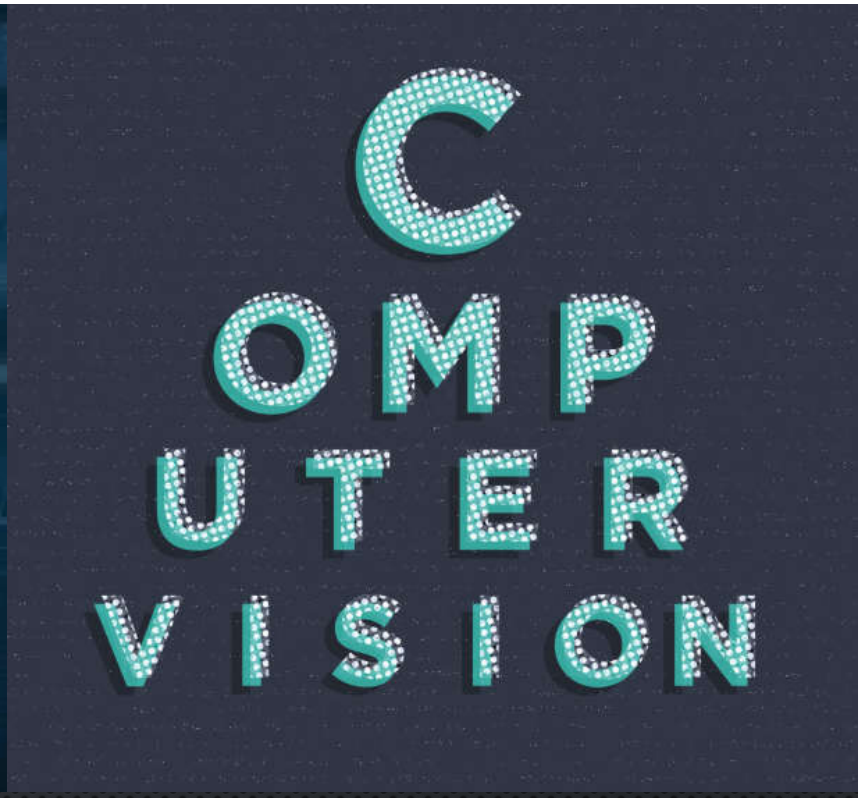


LICENCE PLATE RECOGNITION

BY GEEKS

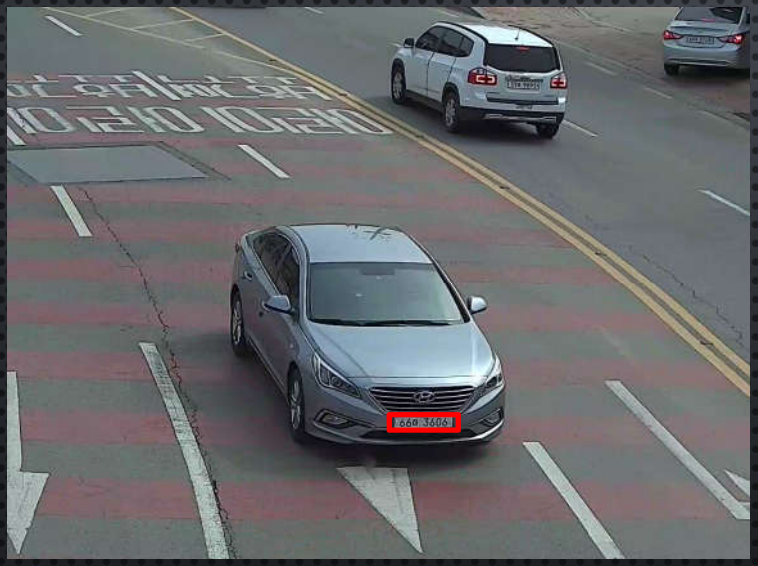
KOBILJON TOSHNAZAROV

NEMATJON NARZIEV

CONTENT

1. IDEA AND GOAL
2. PLATE DETECTOR
3. CHARACTER RECOGNIZER
4. EVALUATION
5. OUTCOME

IDEA AND GOAL

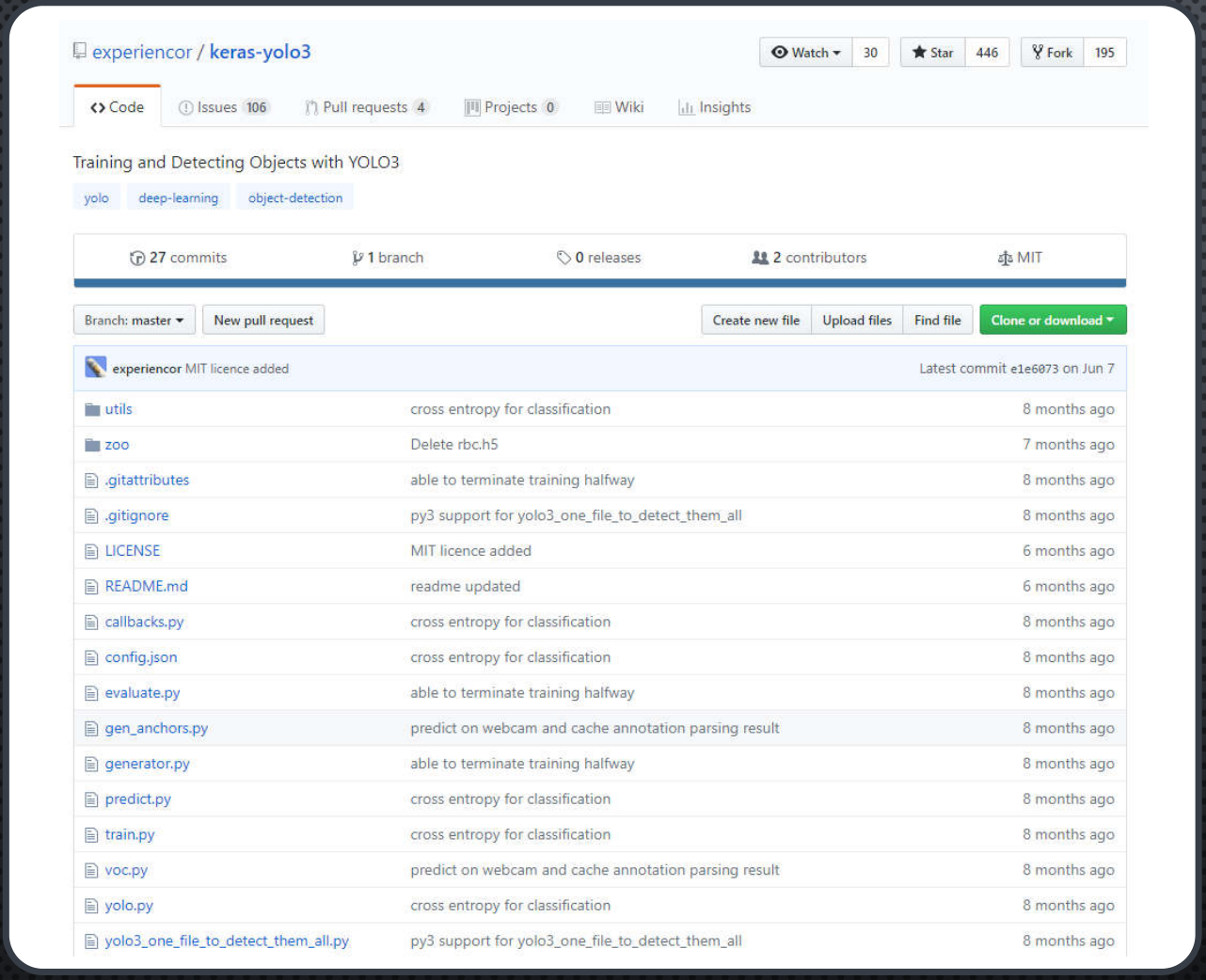


“66하 3606
”

Plate Detec
tion

Character R
ecognition

Result i
n text



experiencor / keras-yolo3

Watch 30 | Star 446 | Fork 195

Code | Issues 106 | Pull requests 4 | Projects 0 | Wiki | Insights

Training and Detecting Objects with YOLO3

yolo | deep-learning | object-detection

27 commits | 1 branch | 0 releases | 2 contributors | MIT

Branch: master | New pull request | Create new file | Upload files | Find file | Clone or download

experiencor MIT licence added — Latest commit e1e6073 on Jun 7

utils	cross entropy for classification	8 months ago
zoo	Delete rbc.h5	7 months ago
.gitattributes	able to terminate training halfway	8 months ago
.gitignore	py3 support for yolo3_one_file_to_detect_them_all	8 months ago
LICENSE	MIT licence added	6 months ago
README.md	readme updated	6 months ago
callbacks.py	cross entropy for classification	8 months ago
config.json	cross entropy for classification	8 months ago
evaluate.py	able to terminate training halfway	8 months ago
gen_anchors.py	predict on webcam and cache annotation parsing result	8 months ago
generator.py	able to terminate training halfway	8 months ago
predict.py	cross entropy for classification	8 months ago
train.py	cross entropy for classification	8 months ago
voc.py	predict on webcam and cache annotation parsing result	8 months ago
yolo.py	cross entropy for classification	8 months ago
yolo3_one_file_to_detect_them_all.py	py3 support for yolo3_one_file_to_detect_them_all	8 months ago

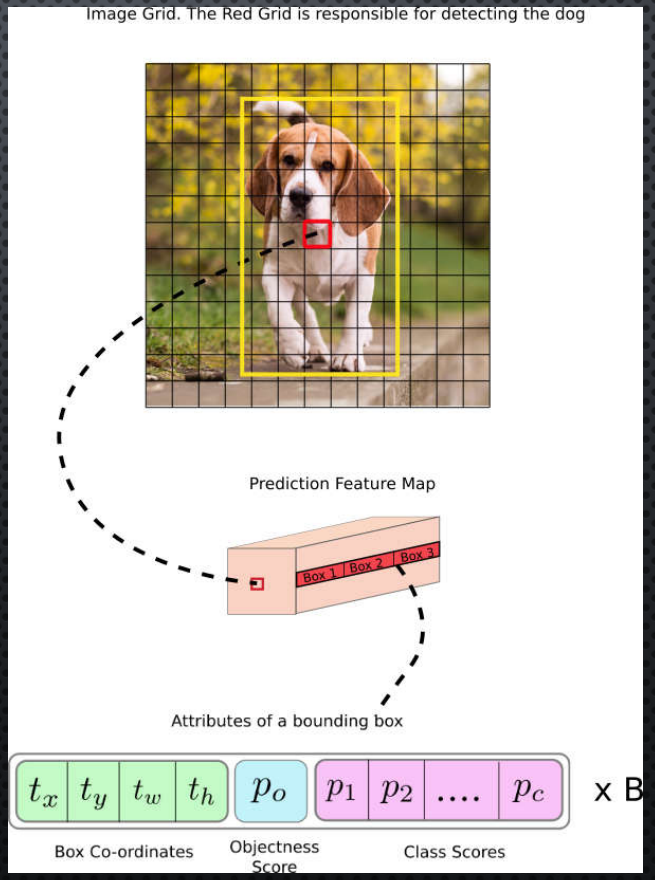
PLATE DETECTOR

YOLOV3 (KERAS)

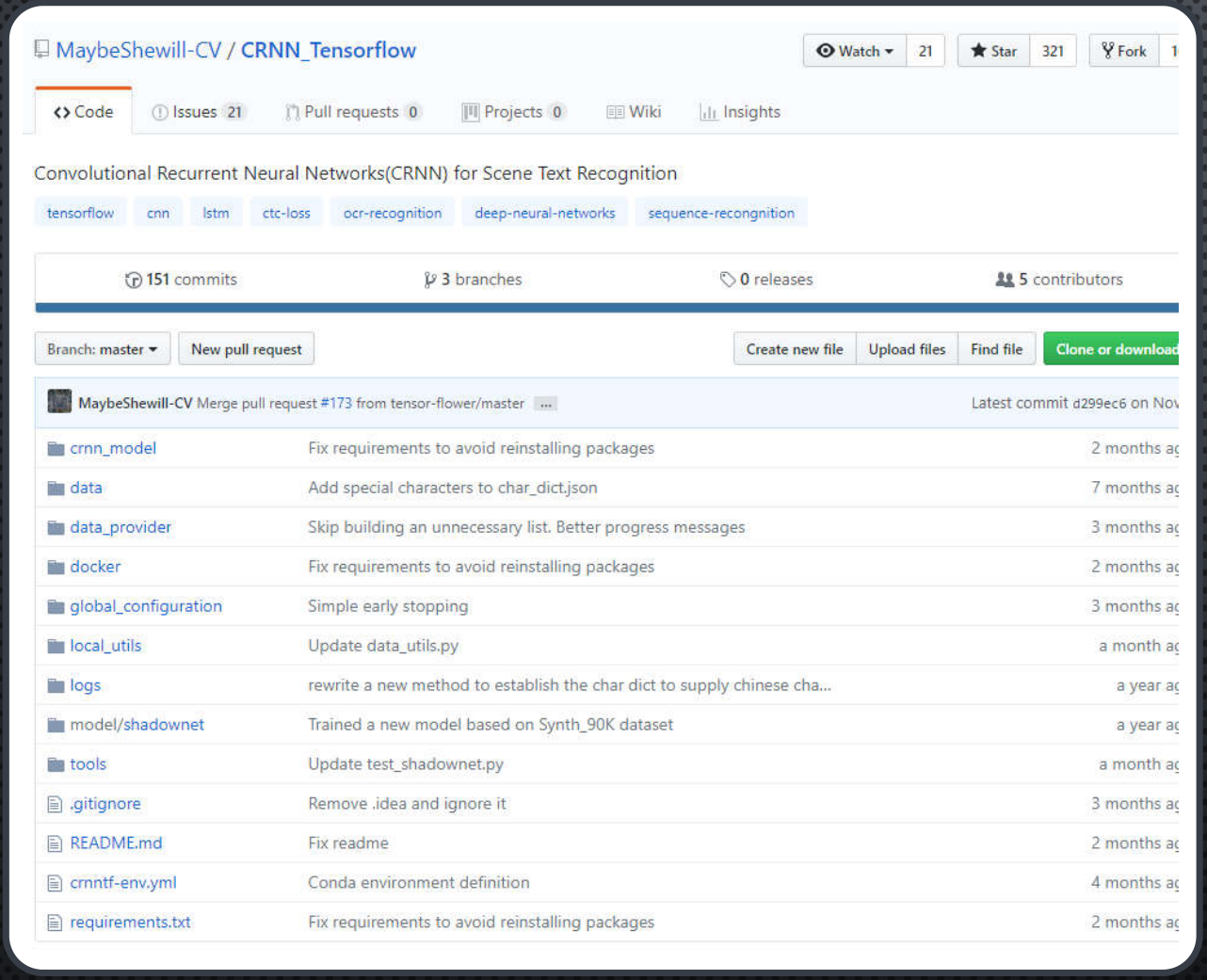
SOURCE: HTTPS://GITHUB.COM/EXPERIENCOR/KERAS-YOLO3

PLATE DETECTOR (YOLOV3)

- 100 EPOCHS
- AROUND 2,000 TRAIN SAMPLES



CHARACTER RECOGNIZER



MaybeShewill-CV / CRNN_Tensorflow

Watch 21 | Star 321 | Fork 1

Code | Issues 21 | Pull requests 0 | Projects 0 | Wiki | Insights

Convolutional Recurrent Neural Networks(CRNN) for Scene Text Recognition

tensorflow cnn lstm ctc-loss ocr-recognition deep-neural-networks sequence-recongnition

151 commits | 3 branches | 0 releases | 5 contributors

Branch: master | New pull request | Create new file | Upload files | Find file | Clone or download

MaybeShewill-CV Merge pull request #173 from tensor-flower/master ... Latest commit d299ec6 on Nov

crnn_model	Fix requirements to avoid reinstalling packages	2 months ag
data	Add special characters to char_dict.json	7 months ag
data_provider	Skip building an unnecessary list. Better progress messages	3 months ag
docker	Fix requirements to avoid reinstalling packages	2 months ag
global_configuration	Simple early stopping	3 months ag
local_utils	Update data_utils.py	a month ag
logs	rewrite a new method to establish the char dict to supply chinese cha...	a year ag
model/shadownet	Trained a new model based on Synth_90K dataset	a year ag
tools	Update test_shadownet.py	a month ag
.gitignore	Remove .idea and ignore it	3 months ag
README.md	Fix readme	2 months ag
crnntf-env.yml	Conda environment definition	4 months ag
requirements.txt	Fix requirements to avoid reinstalling packages	2 months ag

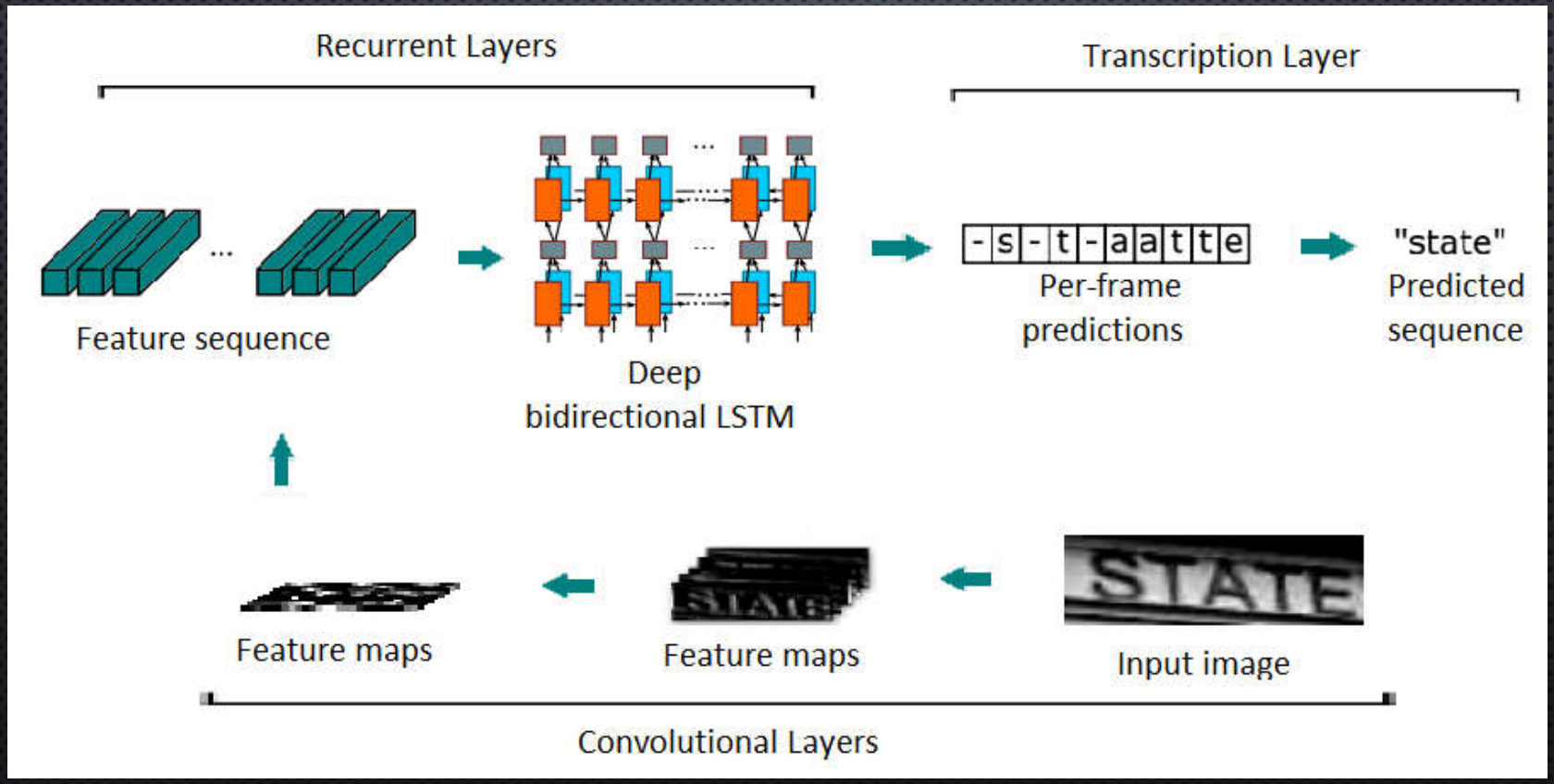
SOURCE: HTTPS://GITHUB.COM/MAYBESHEWILL-CV/CRNN_TENSORFLOW

CRNN (TENSORFLOW)

40,000 EPOCHS

4,000 TRAIN SAMPLES

CHARACTER RECOGNIZER (CRNN)



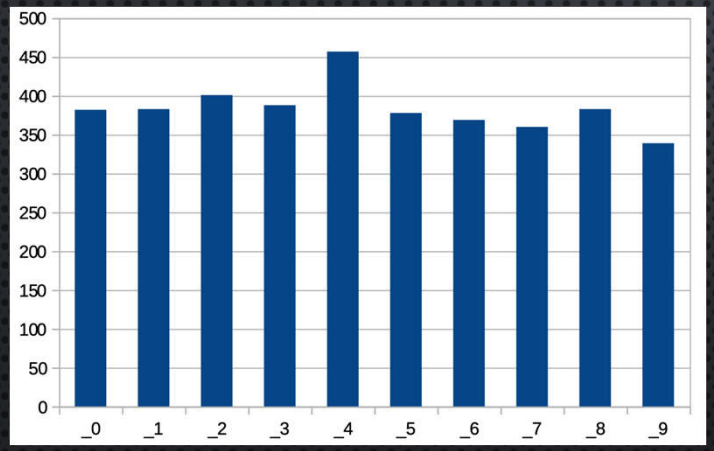
WHAT WE COVERED

Image:
* Black and White Conversion (tends to improve, by practice)
* High Image Contrast (also tends to improve the accuracy)
* Bigger plate region (bbox grouping | union, unclear)

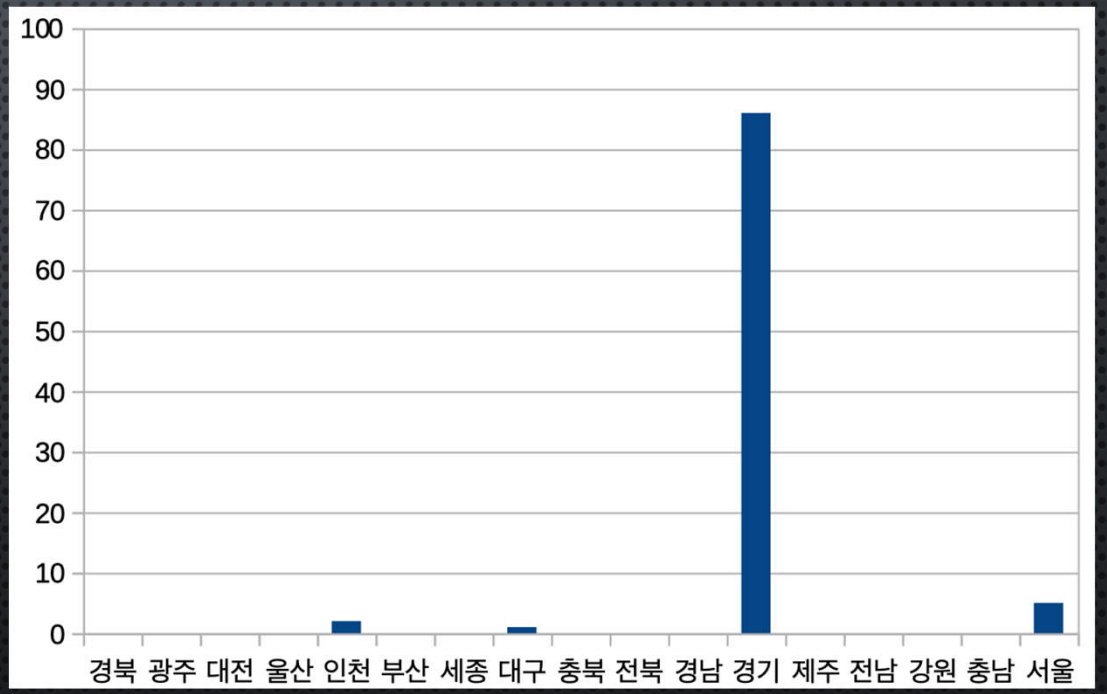
Augmentation:
Color augmentation (unnatural)
Size augmentation (natural, good for parking DS)
Angle augmentation (natural)
Blur & FX augmentation (unnatural)

Technique:
* Yolov3 → Yolov3 (very low)
* Yolov3 → CRNN (prone to improve a lot by data distribution analyzing)

DATA PREPROCESSING

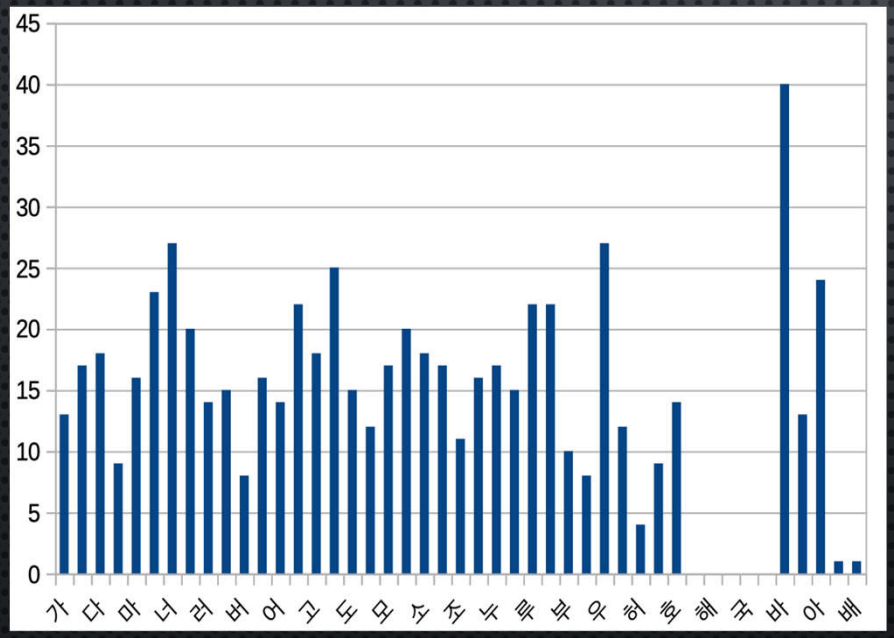


Digits distribution

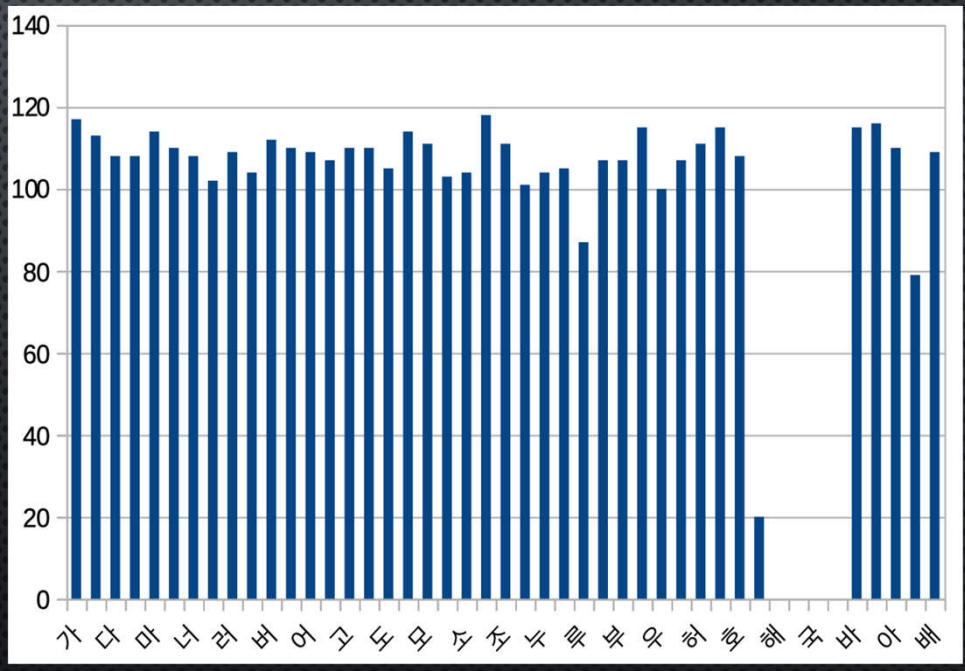


Areas distribution

DATA PREPROCESSING



Letters distribution (ground truth, untouched)



Letters distribution (modified dataset)

EVALUATION

num_bbox_examples	285
num_bbox_corrects	265
bbox_accuracy	92.98
num_rec_examples	285
num_rec_corrects	77
rec_accuracy	27.02
avg_pt	141.06
score	115.89

- PARKING TEST DATA

num_bbox_examples	451
num_bbox_corrects	354
bbox_accuracy	78.49
num_rec_examples	436
num_rec_corrects	111
rec_accuracy	25.46
avg_pt	143.26
score	99.63

- CCTV TEST DATA

OUTCOME

A BIT MORE AMOUNT OF RELEVANT DATA ON LACKING PLATE TYPES

+

MORE DETAILED DATA PRE-PROCESSING

=

THE BEST RECOGNITION

THANK YOU