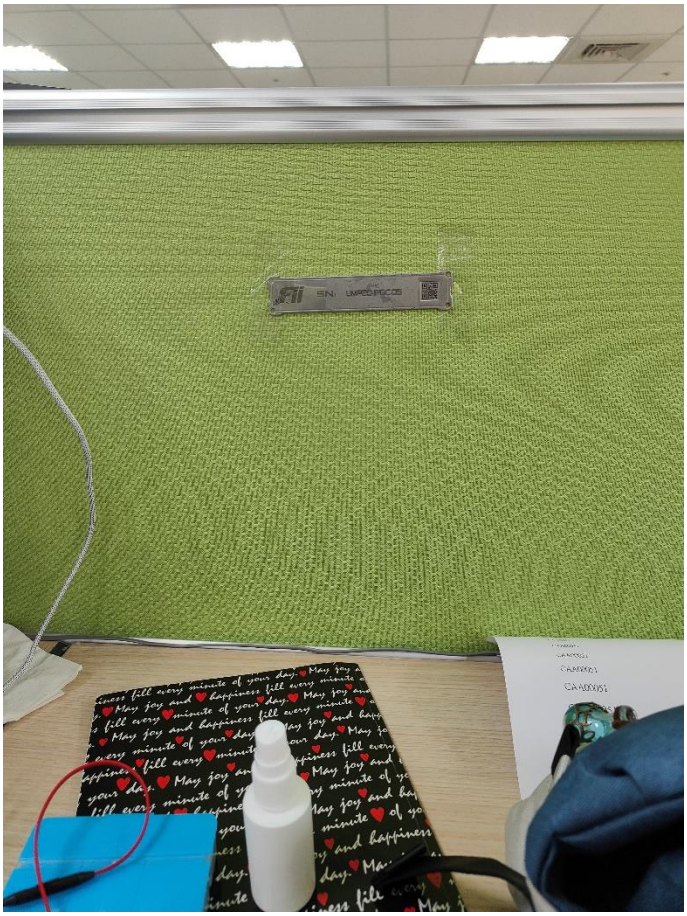
4K 畫質下 QRcode 掃描報告

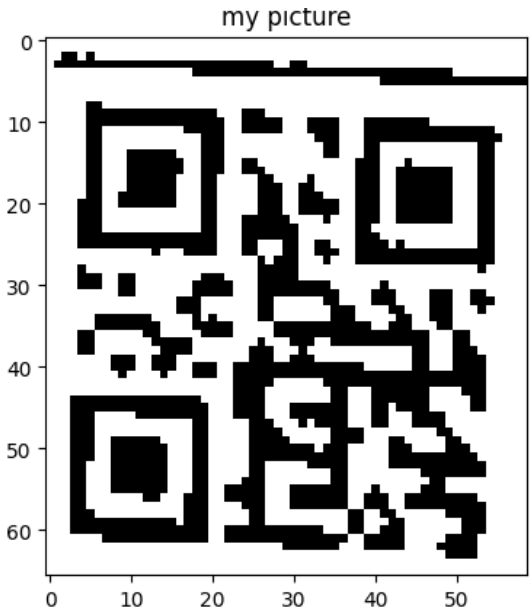
- AIteam KC

- 目標 ： 金屬片之 QRcode 大小 = 1 * 1 (cm)

- 檢測距離 ：60cm、70cm、100cm
- 目的 ： 使 QRcode detecter 能夠檢測到一定距離之小 QRcode

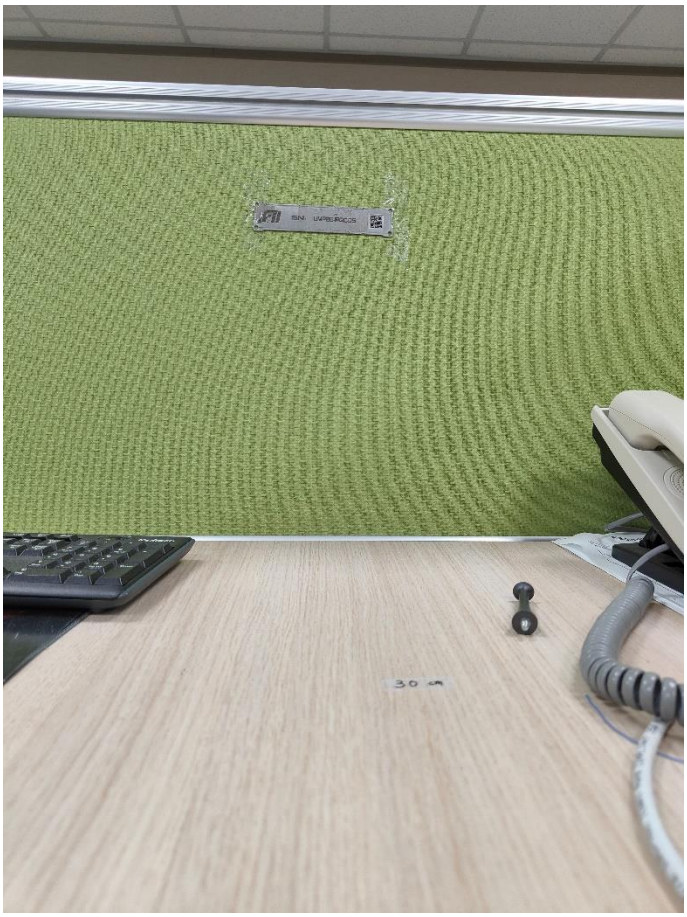
- 50cm



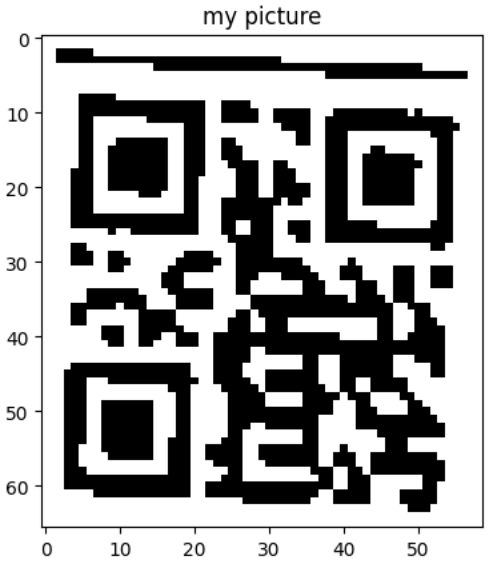



```
[Decoded(data=b'ZH-20210701-00002', type='QRCODE', rect=Rect(left=2, top=8, width=53, height=55), polygon=[Point(x=2, y=61), Po
int(x=53, y=63), Point(x=55, y=11), Point(x=5, y=8)], quality=1, orientation='UP')]
```

- 60cm



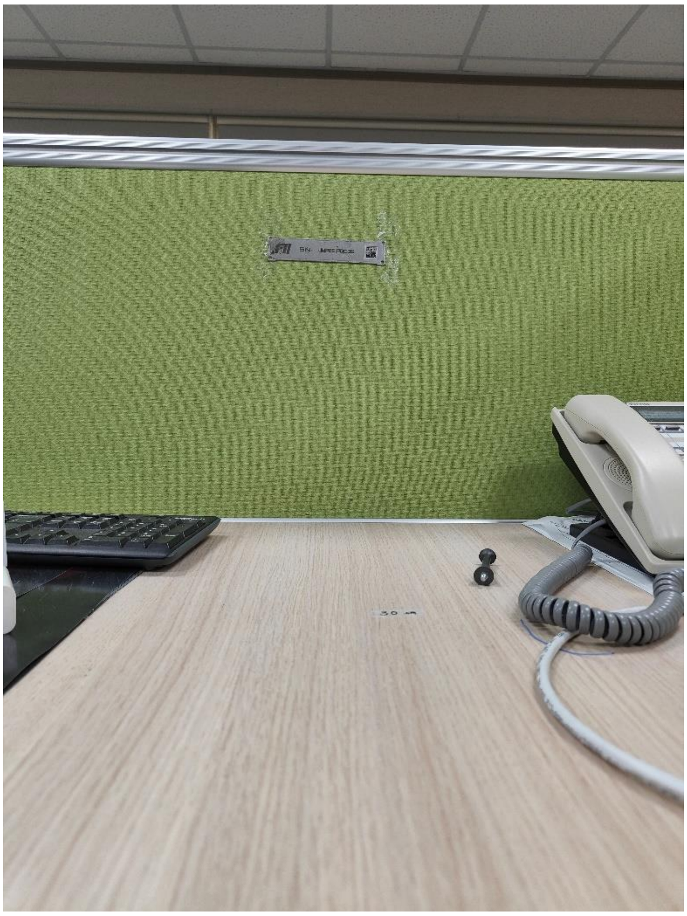

```
<class 'numpy.ndarray'>
```



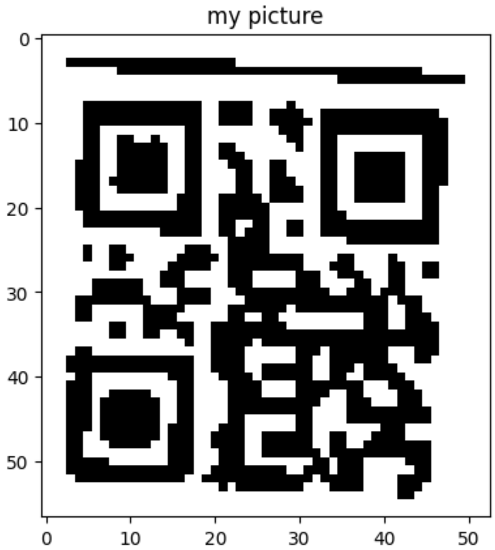
解碼結果:

```
[Decoded(data=b'ZH-20210701-00002', type='QRCODE', rect=Rect(left=2, top=8, width=53, height=55), polygon=[Point(x=2, y=61), Po
int(x=53, y=63), Point(x=55, y=10), Point(x=4, y=8)], quality=1, orientation='UP')]
[Decoded(data=b'ZH-20210701-00002', type='QRCODE', rect=Rect(left=2, top=8, width=53, height=55), polygon=[Point(x=2, y=61), Po
int(x=53, y=63), Point(x=55, y=10), Point(x=4, y=8)], quality=1, orientation='UP')]
```

- 70cm



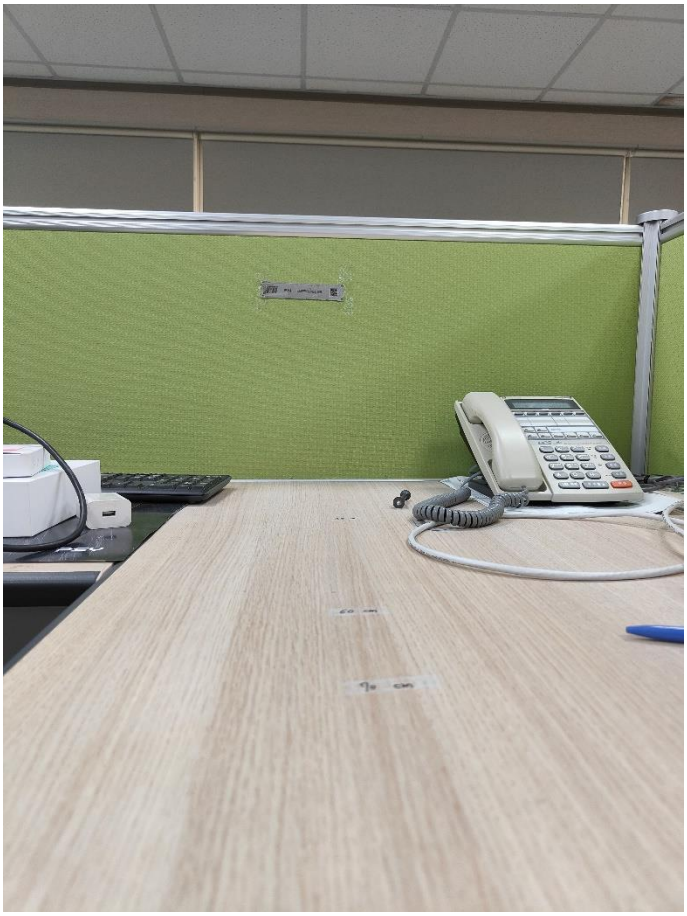
```
<class 'numpy.ndarray'>
```



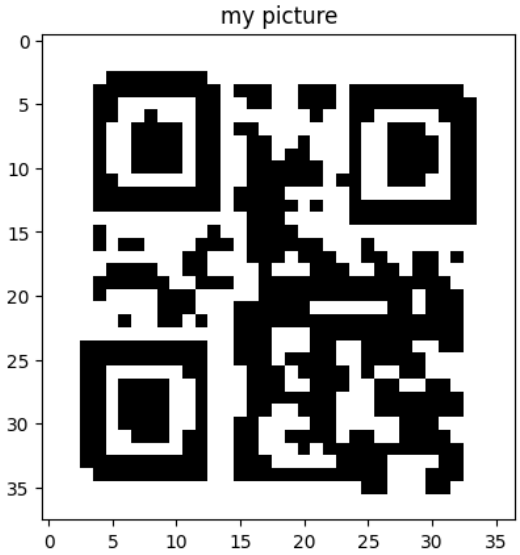
解碼結果:

```
[Decoded(data=b'ZH-20210701-00002', type='QRCODE', rect=Rect(left=3, top=8, width=44, height=46), polygon=[Point(x=3, y=52), Po
int(x=45, y=54), Point(x=47, y=9), Point(x=4, y=8)], quality=1, orientation='UP')]
[Decoded(data=b'ZH-20210701-00002', type='QRCODE', rect=Rect(left=3, top=8, width=44, height=46), polygon=[Point(x=3, y=52), Po
int(x=45, y=54), Point(x=47, y=9), Point(x=4, y=8)], quality=1, orientation='UP')]
[Decoded(data=b'ZH-20210701-00002', type='QRCODE', rect=Rect(left=3, top=8, width=44, height=46), polygon=[Point(x=3, y=52), Po
int(x=45, y=54), Point(x=47, y=9), Point(x=4, y=8)], quality=1, orientation='UP')]
[Decoded(data=b'ZH-20210701-00002', type='QRCODE', rect=Rect(left=3, top=8, width=44, height=46), polygon=[Point(x=3, y=52), Po
int(x=45, y=54), Point(x=47, y=9), Point(x=4, y=8)], quality=1, orientation='UP')]
```

- 100cm



```
<class 'NoneType'>
```



解碼結果:

```
[]
```

- 結論 ： 目前使用傳統方法做處理，可以偵測到 QRcode 位置，在 50、60、70cm 可以解碼，但在 100cm 會無法解碼。推測 100cm 下的 QRcode 太小，導致關鍵位置的 pixel 混雜在一起，陣列解碼錯誤，無法正確辨識。
- 改善方向 ：
  - 增加 AI 模型使影像修復，缺點是單張檢測會耗時很長
  - 金屬片 QRcode 加大到 2cm 以上

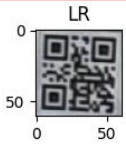
- 解決方法 1(未解決問題)
  - AI 模型(ESRGAN)，透過 GAN 還原低解析度影像，測試還原影像
  - 還原影像做增強後測試(銳化、值方圖均衡)

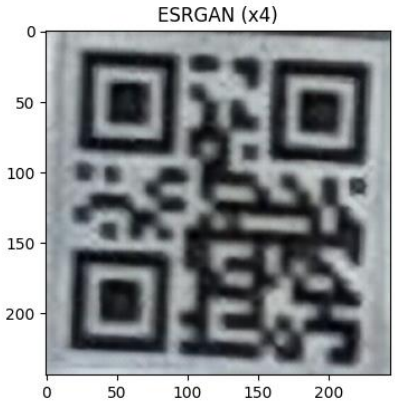
➢ 60cm

- 還原影像

```
[Decoded(data=b'ZH-20210701-00002', type='QRCODE', r
4), Point(x=220, y=238), Point(x=229, y=22), Point(x
```

解碼結果

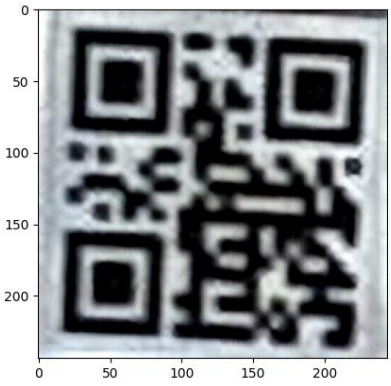


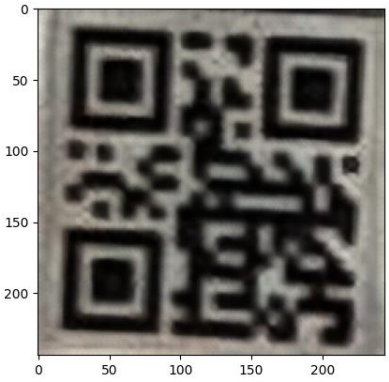


- 增強影像

```
[Decoded(data=b'ZH-20210701-00002', type='QRCODE', rect=Rect(left=17, top=14, width=212, height=224), polygon=[Point(x=17, y=22
4), Point(x=219, y=238), Point(x=229, y=22), Point(x=26, y=14)], quality=1, orientation='UP')]
```

解碼結果

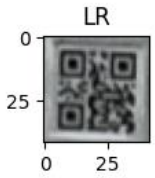


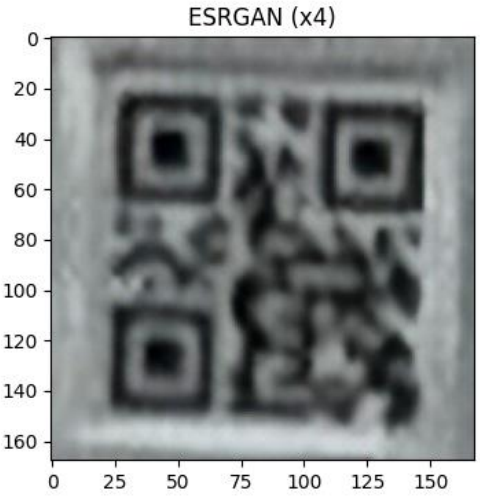


➢ 100cm

■ 還原影像

[ ] 解碼結果





■ 增強影像

[ ] 解碼結果