python™

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
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課程總覽
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學員專區
講師專區
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APCS檢測專區
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外語真人課程劃位
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課程檔案下載
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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
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

ZOOM 學員操作說明

5 查看選項/共同註記/筆（連連看）

2 共享螢幕（指導演練；點評作品）
老師須先停止共享螢幕
才能請學生共享螢幕

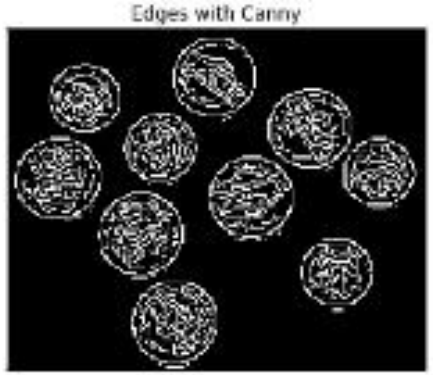
1 聊天

4 解除靜音

3 與會者/舉手

Applications

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



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

Run Code

練習

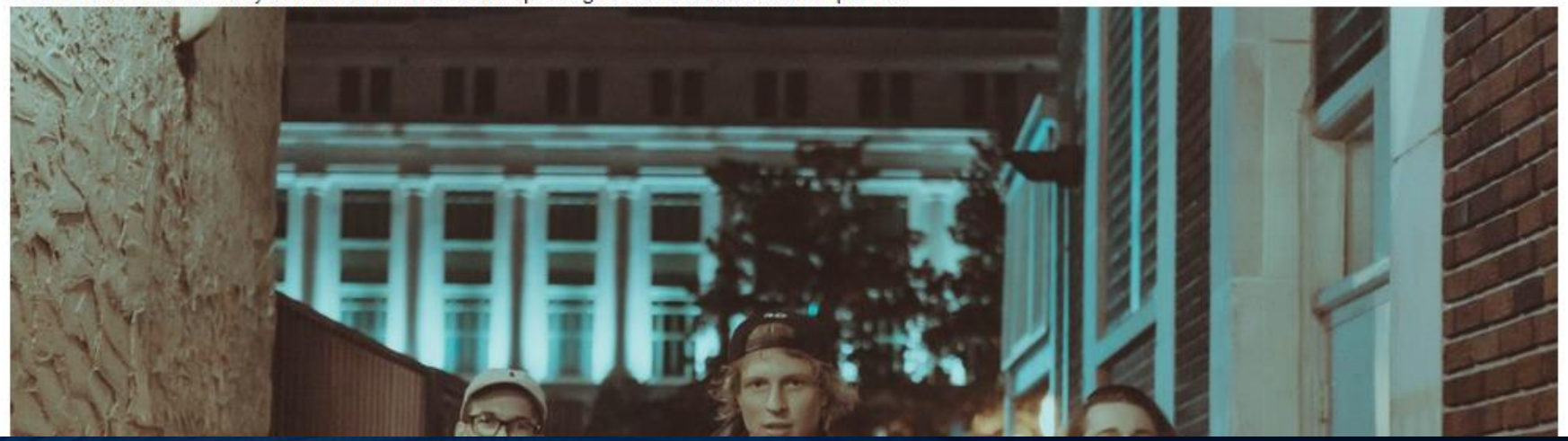
Privacy protection

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.



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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 uprightusing 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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