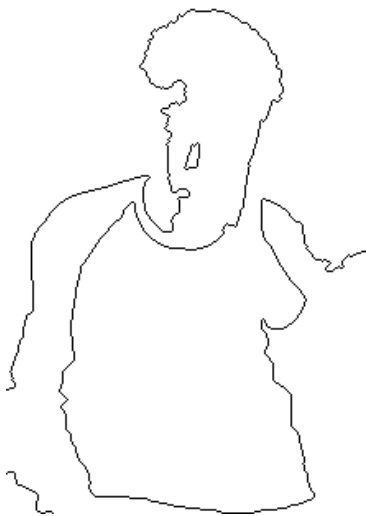
watersheds



Hough



透過 Floodfill 將特定艷色的背景轉為黃色。



watersheds



Hough