F74056247 曾大瑋

# Project2-Edge Detection

## 原始程式碼

```
import cv2
import numpy as np
from matplotlib import pyplot as plt

antOrigin = cv2.imread('ant.png',0)
planeOrigin=cv2.imread('plane.png',0)

#Utility function to show image in grayscale
def showImage(image,text):
   plt.subplot(111)
   plt.imshow(image,cmap='gray')
   plt.title(text)
   plt.xticks([]), plt.yticks([])
   plt.show()

#Show origin image
def showOrigin(image):
   showImage(image,'Original Image(grayscale)')

#Show Gaussian Blurred image
def showGaussian(image):
   image=cv2.GaussianBlur(image,(5,5),0) #(5,5) means 5*5 pixel into 1 pixel blurred
   showImage(image,'Gaussian Blurred Image(grayscale)')

#Show Equalized Histogram image
def showEqualizeHist(image):
   image=cv2.GaussianBlur(image,(5,5),0)
   image=cv2.equalizeHist(image)
   showImage(image,'Equalized Histogram Image(grayscale)')

#Show Sobel operator filtered image
def showSobel(image):
   image=cv2.GaussianBlur(image,(5,5),0)
   # get sobel image in X and Y derivation
   sobelX=cv2.Sobel(image,-1,1,0,ksize=3) #2-nd derivation sobel operator
   sobelY=cv2.Sobel(image,-1,0,1,ksize=3)
   #get abs of image
   sobelX = cv2.convertScaleAbs(sobelX)
   sobelY = cv2.convertScaleAbs(sobelY)
   #combine image together
   image = cv2.addWeighted(sobelX, 1, sobelY, 1, 0)
   showImage(image,'Edge Image')
```

showOrigin(antOrigin)
showGaussian(antOrigin)
showEqualizeHist(antOrigin)
showSobel(antOrigin)

showOrigin(planeOrigin)
showGaussian(planeOrigin)
showEqualizeHist(planeOrigin)
showSobel(planeOrigin)

# 程式碼解說

有 5 個 function
其中 showImage(image,text):為顯示圖片 function

剩下的為處理圖片
showGaussian(image): 將圖片做高斯模糊
showEqualizeHist(image): 將圖片做 Euqalized histogram
showSobel(image): 將圖片做 Sobel operator filter
showOrigin(image): 顯示原始圖片

輸出結果

如範例圖