

# Presentations for the Final Project


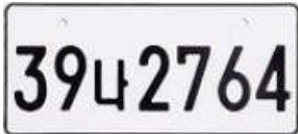




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# Dataset

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# License Plate Type

Type	License Plate	Type
1		P1
2		P2
3		P3
4		P4
5		P5
6		P6

서울52바3108

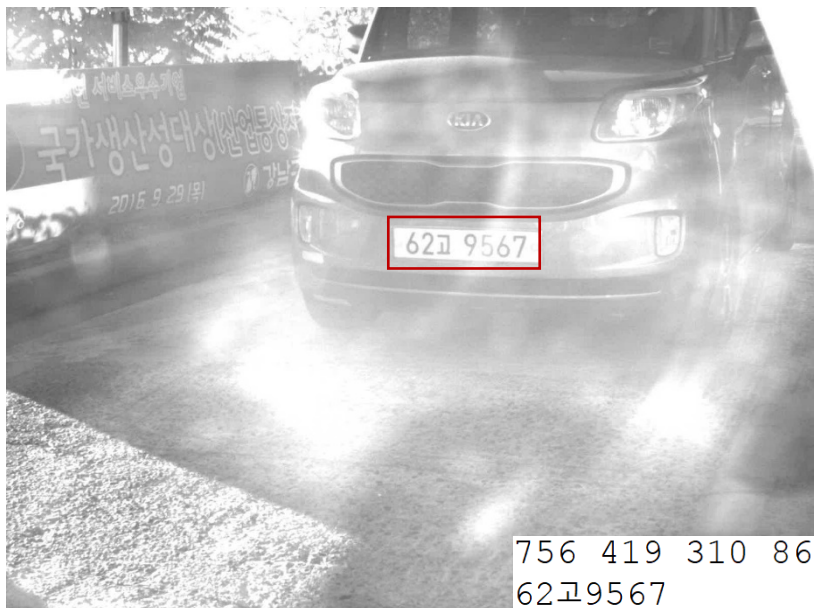
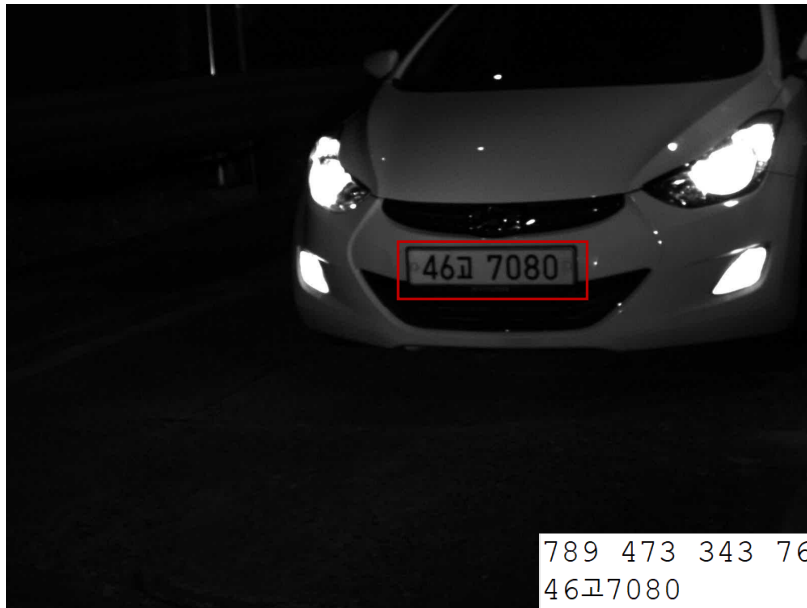
서울52바3108

43가6510

부산27무6662

Recognizing  
plate type is  
not our task

# Parking Data (285 Test Samples)





# CCTV Data (451 Test Samples)



- Every test image includes one plate that near to the camera only!

# Metrics for Final Project

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# Final Project

## Subject:

- License Plate Recognition (LPR)



## Deep Learning Platform:



# Definition of the Score

$$Score = Score_{park} + Score_{cctv} + 0.1 \times (100 - PT_{park}) + 0.1 \times (100 - PT_{cctv})$$

$$PT = msec./image(average)$$

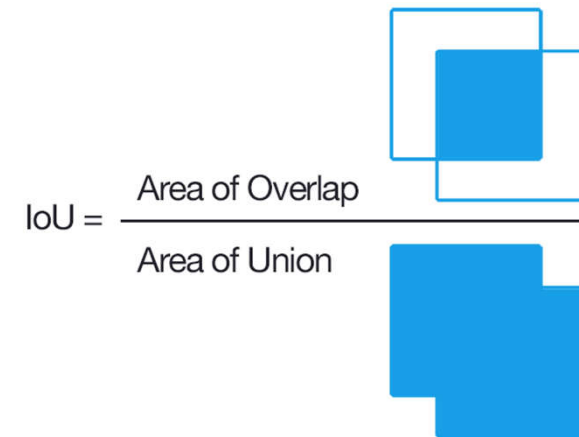
$$Score_i = Accuracy_{det} + Accuracy_{rec} \quad (i = park \text{ or } cctv)$$

Range: [-Inf ~ 420]

$$Accuracy_{det} = \frac{1}{n} \sum_{i=0}^{n-1} \frac{\#TP_{det} - \#FP_{det}}{\#GT} \times 100\%$$

$$Accuracy_{rec} = \frac{1}{n} \sum_{i=0}^{n-1} \frac{\#TP_{rec}}{\#GT} \times 100\%$$

- PT: average processing time of the model (unit: msec.)
- $\#TP_{det}$ : number of true positive for detection
- $\#FP_{det}$ : number of false positive for detection
- $\#TP_{rec}$ : number of true positive for recognition
- $\#GT$ : number of ground-truth



- $TP_{det}$ :  $IoU \geq \theta, \theta=0.7$
- $FP_{det}$ :  $IoU < \theta$

Wrong!

GT: 3	7	구	5	1	8	5
↕	↕	↕	↕	↕	↕	↕
PR: 3	7	조	5	1	8	5



# Competition Results

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15 mins. Presentation

5 mins. Q & A

# Teams

No.	Team Name	Members	Num. of Students	Deep learning library
1	ICVL	배규호, 수랴	2	
2	Team 1	송광호, 이윤선 이화선	3	
3	Team 2	윤정언, 이반, 최준호	2	
4	Team 3	이명오, 알만, 홍대용	2	
5	AI Lab	아자맛, 자와힐, 아지즈	3	
6	SBS	쇼크루, 뷔노벙, 사이드라술콘	3	
7	Geeks	네마트전, 코필전	2	

# Competition Results (Ranking 7)



Team	parking				cctv				Total
	Det acc (%)	Rec acc (%)	PT (ms)	Score	Det acc (%)	Rec acc (%)	PT (ms)	Score	
1									
2									
3									
4									
5									
6									
7 Team1	32.98	4.56	98.91	37.65	79.60	7.80	183.35	79.06	116.71

Parking: #285

CCTV: #451

# Competition Results (Ranking 6)



Team	parking				cctv					
	Det acc (%)	Rec acc (%)	PT (ms)	Score	Det acc (%)	Rec acc (%)	PT (ms)	Score	Total	
1										
2										
3										
4										
5										
6	AI Lab	98.95	56.14	115.51	153.54	32.59	27.52	101.57	59.96	213.50
7	Team1	32.98	4.56	98.91	37.65	79.60	7.80	183.35	79.06	116.71

Parking: #285

CCTV: #451

# Competition Results (Ranking 5)



Team		parking				cctv				
		Det acc (%)	Rec acc (%)	PT (ms)	Score	Det acc (%)	Rec acc (%)	PT (ms)	Score	Total
1										
2										
3										
4										
5	Geek	92.98	27.02	141.06	115.89	78.49	25.46	143.26	99.63	215.52
6	AI Lab	98.95	56.14	115.51	153.54	32.59	27.52	101.57	59.96	213.50
7	Team1	32.98	4.56	98.91	37.65	79.60	7.80	183.35	79.06	116.71

Parking: #285

CCTV: #451



# Competition Results (Ranking 4)



Team		parking				cctv				
		Det acc (%)	Rec acc (%)	PT (ms)	Score	Det acc (%)	Rec acc (%)	PT (ms)	Score	Total
1										
2										
3										
4	Team3	100.00	56.49	134.16	153.08	73.39	23.39	229.04	83.88	236.96
5	Geek	92.98	27.02	141.06	115.89	78.49	25.46	143.26	99.63	215.52
6	AI Lab	98.95	56.14	115.51	153.54	32.59	27.52	101.57	59.96	213.50
7	Team1	32.98	4.56	98.91	37.65	79.60	7.80	183.35	79.06	116.71

Parking: #285

CCTV: #451

# Competition Results (Ranking 3)



Team	parking				cctv					
	Det acc (%)	Rec acc (%)	PT (ms)	Score	Det acc (%)	Rec acc (%)	PT (ms)	Score	Total	
1										
2										
3	SBS	97.89	51.93	112.28	148.60	80.27	45.18	109.35	124.51	273.11
4	Team3	100.00	56.49	134.16	153.08	73.39	23.39	229.04	83.88	236.96
5	Geek	92.98	27.02	141.06	115.89	78.49	25.46	143.26	99.63	215.52
6	AI Lab	98.95	56.14	115.51	153.54	32.59	27.52	101.57	59.96	213.50
7	Team1	32.98	4.56	98.91	37.65	79.60	7.80	183.35	79.06	116.71

Parking: #285

CCTV: #451

# Competition Results (Ranking 2)



Team	parking				cctv					
	Det acc (%)	Rec acc (%)	PT (ms)	Score	Det acc (%)	Rec acc (%)	PT (ms)	Score	Total	
1										
2	ICVL	85.26	58.95	192.97	134.91	90.91	60.55	202.49	141.21	276.12
3	SBS	97.89	51.93	112.28	148.60	80.27	45.18	109.35	124.51	273.11
4	Team3	100.00	56.49	134.16	153.08	73.39	23.39	229.04	83.88	236.96
5	Geek	92.98	27.02	141.06	115.89	78.49	25.46	143.26	99.63	215.52
6	AI Lab	98.95	56.14	115.51	153.54	32.59	27.52	101.57	59.96	213.50
7	Team1	32.98	4.56	98.91	37.65	79.60	7.80	183.35	79.06	116.71

Parking: #285

CCTV: #451

# Competition Results (Ranking 1)




Team	parking				cctv				Total
	Det acc (%)	Rec acc (%)	PT (ms)	Score	Det acc (%)	Rec acc (%)	PT (ms)	Score	
1 Team2	94.74	64.21	71.84	161.76	88.47	61.70	116.95	148.47	310.23
2 ICVL	85.26	58.95	192.97	134.91	90.91	60.55	202.49	141.21	276.12
3 SBS	97.89	51.93	112.28	148.60	80.27	45.18	109.35	124.51	273.11
4 Team3	100.00	56.49	134.16	153.08	73.39	23.39	229.04	83.88	236.96
5 Geek	92.98	27.02	141.06	115.89	78.49	25.46	143.26	99.63	215.52
6 AI Lab	98.95	56.14	115.51	153.54	32.59	27.52	101.57	59.96	213.50
7 Team1	32.98	4.56	98.91	37.65	79.60	7.80	183.35	79.06	116.71

Parking: #285

CCTV: #451

# How to Become a Good DL Engineer

- Machine Learning course
  - Deep Learning school
  - PhD student process
    - Read papers (how to get a idea?)
    - Replicate results (how to get a idea?)
  - Dirty work
    - Going on internet, downloading data, cleaning data or download a piece of codes, tuning parameters to see what happened, or debugging to check why it overflow, or optimize database, hacking GPU kernel to make it faster
- Great Researchers
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Note: some experts only do the dirty work



**Thank you for your attention!**