### Lab 11 Restore Text

ให้นักศึกษาใช้Colab/JupyterNotebook ทำตามคำสั่งด่านล่าง (ปรับปรุงให้ตัวหนังสือดีขึ้น) แล้วCapture เป็นไฟล์ภาพหรือPDF Uploadส่งงานมาในLMS

- 1. ให้นักศึกษาโหลดภาพ ตัวหนังสือที่พังๆ จากurl: https://assets.gezdev.com/dip/BrokenText.png
  - 1.1. รหัสต้นฉบับ

- 2. แปลงภาพเป็น Gray Scale ถัดจากนั้นทำให้ภาพเป็น Binary และ plot ภาพออกมา
  - 2.1. รหัสต้นฉบับ

```
src = cv.imread("./BrokenText.png")
gray_img = cv.cvtColor(src,cv.COLOR_BGR2GRAY)
_,bin_img = cv.threshold(gray_img,127,255,cv.THRESH_BINARY)
plt.rcParams["figure.figsize"] = [30, 18]
#plt.rcParams["figure.autolayout"] = True
plt.imshow(bin_img,cmap='gray'),plt.xticks([]),plt.yticks([])
plt.show()
```

### 2.2. ผลลัพธ์

Optical character recognition or optical character readier (OCR) is the mechanical or electronic conversion of images of typed, handwritten or printed text into machine-encoded text, whether from a scanned document, a photo of a document, a scene-photo (for example the text on signs and billihoards in a landscape photo) or from subtitle text superimposed on an image (for example from a television broadcast).

Widely used as a form of information entry from printed paper data records – whether passport documents, invoices, bank statements, computerized receipts, business cards, mail, printouts of static data, or any suitable documentation – it is a common method of digitizing printed texts so that they can be electronically edited, searched, stored more compactly, displayed on-line, and used in machine processes such as cognitive computing, machine translation, (extracted) text-to-speech, key data and text mining. OCR is a field of research in pottern recognition, artificial intelligence and computer vision.

# 3. ใช้การการปรับปรุงภาพวิธีการใด ๆ ก็ได้กู้คืนภาพต่อไปนี้ให้คืนสภาพให้ได้ดีที่สุด ทดลองทำโดยวิธีการ ต่าง ๆ สรุป Algorithm ที่ นศ. ใช้ปรับปรุง

## 3.1. รหัสต้นฉบับ

```
rect5x5 = cv.getStructuringElement(cv.MORPH_RECT,(5,5))
cross5x5 = cv.getStructuringElement(cv.MORPH_CROSS,(5,5))
ellipse5x5 = cv.getStructuringElement(cv.MORPH_ELLIPSE,(5,5))

dilated_rect5x5 = cv.dilate(bin_img,rect5x5,iterations=1)
dilated_cross5x5 = cv.dilate(bin_img,cross5x5,iterations=1)
dilated_ellipse5x5 = cv.dilate(bin_img,ellipse5x5,iterations=1)
ALL_show_img = np.concatenate((dilated_cross5x5,dilated_ellipse5x5,dilated_rect5x5),axis=1)
plt.imshow(ALL_show_img,cmap='gray')
```

#### 3.2. ผลลัพธ์

Optical character recognison or optical character reader (OCR) is the mechanical or efectionic convenion of majors of speak jumpwitten or princed that retor machine-serceded text, whether from a starred dynamical, a prical of a formunes, a some pricing for example the text on signs and billiouses in a tendracipe photol or from subtile text superimposed on an image 200 - (for example from a television broadcast).

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- 3.3. สรุป Algorithm ที่ใช้ปรับปรุง : <u>Algorithm ที่ใช้ทดลองในการทดลองนี้มี 3 แบบ ดังนี้</u>
  - 3.3.1. Dilate(พอก) โดยใช้ Rectangular kernel 5x5
  - 3.3.2. Dilate(พอก) โดยใช้ Cross kernel 5x5
  - 3.3.3. Dilate(พอก) โดยใช้ Elliptical kernel 5x5

จากผลการทดลอง พบว่า Dilate(พอก) โดยใช้ Rectangular kernel 5x5 คืนสภาพได้น้อยที่สุด ส่วน Dilate(พอก) โดยใช้ Cross kernel 5x5 คืนสภาพที่ดีกว่าใช้ Rectangular kernel 5x5 และ Dilate(พอก) โดยใช้ Elliptical kernel 5x5 คืนภาพได้ดีที่สุด

เปรียบเทียบระหว่างภาพต้นฉบับ(ภาพด้านบน) และภาพที่ปรับปรุงโดยใช้ Dilate(พอก) โดยใช้ Elliptical kernel 5x5(ภาพด้านล่าง)

ALL\_show\_img = np.concatenate((bin\_img,dilated\_rect5x5),axis=0)
plt.imshow(ALL\_show\_img,cmap='gray')

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