

第八節

Image restoration

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認識 Image
reconstruction
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熟悉 **Masks**

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^^

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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)

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ZOOM 學員操作說明

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

- Annotation Menu:** A dropdown menu is open, showing options like '原始大小' (Original Size), '請求遠端控制' (Request Remote Control), '共同註記' (Annotate), and '退出全螢幕' (Exit Full Screen). The '共同註記' (Annotate) option is highlighted with an orange box and labeled with a circled '5'.
- Toolbar:** Below the menu, the toolbar shows icons for '滑鼠' (Mouse), '文字' (Text), '筆' (Pen), '橡皮' (Eraser), '格式' (Format), '撤銷' (Undo), '重做' (Redo), and '清除' (Clear). The '筆' (Pen) icon is highlighted with an orange box and labeled with a circled '5'.
- Participants Window:** A window titled '與會者 (15)' (Participants (15)) is open, showing a list of participants. The '舉手' (Raise Hand) button is highlighted with an orange box and labeled with a circled '3'.
- Bottom Bar:** The bottom bar contains icons for '解除靜音' (Unmute), '啟動視訊' (Start Video), '邀請' (Invite), '與會者' (Participants), '共享螢幕' (Share Screen), '聊天' (Chat), and '錄影' (Record). The '解除靜音' (Unmute) icon is highlighted with an orange box and labeled with a circled '4'. The '與會者' (Participants) icon is highlighted with an orange box and labeled with a circled '3'.
- Chat Window:** A chat window is open, showing a list of messages. The '聊天' (Chat) icon in the bottom bar is highlighted with an orange box and labeled with a circled '1'.
- Share Screen Window:** A window titled '共享螢幕' (Share Screen) is open, showing a list of participants. The '共享螢幕' (Share Screen) icon in the bottom bar is highlighted with an orange box and labeled with a circled '2'.

Annotations and their corresponding actions:

- 1 聊天** (Chat): The chat window is open, showing a list of messages.
- 2 共享螢幕** (Share Screen): The share screen window is open, showing a list of participants. The text indicates: 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).
- 3 與會者/舉手** (Participants/Raise Hand): The participants window is open, showing a list of participants. The '舉手' (Raise Hand) button is highlighted.
- 4 解除靜音** (Unmute): The '解除靜音' (Unmute) icon in the bottom bar is highlighted.
- 5 查看選項/共同註記/筆** (View Options/Annotate/Pen): The '共同註記' (Annotate) option in the dropdown menu and the '筆' (Pen) icon in the toolbar are highlighted.

Restore an image

Image to restore



Image restored



Image reconstruction

- Fixing damaged images
- Text removing
- Logo removing
- Object removing



Image reconstruction

Inpainting

- Reconstructing lost parts of images
- Looking at the non-damaged regions



Inpainting

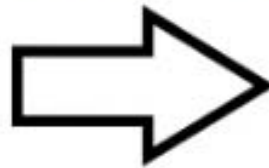


Image reconstruction

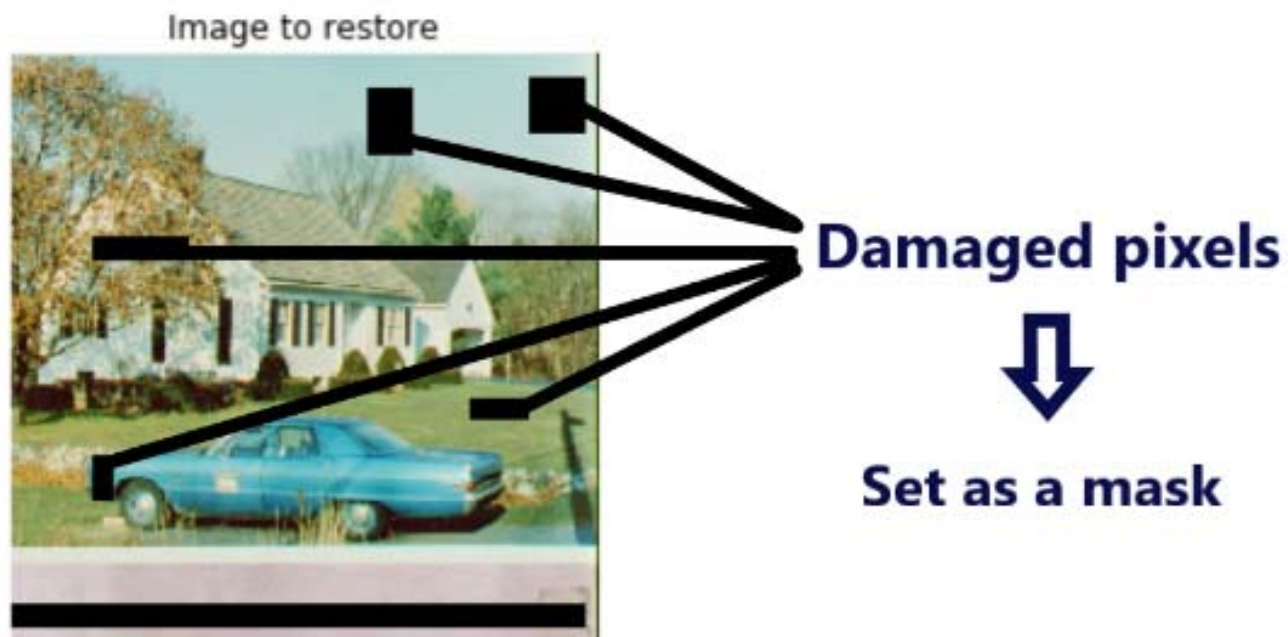


Image reconstruction in scikit-image

```
from skimage.restoration import inpaint

# Obtain the mask
mask = get_mask(defect_image)

# Apply inpainting to the damaged image using the mask
restored_image = inpaint.inpaint_biharmonic(defect_image,
                                             mask,
                                             multichannel=True)

# Show the resulting image
show_image(restored_image)
```

Image reconstruction in scikit-image

```
# Show the defect and resulting images  
show_image(defect_image, 'Image to restore')  
show_image(restored_image, 'Image restored')
```

Image to restore



Image restored



Masks

Image to restore



Mask



Masks

```
def get_mask(image):  
    ''' Creates mask with three defect regions '''  
    mask = np.zeros(image.shape[:-1])  
  
    mask[101:106, 0:240] = 1  
  
    mask[152:154, 0:60] = 1  
    mask[153:155, 60:100] = 1  
    mask[154:156, 100:120] = 1  
    mask[155:156, 120:140] = 1  
  
    mask[212:217, 0:150] = 1  
    mask[217:222, 150:256] = 1  
    return mask
```

練習時間

Image Restoration.ipynb




jupyter 8.Image Restoration Last Checkpoint: 14 hours ago (autosaved) Logout


File Edit View Insert Cell Kernel Widgets Help Trusted | Python 3

Run Run Markdown

original



Astronaut



The image shows a Jupyter Notebook interface for a file named '8.Image Restoration'. The notebook has a menu bar with 'File', 'Edit', 'View', 'Insert', 'Cell', 'Kernel', 'Widgets', and 'Help'. Below the menu is a toolbar with icons for saving, adding, deleting, and running cells, along with a 'Run' button and a 'Markdown' dropdown. The notebook content displays two side-by-side images of astronaut S. Christa McAuliffe. The left image, labeled 'original', has three black rectangular redaction boxes: one on the right side of her head, one on the left side of her chest, and one on the right side of her chest. The right image, labeled 'Astronaut', is the same photo but without the redactions, showing the full astronaut in her orange flight suit and helmet, standing in front of an American flag and a model of a space shuttle.

練習時間

Image Restoration.ipynb



jupyter 8.Image Restoration Last Checkpoint: 15 hours ago (autosaved) Logout

File Edit View Insert Cell Kernel Widgets Help Not Trusted | Python 3

Save + Undo Copy Paste Up Down Run Stop Restart Markdown

練習

Removing logos As we saw in the video, another use of image restoration is removing objects from an scene. In this exercise, we'll remove the Datacamp logo from an image.

Landscape with small datacamp logo Image loaded as `image_with_logo`. You will create and set the mask to be able to erase the logo by inpainting this area.

Remember that when you want to remove an object from an image you can either manually delineate that object or run some image analysis algorithm to find it.



問卷

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

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> 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](#)。

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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 | 上課教材 | 錄影 3 | 課堂問卷 |
| 2017/12/20 2000 ~ 2200 | 線上真人-ZBrush 3D動畫造型設計 | 17 | 上課教材 | 錄影檔 | |
| 2017/12/18 2000 ~ 2200 | 線上真人-ZBrush 3D動畫造型設計 | 16 | 上課教材 | 錄影檔 | |



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