- Term Project: **ICE 6059** DNN for Visual Recognition

License plate Detection and Recognition

- **Team-3**

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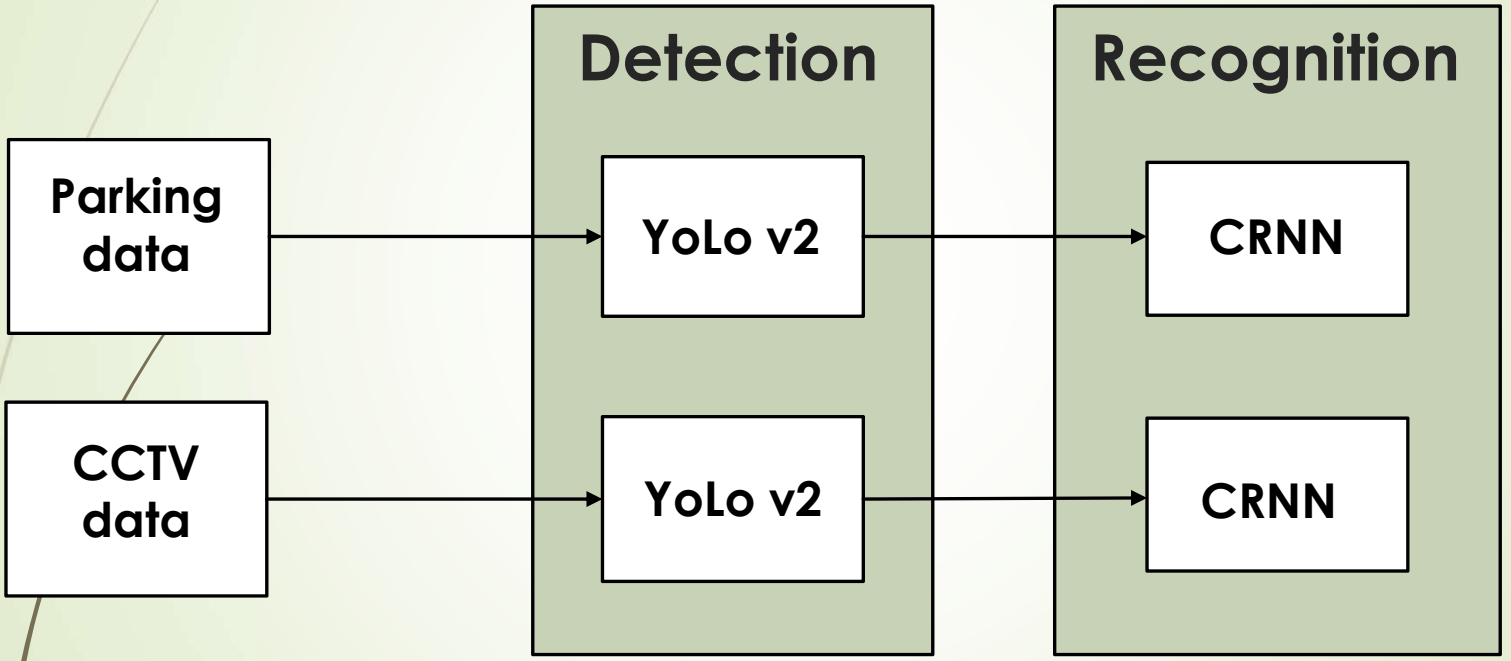
Contents

- 1. Model
- 2. Detection
- 3. Recognition
- 4. Result analysis

Model


Detection
Recognition
Parking data
CCTV data
YoLo v2
YoLo v2
CRNN
CRNN

Detection (YoLo v2)

Benefits of Yolo:

- Fast. Good for real-time processing.
- Predictions are made from one single network
- YOLO is more generalized

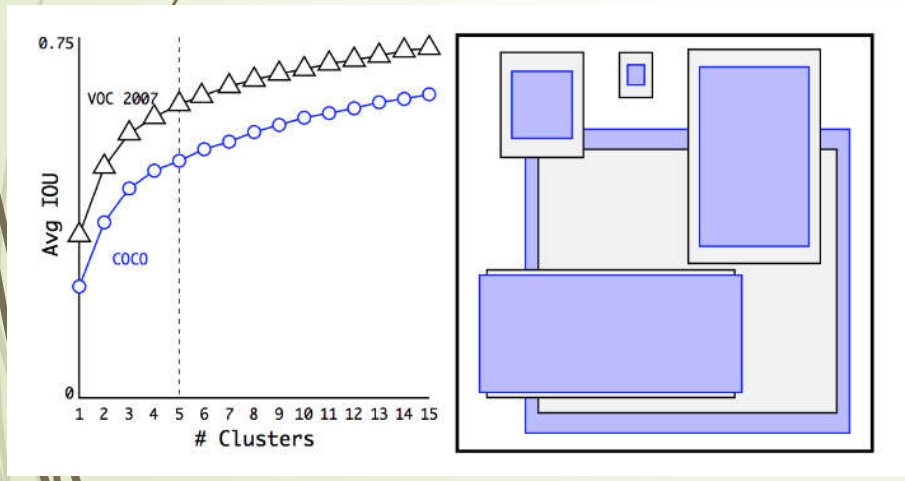
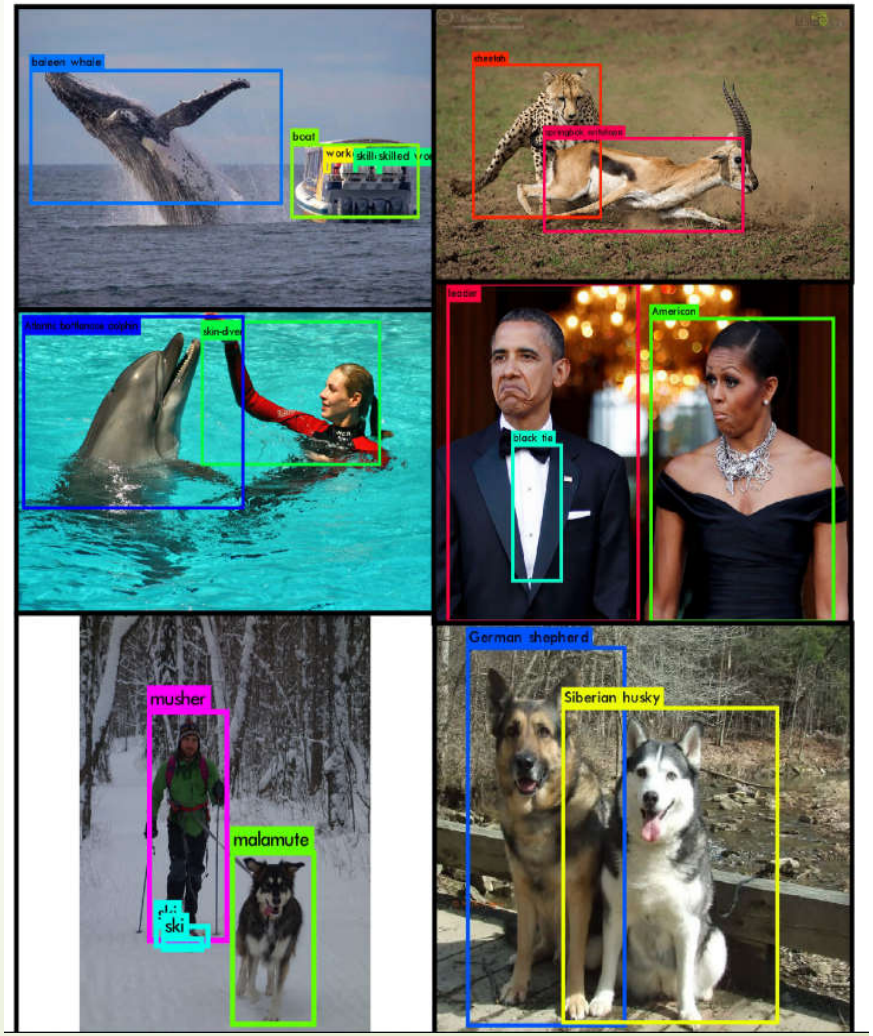


Fig: Clustering box dimensions on VOC and COCO.



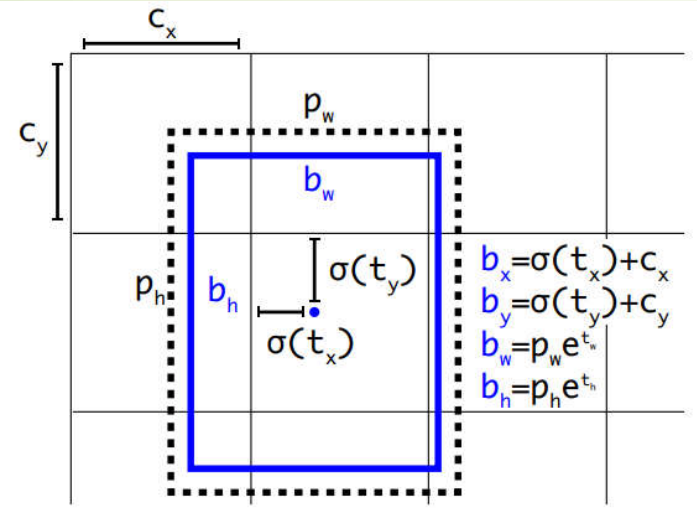


Fig: Bounding boxes with dimension priors and location prediction

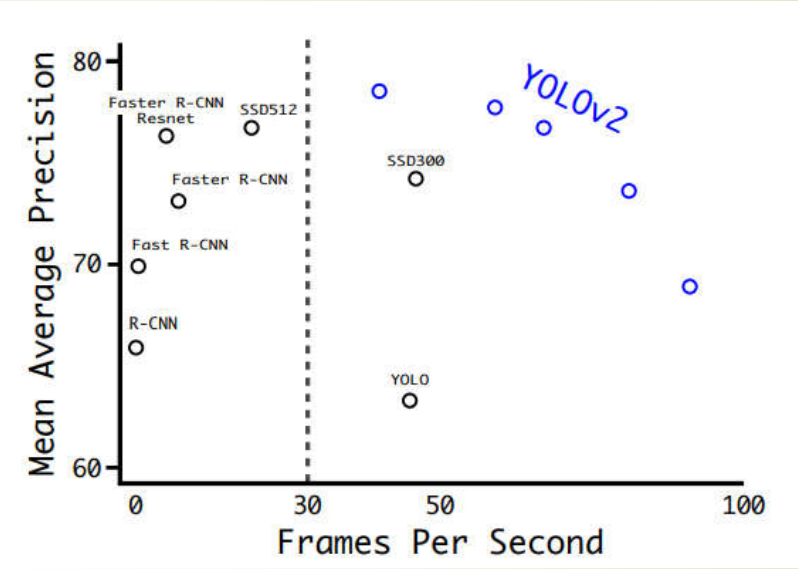
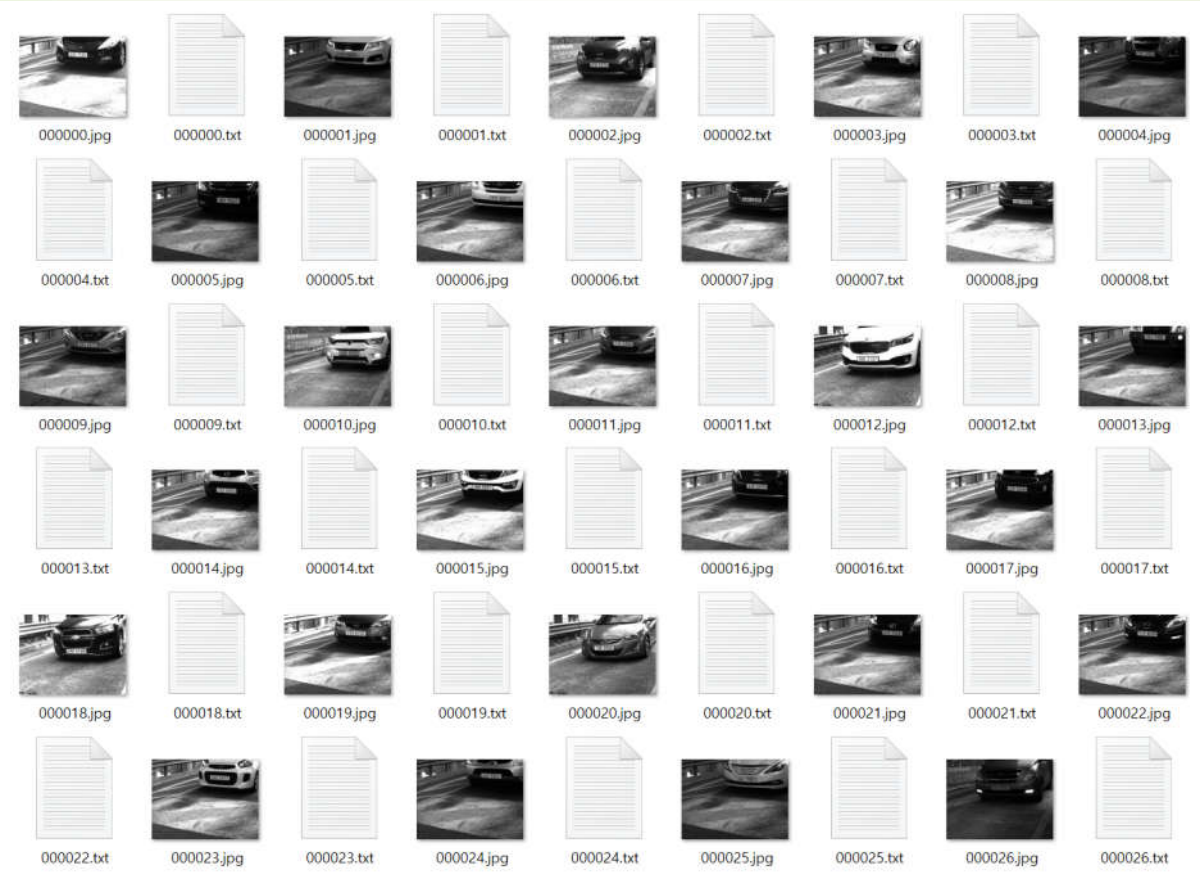


Fig: Accuracy and speed on VOC 2007

	YOLO							YOLOv2
batch norm?		✓	✓	✓	✓	✓	✓	✓
hi-res classifier?			✓	✓	✓	✓	✓	✓
convolutional?				✓	✓	✓	✓	✓
anchor boxes?				✓	✓			
new network?					✓	✓	✓	✓
dimension priors?						✓	✓	✓
location prediction?						✓	✓	✓
passthrough?							✓	✓
multi-scale?								✓
hi-res detector?								✓
VOC2007 mAP	63.4	65.8	69.5	69.2	69.6	74.4	75.4	76.8	**78.6**

Detection (YoLo v2) - Training

Whole set of parking and cctv



Recognition(CRNN)

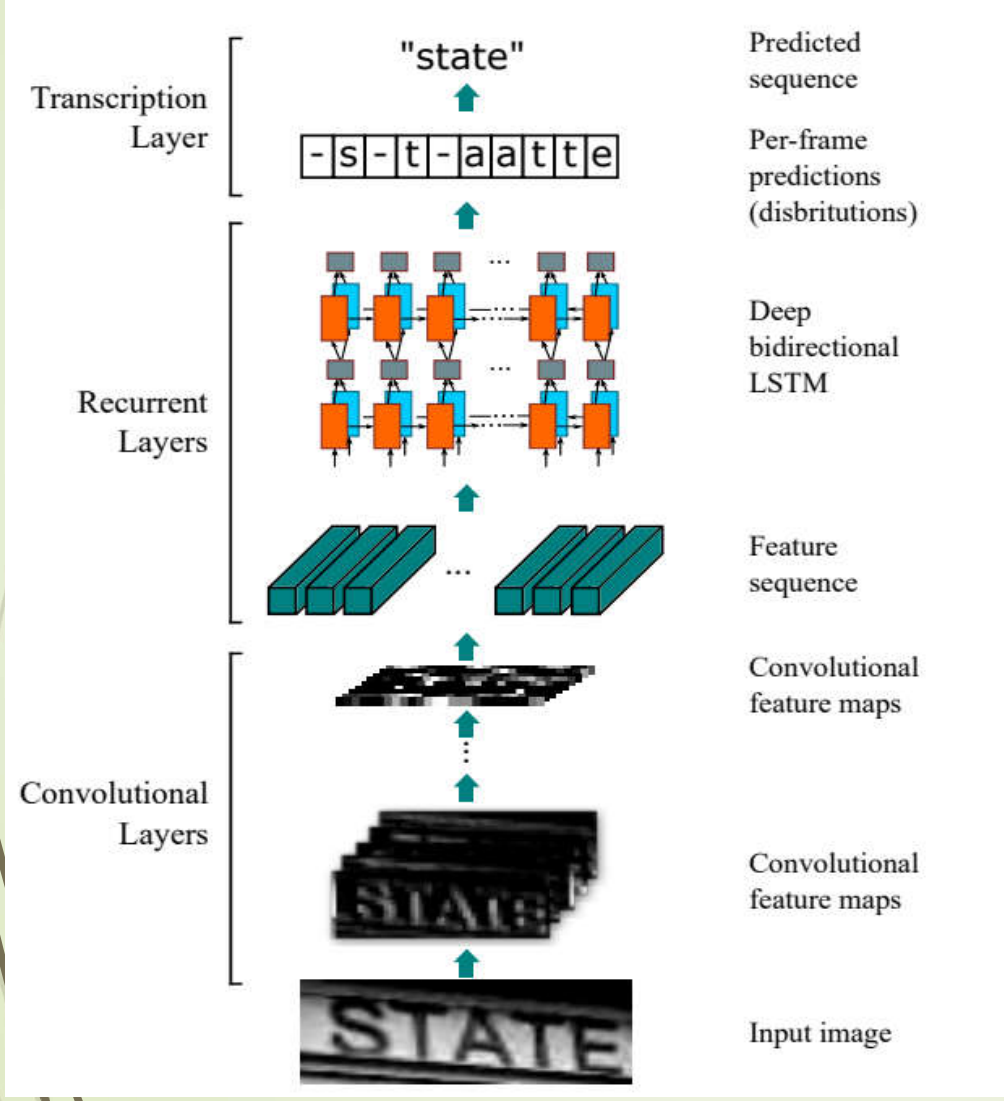


Fig: The network architecture.

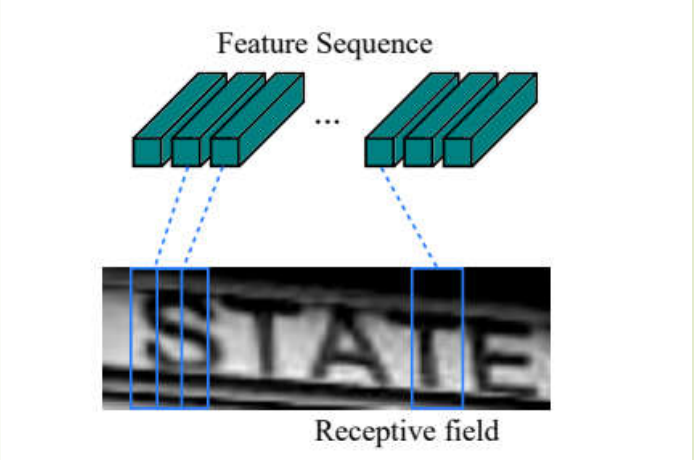


Fig: The receptive Field

Benefits of CRNN:

- End-to-end learning is possible.
- Sequence data of arbitrary length can be processed because of LSTM which is free in size of input and output sequence.
- There is no need for a detector or cropping technique to find each character one by one.

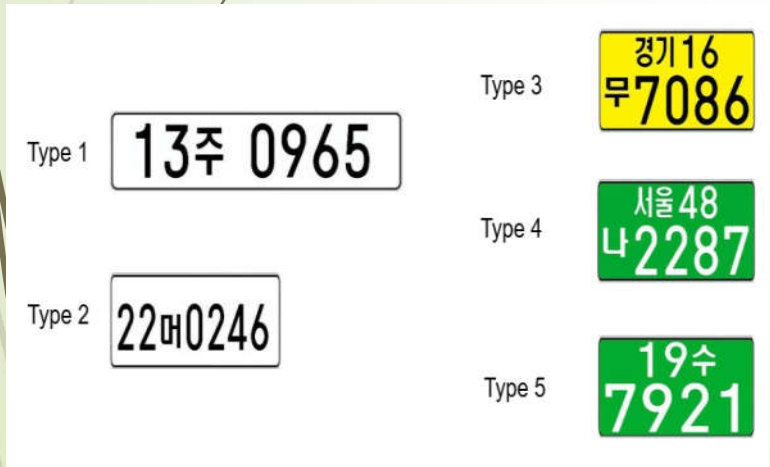


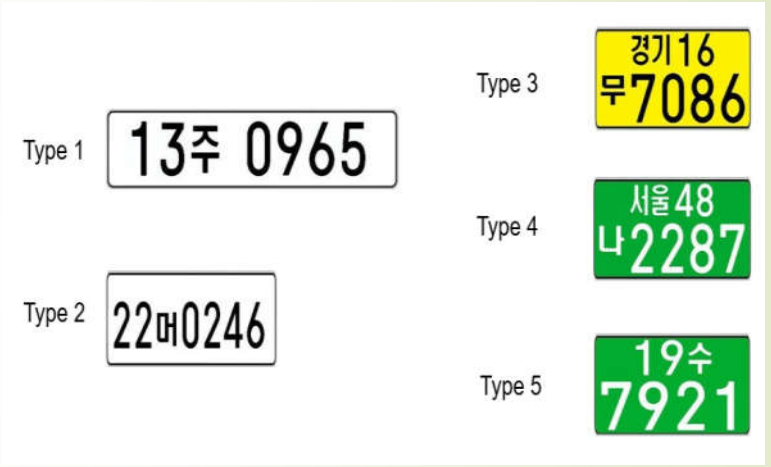
Fig: Korean license plates

Fig: Recognition Using CRNN

Recognition(CRNN) – Training

Plate from parking and cctv

Image generator from git



(exmaple) A18sk6897

A : 서울

sk : 나

Result analysis

	A	B	C
1	Parking		
2			
3	num_bbox_examples	285	
4	num_bbox_corrects	285	
5	bbox_accuracy	100	
6	num_rec_examples	285	
7	num_rec_corrects	161	
8	rec_accuracy	56.49	
9	avg_pt	134.16	
10	score	153.08	

	A	B
1	CCTV	
2		
3	num_bbox_examples	451
4	num_bbox_corrects	331
5	bbox_accuracy	73.39
6	num_rec_examples	436
7	num_rec_corrects	102
8	rec_accuracy	23.39
9	avg_pt	229.04
10	score	83.88


Thanks