Enhancing licence plate numeric character detection and extraction using Super Resolution

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Keywords—super-resolution, srcnn, srgan, licence plate detection, ocr

# Introduction

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# Background

## Super-resolution (SR)

First,

#### SRCNN: A super-resolution

#### SRGAN: A super-resolution generative adversarial network (SRGAN) was proposed by C. Ledig et al. in 2017 [1] which the mean-opinion-score (MOS) scores of obtained images are closer to those of the original high-resolution images. The structure of SRGAN was presented by replacing CNN algorithm in SRCNN structure with GAN algorithm. The GAN consists of a discriminator network D which adopts the VGG network [1] and a generator network G which uses a ResNet structure [2]. In SRGAN, the generator network G tries to generate super-resolution (SR) images from low-resolution (LR) images while the discriminator D tries to identify between SR images generated from generator network G and high-resolution (HR) images. According to the performance of SRGAN, there are many works developed [4-7] which can be obtained with a satisfied result.

## Image detection

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## OCR

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# Dataset

In this study, the datasets were collected from 2 sources. According to the hypothesis that the super resolution technique can enhance the performance such as an accuracy of license plate numeric character detection and extraction, the first dataset has to be collected as the high resolution images for evaluating the test result compared with known license plate numbers. The second dataset was collected from the real world to show the result from super resolution and OCR techniques. Therefore, the license plate number in this dataset may be blurred and unreadable.

## Train/Test dataset

The dataset for training and testing has to be collected with high resolution and have clear license plate numbers. The images were collected by using a smartphone camera when the cars were stationary in the daytime. Approximately, 50 images were collected from an military base entrance in Thailand. An example of the images is shown in Fig. 1

A person standing next to a car

Description automatically generated with medium confidence

Fig. a train/test image

## Real world datset

The real world dataset was collected by using a car camera attached to the front window inside a car. The images were taken while the car was both stationary and moving. Fig. 2 is an example of real world images.

A group of cars on a road

Description automatically generated with low confidence

Fig. a train/test image

# Methodoloyg

## Super-resolution (SR)

First,

#### SRCNN: Place

#### SRGAN: Place

## Image detection

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## OCR

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# Result and Discussion

After

# Conclusion

# Future work

##### References

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