

## 第15節

## Real-World Applications

1

影像處理

活用案例

2

認識

Privacy  
Protection

3

實作

Privacy  
Protection

## 同學，歡迎你參加本課程

- ✓ 請關閉你的FB、Line等溝通工具，以免影響你上課。
- ✓ 考量頻寬，請預設關閉麥克風、攝影機，若有需要再打開。
- ✓ 隨時準備好，老師會呼叫你的名字進行互動。
- ✓ 如果有緊急事情，你必需離開線上教室，請用聊天室私訊給老師，以免老師癡癡呼喚你的名字。
- ✓ 先倒好水、上個洗手間，準備上課囉^^



# 課程檔案下載

巨匠電腦線上真人

開課查詢

免費體驗專區

課程總覽

專業師資

學員專區

講師專區

最新消息



您好!

登出

## 程式語言好難學?

那是因為

## 你還沒學過Python!

(線上老師 **LIVE** 直播教學 · 搶先看)

巨匠電腦真人課程

點數卡產品兌換

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我的課表

IT真人課程劃位

電腦分校課程劃位

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取消劃位

課程檔案下載

上課權益查詢

教學平台測試

學習諮詢

常見問題

個資維護

忘記密碼

登出

課程檔案下載

# ZOOM 學員操作說明

The screenshot shows the Zoom interface with several key areas highlighted for student use:

- 5 查看選項/共同註記/筆 (連連看)**: A dropdown menu is open from the '查看選項' (View Options) button in the top right. The '共同註記' (Annotate) option is highlighted, which opens the drawing toolbar below it. The toolbar includes icons for '滑鼠' (Mouse), '文字' (Text), '筆' (Pen), '箭頭' (Arrow), '擦除' (Erase), '格式' (Format), '撤銷' (Undo), '重做' (Redo), and '清除' (Clear).
- 2 共享螢幕 (指導演練; 點評作品)**: The '共享螢幕' (Share Screen) button in the bottom toolbar is highlighted. A text box explains: '老師須先停止共享螢幕 才能請學生共享螢幕' (The teacher must first stop sharing the screen before asking the student to share the screen).
- 1 聊天**: The '聊天' (Chat) button in the bottom toolbar is highlighted.
- 3 與會者/舉手**: The '與會者' (Participants) button in the bottom toolbar is highlighted. A callout box shows the '與會者 (15)' (Participants (15)) window. In this window, the '舉手' (Raise Hand) button is highlighted.
- 4 解除靜音**: The '解除靜音' (Unmute) button in the bottom toolbar is highlighted.

Other visible elements include the Zoom logo, the URL 'www.pcschool.com.tw', and a status bar at the top indicating '您正在觀看蘇世榮的螢幕' (You are viewing Su Shihong's screen).



# Applications

- Turning to grayscale before detecting edges/corners
- Reducing noise and restoring images
- Blurring faces detected
- Approximation of objects' sizes

Edges with Canny



Blurred faces



# Privacy protection



# Privacy protection

```
# Import Cascade of classifiers and gaussian filter
from skimage.feature import Cascade
from skimage.filters import gaussian
```

# Privacy protection

```
# Detect the faces
detected = detector.detect_multi_scale(img=image,
                                       scale_factor=1.2, step_ratio=1,
                                       min_size=(50, 50), max_size=(100, 100))

# For each detected face
for d in detected:
    # Obtain the face cropped from detected coordinates
    face = getFace(d)
```



# Privacy protection

```
def getFace(d):  
    ''' Extracts the face rectangle from the image using the  
    coordinates of the detected.'''  
    # X and Y starting points of the face rectangle  
    x, y = d['r'], d['c']  
  
    # The width and height of the face rectangle  
    width, height = d['r'] + d['width'], d['c'] + d['height']  
  
    # Extract the detected face  
    face= image[x:width, y:height]  
    return face
```

# Privacy protection

```
# Detect the faces
detected = detector.detect_multi_scale(img=image,
                                       scale_factor=1.2, step_ratio=1,
                                       min_size=(50, 50), max_size=(100, 100))

# For each detected face
for d in detected:
    # Obtain the face cropped from detected coordinates
    face = getFace(d)

    # Apply gaussian filter to extracted face
    gaussian_face = gaussian(face, multichannel=True, sigma = 10)

    # Merge this blurry face to our final image and show it
    resulting_image = mergeBlurryFace(image, gaussian_face)
```

# Privacy protection

```
def mergeBlurryFace(original, gaussian_image):  
    # X and Y starting points of the face rectangle  
    x, y = d['r'], d['c']  
    # The width and height of the face rectangle  
    width, height = d['r'] + d['width'], d['c'] + d['height']  
  
    original[ x:width, y:height] = gaussian_image  
    return original
```

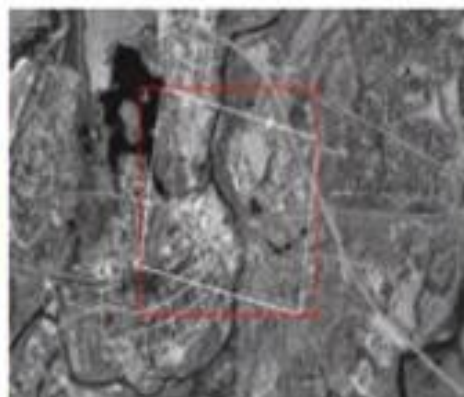
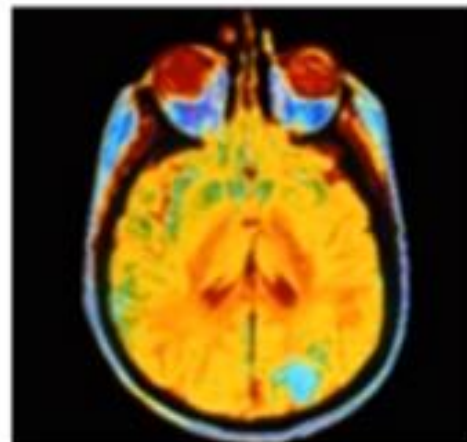


# Privacy protection

Blurred faces



# More cases



# Recap: What you have learned

- Improved contrast
- Restored images
- Applied filters
- Rotated, flipped and resized!
- Segmented: supervised and unsupervised
- Applied morphological operators
- Created and reduced noise
- Detected edges, corners and faces
- And mixed them up to solve problems!



# What's next?

- Tinting gray scale images
- Matching
- Approximation
- Many others!





# Congrats!

IMAGE PROCESSING IN PYTHON












# 練習時間

## 15.Real-World Applications.ipynb



 jupyter 15.Real-World Applications Last Checkpoint: an hour ago (autosaved)  Logout

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

          Code 

### 練習


#### Privacy protection

Let's look at a real-world application of what you have learned in the course.

In this exercise, you will detect faces in the image and for the sake of privacy, you will anonymize data by blurring people's faces in the image automatically.

Group band walking Image preloaded as group\_image. You can use the gaussian filter for the blurriness.

The face detector is ready to use as detector and all packages needed have been imported.


















# 練習時間

## 15.Real-World Applications.ipynb



 jupyter 15.Real-World Applications Last Checkpoint: an hour ago (autosaved)  Logout

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

       Run    Code 

### 練習


#### Help Sally restore her graduation photo

You are going to combine all the knowledge you acquired throughout the course to complete a final challenge: reconstructing a very damaged photo.

Help Sally restore her favorite portrait which was damaged by noise, distortion, and missing information due to a breach in her laptop.

Sally damaged picture Sally's damaged portrait is already loaded as `damaged_image`. You will be fixing the problems of this image by:

Rotating it to be upright using `rotate()` Applying noise reduction with `denoise_tv_chambolle()` Reconstructing the damaged parts with `inpaint_biharmonic()` from the `inpaint` module. `show_image()` is already preloaded.



# STATEMENT OF ACCOMPLISHMENT

#10599223

HAS BEEN AWARDED TO

**Lewis Yang**

FOR SUCCESSFULLY COMPLETING

**Image Processing in Python**

COMPLETED ON  
**Sep 06, 2019**



**DataCamp**



# 問卷

<http://www.pcschoolonline.com.tw>

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專業師

1

學員專區

講師專區



## 課程檔案下載：

學員的「上課教材」，下載檔案為壓縮檔 ([解壓縮操作步驟](#))。  
如無法觀看上課教材，請安裝 [PDF閱讀軟體](#)。

公告專區

我的課表

課程劃位

取消劃位

2

課程檔案下載

自107年1月1日起，課程錄影檔由180天改為365天(含)內無限次觀看 (上課隔日18:00起)。

問卷

上課日期	課程名稱	課程節次	教材下載		
2017/12/27 2000 ~ 2200	線上真人-ZBrush 3D動畫造型設計	18	<a href="#">上課教材</a>	<a href="#">錄影</a>	<a href="#">課堂問卷</a>
2017/12/20 2000 ~ 2200	線上真人-ZBrush 3D動畫造型設計	17	<a href="#">上課教材</a>	<a href="#">錄影檔</a>	
2017/12/18 2000 ~ 2200	線上真人-ZBrush 3D動畫造型設計	16	<a href="#">上課教材</a>	<a href="#">錄影檔</a>	





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