Congestion Analyzer

EatCoder

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용영재 - 1292027

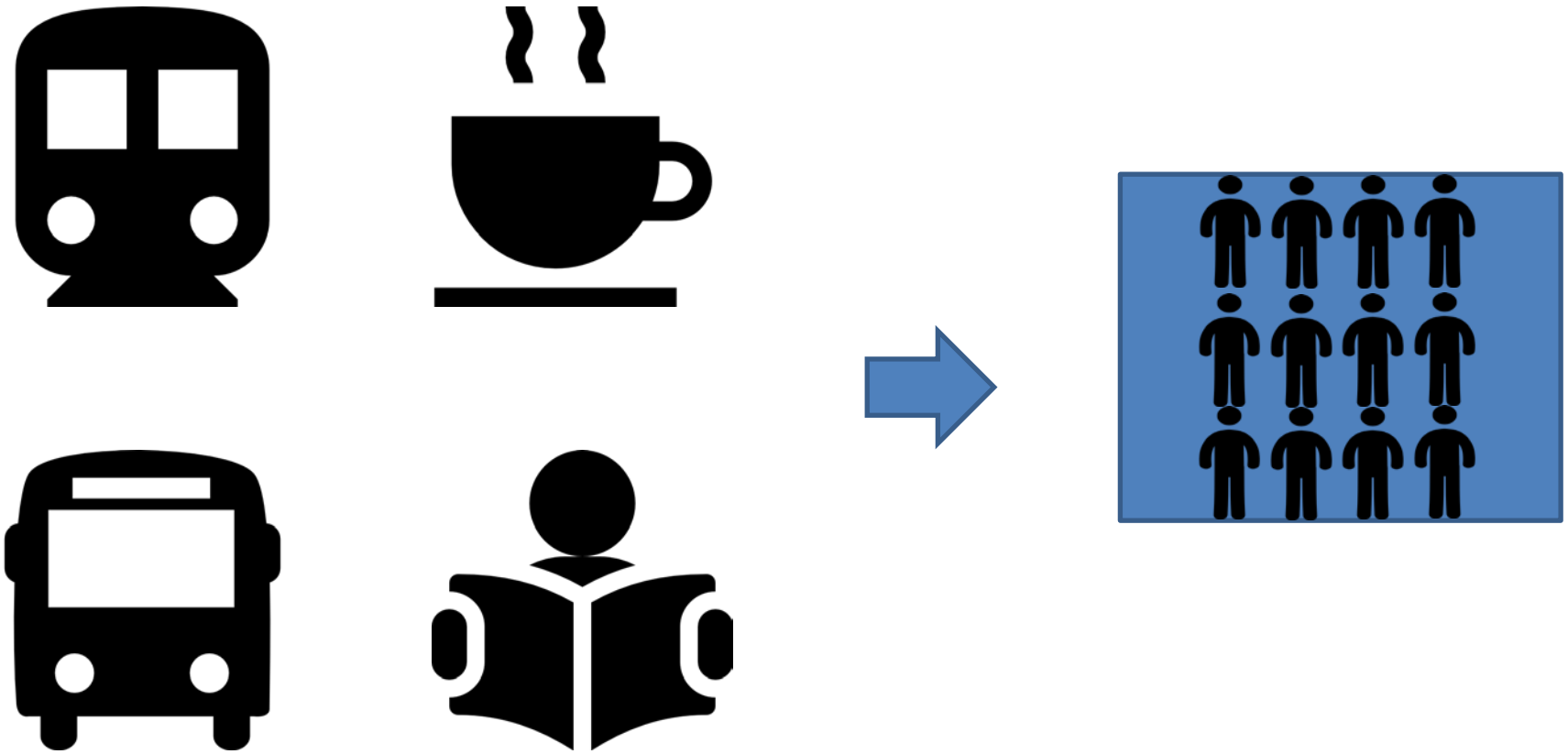
Intro

1. 프로젝트 개요
2. 프로젝트 구조
3. 프로젝트 진행상황
4. Q&A

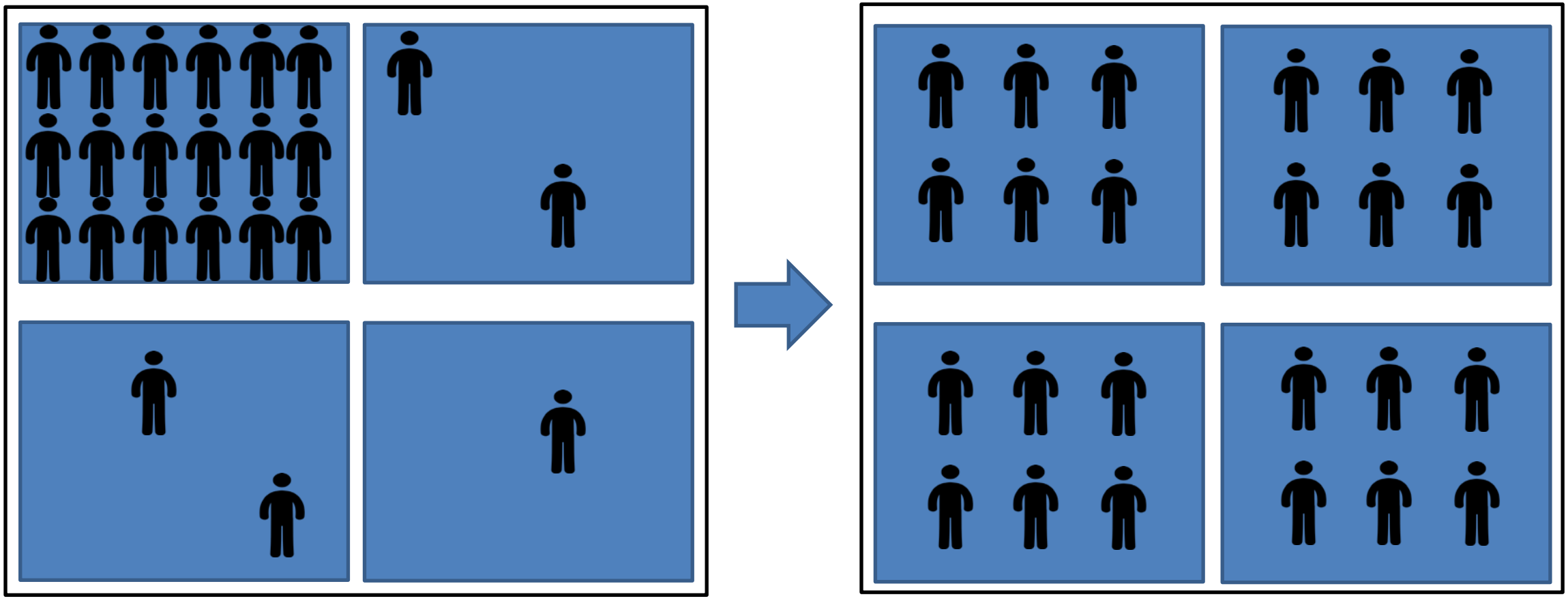
프로젝트 개요

프로젝트 개요

인원이 집중되는 장소

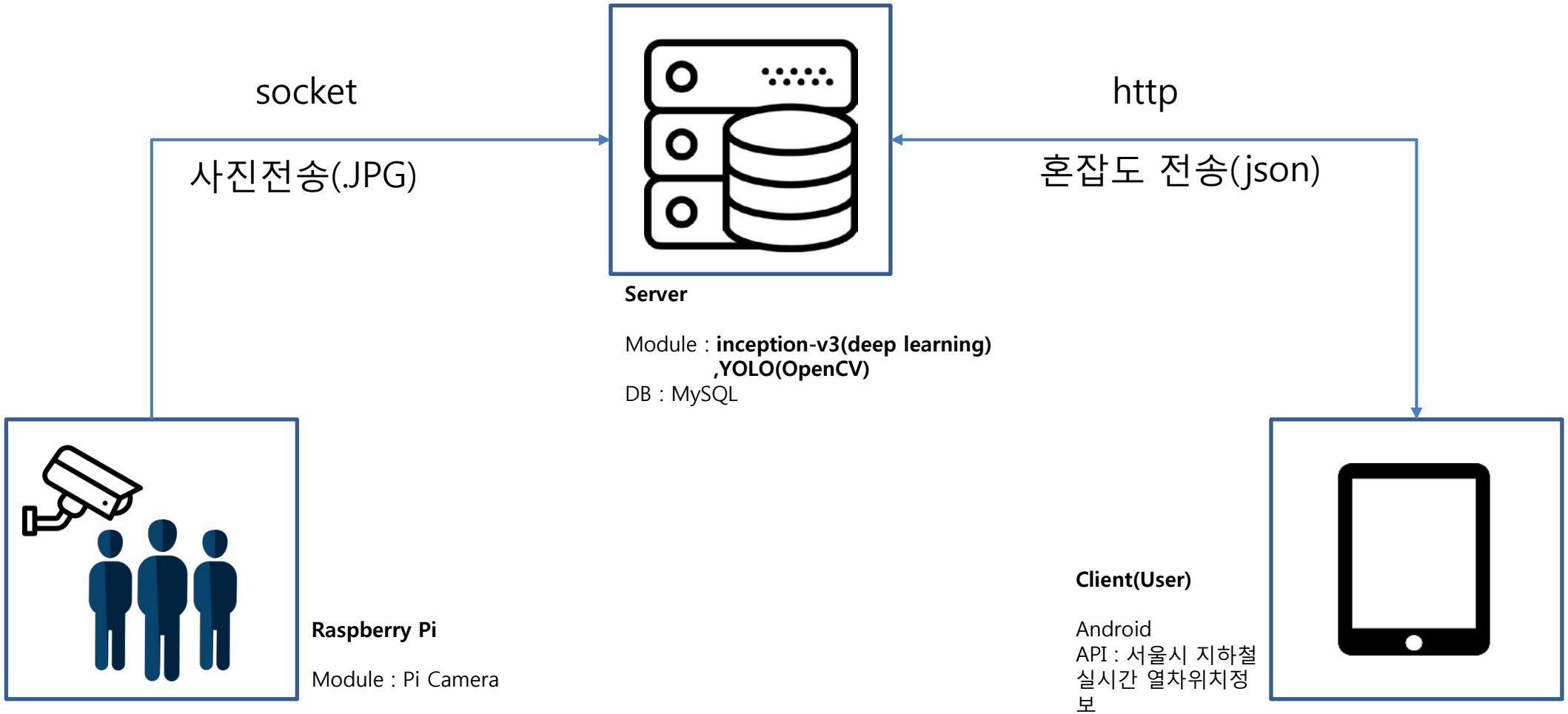


특정 시간대, 특정 칸, 특정 구역



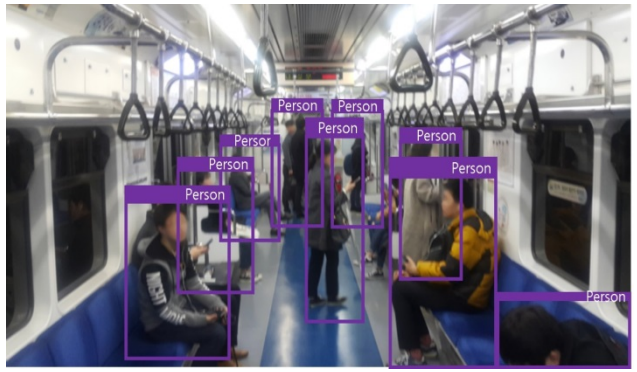
프로젝트 구조

프로젝트 구조


socket
사진전송(.JPG)
http
혼잡도 전송(json)
Server
Module : inception-v3(deep learning)
,YOLO(OpenCV)
DB : MySQL
Raspberry Pi
Module : Pi Camera
Client(User)
Android
API : 서울시 지하철
실시간 열차위치정
보

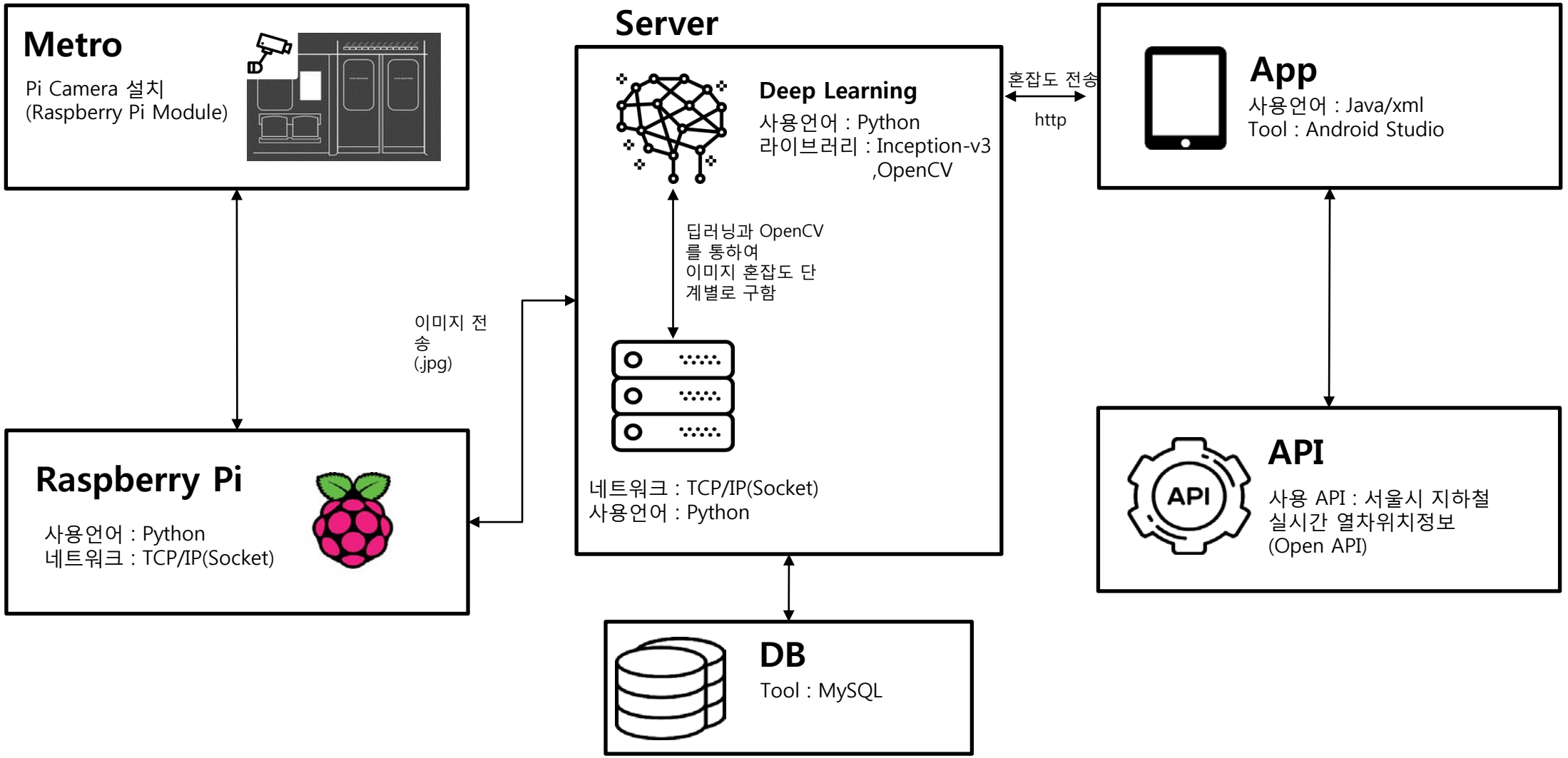
프로젝트 구조

OpenCV



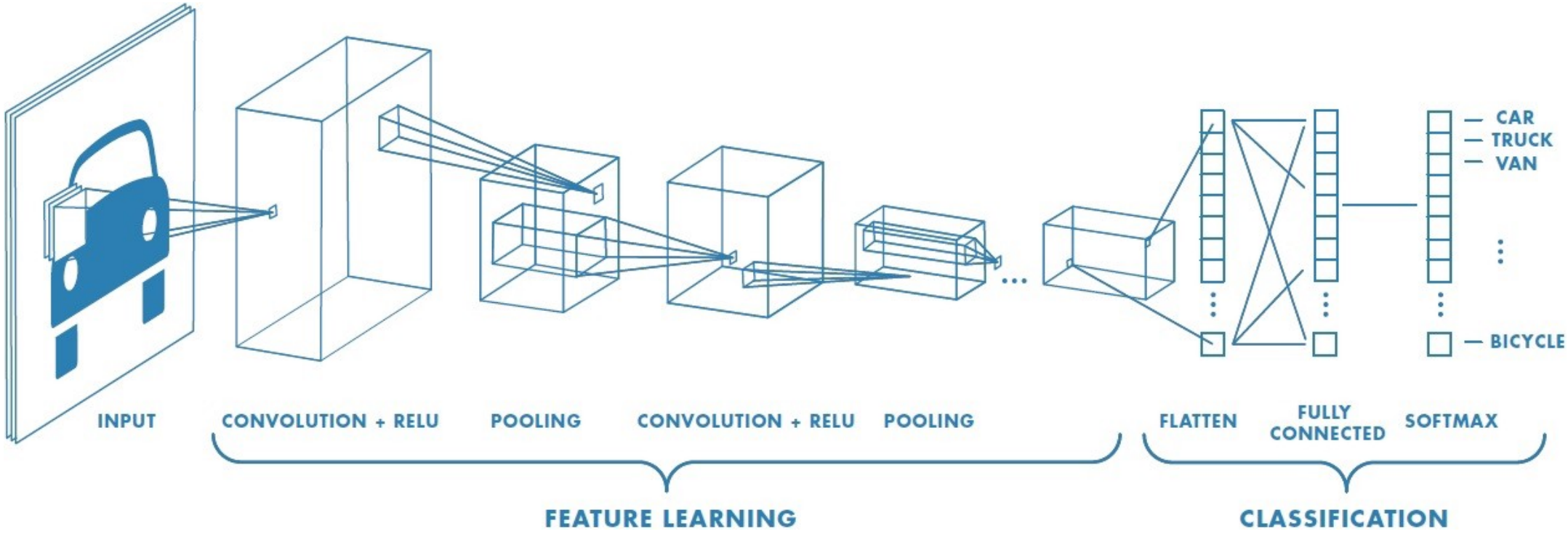
Deep Learning

프로젝트 구조


Metro
Pi Camera 설치
(Raspberry Pi Module)
Server
Deep Learning
사용언어 : Python
라이브러리 : Inception-v3
,OpenCV
혼잡도 전송
http
App
사용언어 : Java/xml
Tool : Android Studio
딥러닝과 OpenCV
를 통하여
이미지 혼잡도 단
계별로 구함
이미지 전
송
(.jpg)
Raspberry Pi
사용언어 : Python
네트워크 : TCP/IP(Socket)
네트워크 : TCP/IP(Socket)
사용언어 : Python
API
API
사용 API : 서울시 지하철
실시간 열차위치정보
(Open API)
DB
Tool : MySQL

프로젝트 진행상황

CNN



Input – Conv – RELU – Pool – RELU – Conv – RELU – PooL – Fully connected

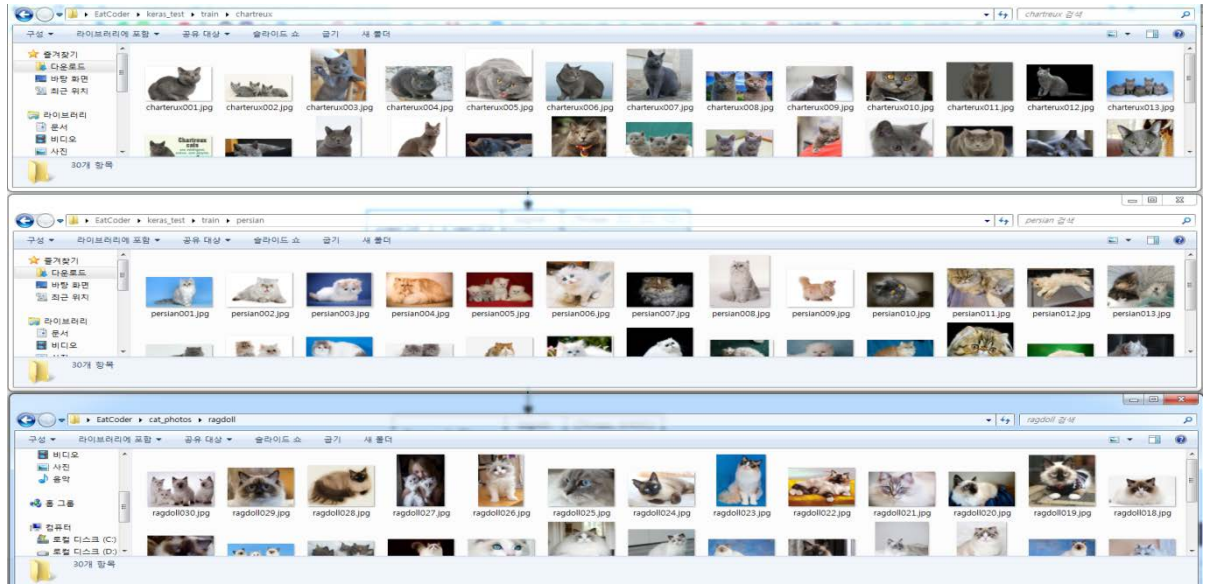
프로젝트 진행상황(DeepLearning 이전)

Keras : neural networks API

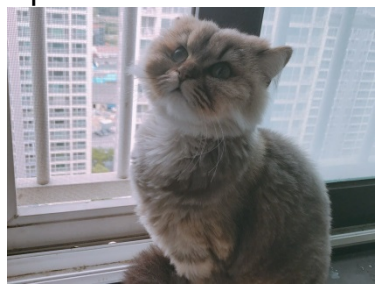
모델 구성

conv2d_1_input: InputLayer	input:	(None, 24, 24, 3)
	output:	(None, 24, 24, 3)
conv2d_1: Conv2D	input:	(None, 24, 24, 3)
	output:	(None, 22, 22, 32)
conv2d_2: Conv2D	input:	(None, 22, 22, 32)
	output:	(None, 20, 20, 64)
max_pooling2d_1: MaxPooling2D	input:	(None, 20, 20, 64)
	output:	(None, 10, 10, 64)
flatten_1: Flatten	input:	(None, 10, 10, 64)
	output:	(None, 6400)
dense_1: Dense	input:	(None, 6400)
	output:	(None, 128)
dense_2: Dense	input:	(None, 128)
	output:	(None, 3)

Train data



input data



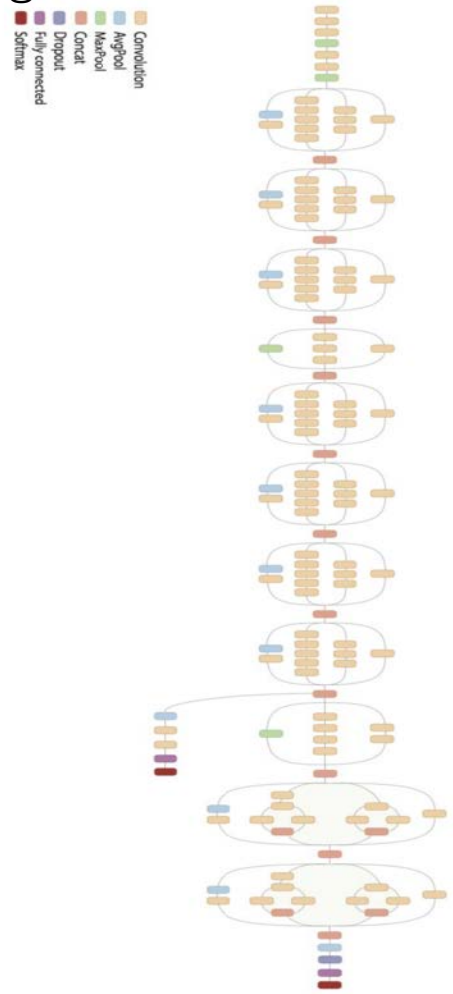
result

```
{'ragdoll': 2, 'chartreux': 0, 'persian': 1}
['persian₩₩temp.jpg']
[[0.316 0.683 0.001]]
```

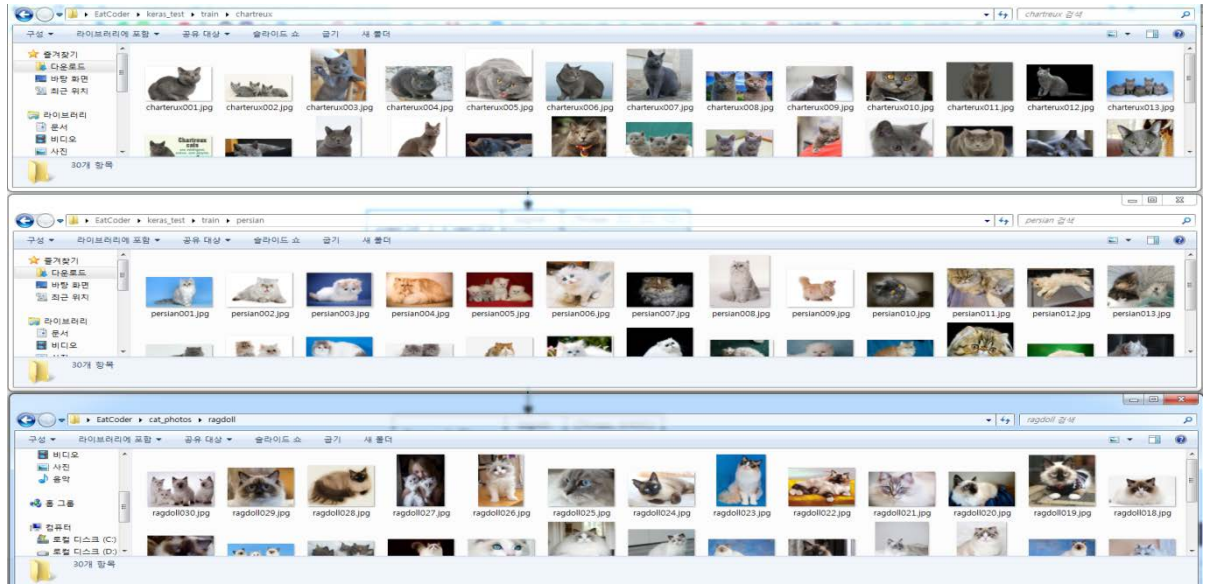
프로젝트 진행상황(DeepLearning 현재)

Inception-v3

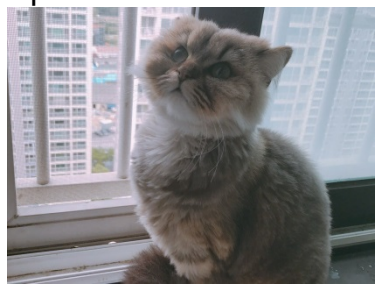
모델 구성



Train data



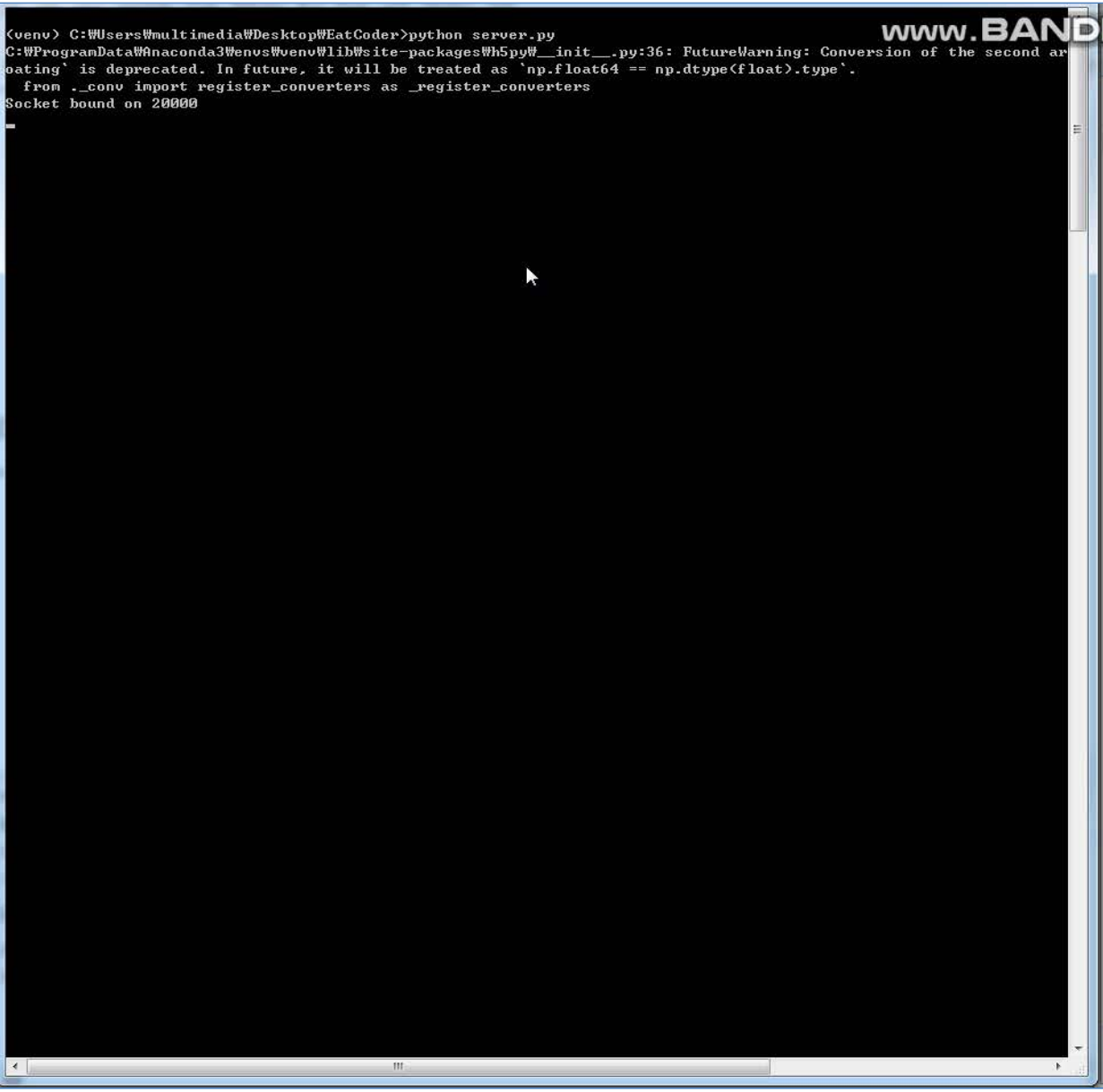
input data

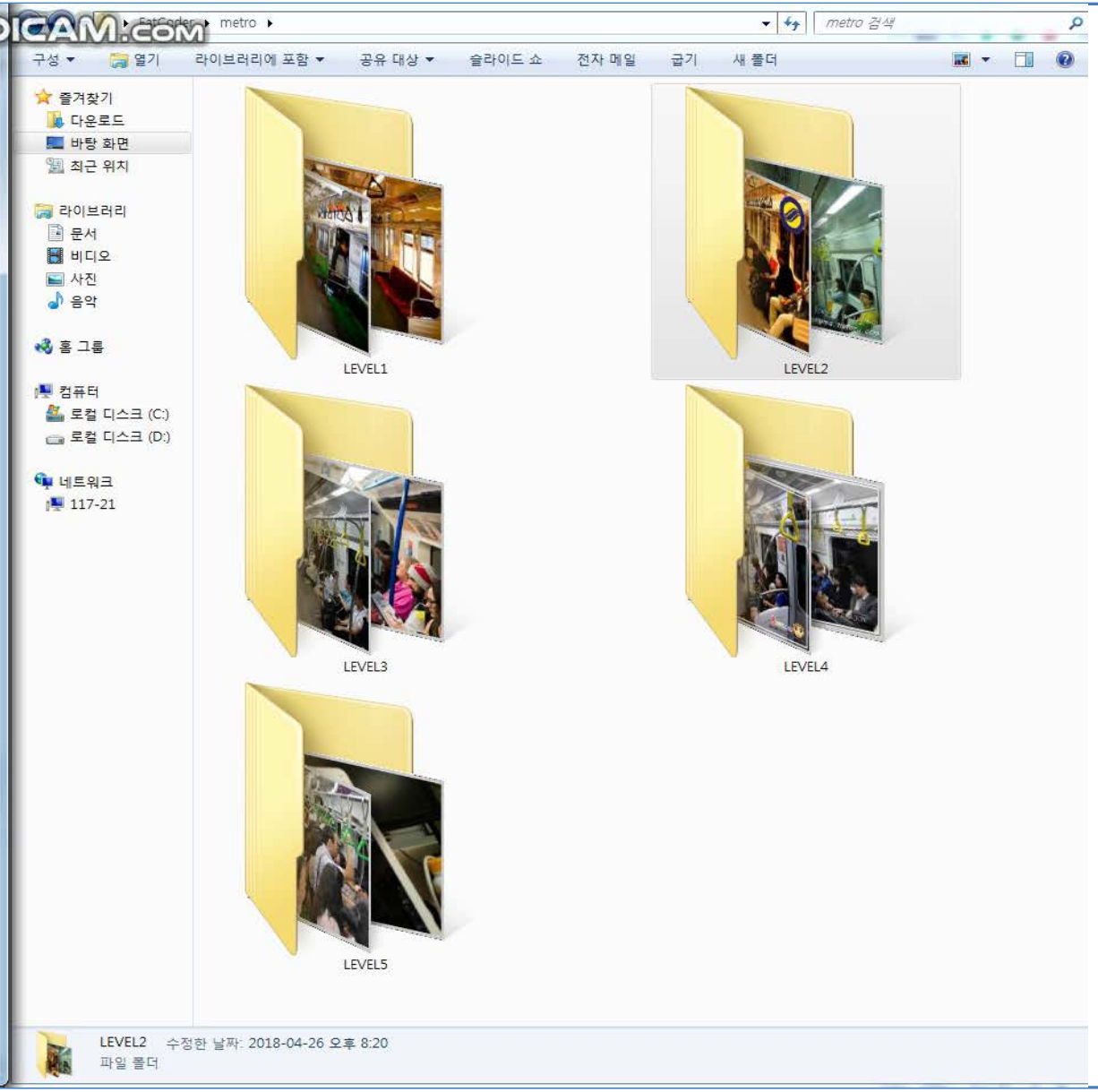


result

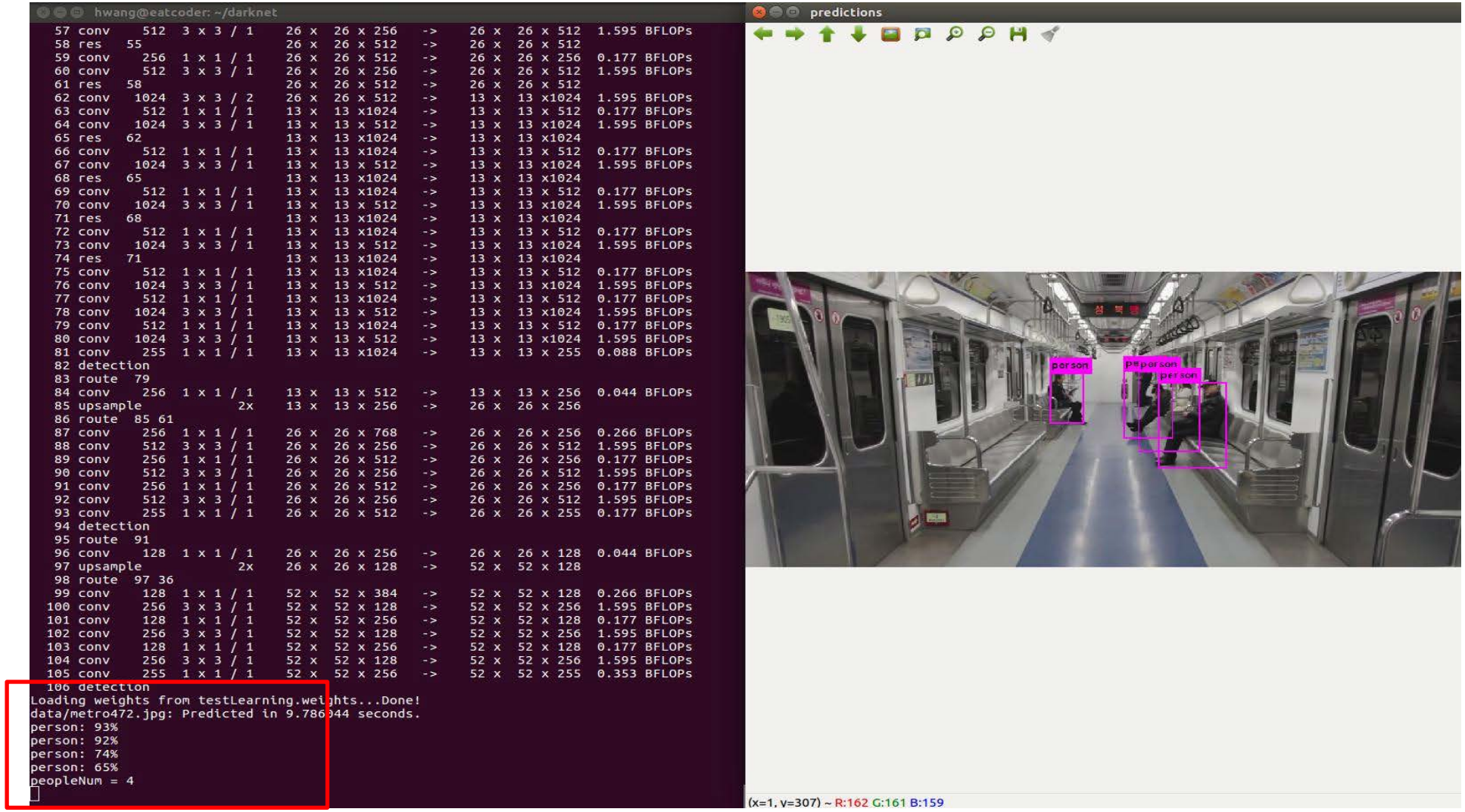
```
persian (score = 0.87143)
ragdoll (score = 0.11378)
chartreux (score = 0.01479)
persian
```

프로젝트 진행상황





프로젝트 진행상황


hwang@eatcoder: ~/darknet
57 conv 512 3 x 3 / 1 26 x 26 x 256 -> 26 x 26 x 512 1.595 BFLOPs
58 res 55 26 x 26 x 512 -> 26 x 26 x 512
59 conv 256 1 x 1 / 1 26 x 26 x 512 -> 26 x 26 x 256 0.177 BFLOPs
60 conv 512 3 x 3 / 1 26 x 26 x 256 -> 26 x 26 x 512 1.595 BFLOPs
61 res 58 26 x 26 x 512 -> 26 x 26 x 512
62 conv 1024 3 x 3 / 2 26 x 26 x 512 -> 13 x 13 x1024 1.595 BFLOPs
63 conv 512 1 x 1 / 1 13 x 13 x1024 -> 13 x 13 x 512 0.177 BFLOPs
64 conv 1024 3 x 3 / 1 13 x 13 x 512 -> 13 x 13 x1024 1.595 BFLOPs
65 res 62 13 x 13 x1024 -> 13 x 13 x1024
66 conv 512 1 x 1 / 1 13 x 13 x1024 -> 13 x 13 x 512 0.177 BFLOPs
67 conv 1024 3 x 3 / 1 13 x 13 x 512 -> 13 x 13 x1024 1.595 BFLOPs
68 res 65 13 x 13 x1024 -> 13 x 13 x1024
69 conv 512 1 x 1 / 1 13 x 13 x1024 -> 13 x 13 x 512 0.177 BFLOPs
70 conv 1024 3 x 3 / 1 13 x 13 x 512 -> 13 x 13 x1024 1.595 BFLOPs
71 res 68 13 x 13 x1024 -> 13 x 13 x1024
72 conv 512 1 x 1 / 1 13 x 13 x1024 -> 13 x 13 x 512 0.177 BFLOPs
73 conv 1024 3 x 3 / 1 13 x 13 x 512 -> 13 x 13 x1024 1.595 BFLOPs
74 res 71 13 x 13 x1024 -> 13 x 13 x1024
75 conv 512 1 x 1 / 1 13 x 13 x1024 -> 13 x 13 x 512 0.177 BFLOPs
76 conv 1024 3 x 3 / 1 13 x 13 x 512 -> 13 x 13 x1024 1.595 BFLOPs
77 conv 512 1 x 1 / 1 13 x 13 x1024 -> 13 x 13 x 512 0.177 BFLOPs
78 conv 1024 3 x 3 / 1 13 x 13 x 512 -> 13 x 13 x1024 1.595 BFLOPs
79 conv 512 1 x 1 / 1 13 x 13 x1024 -> 13 x 13 x 512 0.177 BFLOPs
80 conv 1024 3 x 3 / 1 13 x 13 x 512 -> 13 x 13 x1024 1.595 BFLOPs
81 conv 255 1 x 1 / 1 13 x 13 x1024 -> 13 x 13 x 255 0.088 BFLOPs
82 detection
83 route 79
84 conv 256 1 x 1 / 1 13 x 13 x 512 -> 13 x 13 x 256 0.044 BFLOPs
85 upsample 2x 13 x 13 x 256 -> 26 x 26 x 256
86 route 85 61
87 conv 256 1 x 1 / 1 26 x 26 x 768 -> 26 x 26 x 256 0.266 BFLOPs
88 conv 512 3 x 3 / 1 26 x 26 x 256 -> 26 x 26 x 512 1.595 BFLOPs
89 conv 256 1 x 1 / 1 26 x 26 x 512 -> 26 x 26 x 256 0.177 BFLOPs
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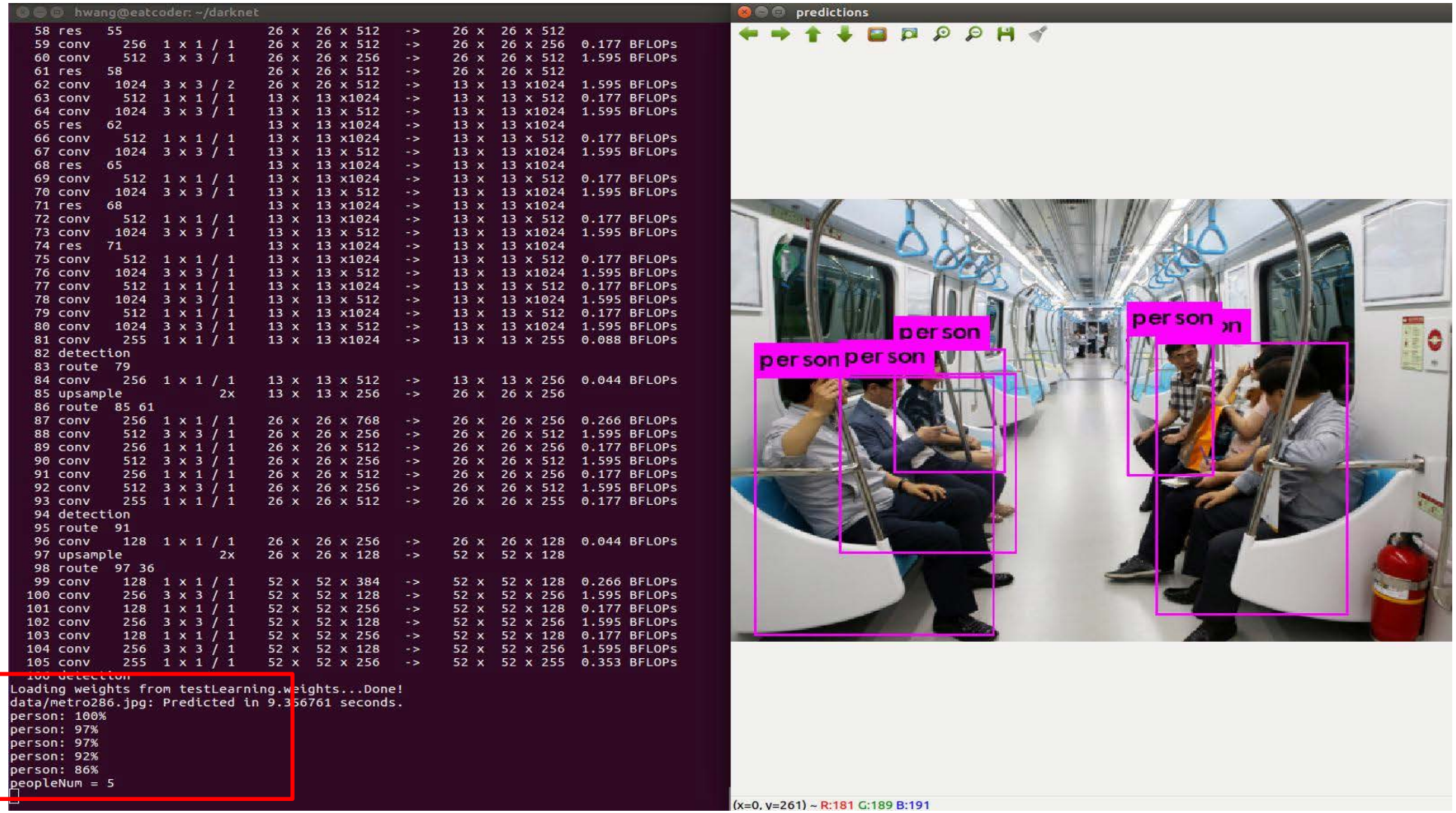
91 conv 256 1 x 1 / 1 26 x 26 x 512 -> 26 x 26 x 256 0.177 BFLOPs
92 conv 512 3 x 3 / 1 26 x 26 x 256 -> 26 x 26 x 512 1.595 BFLOPs
93 conv 255 1 x 1 / 1 26 x 26 x 512 -> 26 x 26 x 255 0.177 BFLOPs
94 detection
95 route 91
96 conv 128 1 x 1 / 1 26 x 26 x 256 -> 26 x 26 x 128 0.044 BFLOPs
97 upsample 2x 26 x 26 x 128 -> 52 x 52 x 128
98 route 97 36
99 conv 128 1 x 1 / 1 52 x 52 x 384 -> 52 x 52 x 128 0.266 BFLOPs
100 conv 256 3 x 3 / 1 52 x 52 x 128 -> 52 x 52 x 256 1.595 BFLOPs
101 conv 128 1 x 1 / 1 52 x 52 x 256 -> 52 x 52 x 128 0.177 BFLOPs
102 conv 256 3 x 3 / 1 52 x 52 x 128 -> 52 x 52 x 256 1.595 BFLOPs
103 conv 128 1 x 1 / 1 52 x 52 x 256 -> 52 x 52 x 128 0.177 BFLOPs
104 conv 256 3 x 3 / 1 52 x 52 x 128 -> 52 x 52 x 256 1.595 BFLOPs
105 conv 255 1 x 1 / 1 52 x 52 x 256 -> 52 x 52 x 255 0.353 BFLOPs
106 detection
Loading weights from testLearning.weights...Done!
data/metro472.jpg: Predicted in 9.786944 seconds.
person: 93%
person: 92%
person: 74%
person: 65%
peopleNum = 4
predictions
person
person
person
(x=1, y=307) ~ R:162 G:161 B:159

프로젝트 진행상황


hwang@eatcoder: ~/darknet
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63 conv 512 1 x 1 / 1 13 x 13 x1024 -> 13 x 13 x 512 0.177 BFLOPs
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70 conv 1024 3 x 3 / 1 13 x 13 x 512 -> 13 x 13 x1024 1.595 BFLOPs
71 res 68 13 x 13 x1024 -> 13 x 13 x1024
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73 conv 1024 3 x 3 / 1 13 x 13 x 512 -> 13 x 13 x1024 1.595 BFLOPs
74 res 71 13 x 13 x1024 -> 13 x 13 x1024
75 conv 512 1 x 1 / 1 13 x 13 x1024 -> 13 x 13 x 512 0.177 BFLOPs
76 conv 1024 3 x 3 / 1 13 x 13 x 512 -> 13 x 13 x1024 1.595 BFLOPs
77 conv 512 1 x 1 / 1 13 x 13 x1024 -> 13 x 13 x 512 0.177 BFLOPs
78 conv 1024 3 x 3 / 1 13 x 13 x 512 -> 13 x 13 x1024 1.595 BFLOPs
79 conv 512 1 x 1 / 1 13 x 13 x1024 -> 13 x 13 x 512 0.177 BFLOPs
80 conv 1024 3 x 3 / 1 13 x 13 x 512 -> 13 x 13 x1024 1.595 BFLOPs
81 conv 255 1 x 1 / 1 13 x 13 x1024 -> 13 x 13 x 255 0.088 BFLOPs
82 detection
83 route 79
84 conv 256 1 x 1 / 1 13 x 13 x 512 -> 13 x 13 x 256 0.044 BFLOPs
85 upsample 2x 13 x 13 x 256 -> 26 x 26 x 256
86 route 85 61
87 conv 256 1 x 1 / 1 26 x 26 x 768 -> 26 x 26 x 256 0.266 BFLOPs
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91 conv 256 1 x 1 / 1 26 x 26 x 512 -> 26 x 26 x 256 0.177 BFLOPs
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93 conv 255 1 x 1 / 1 26 x 26 x 512 -> 26 x 26 x 255 0.177 BFLOPs
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95 route 91
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97 upsample 2x 26 x 26 x 128 -> 52 x 52 x 128
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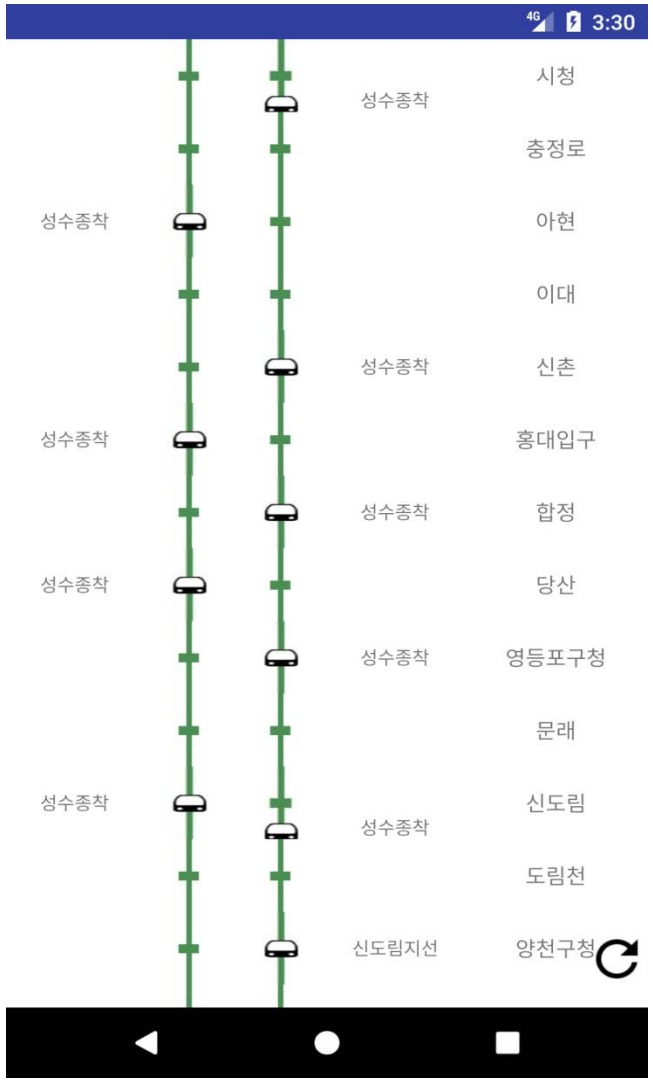
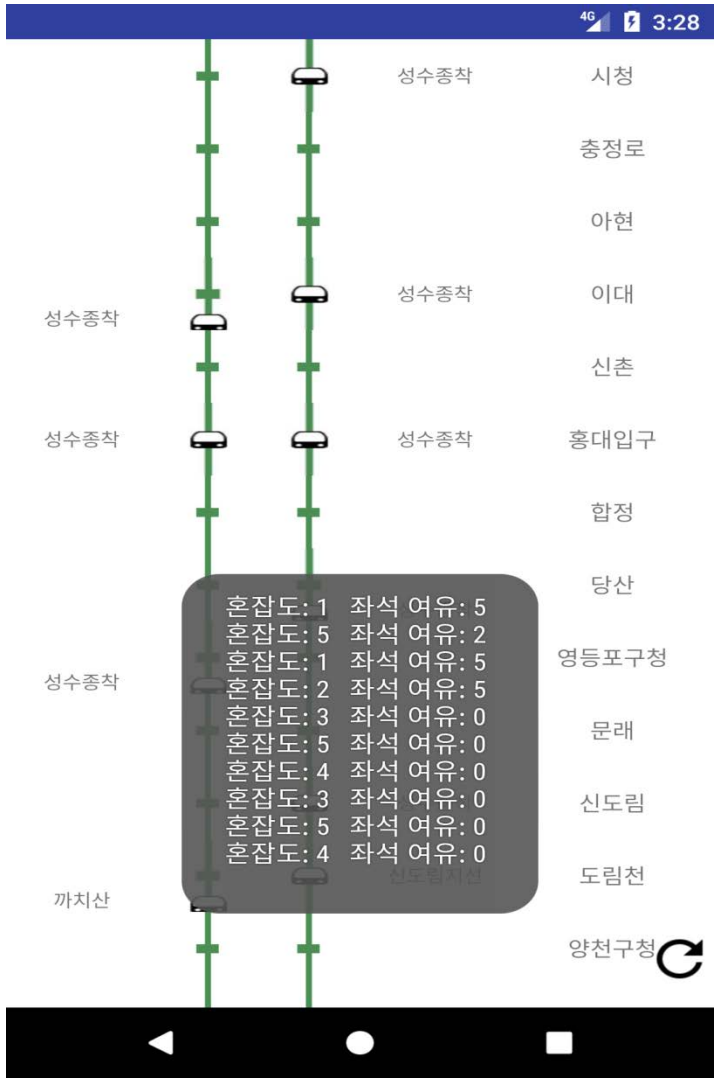
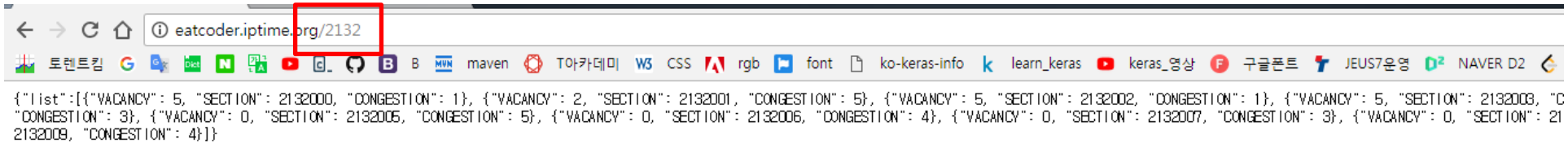
101 conv 128 1 x 1 / 1 52 x 52 x 256 -> 52 x 52 x 128 0.177 BFLOPs
102 conv 256 3 x 3 / 1 52 x 52 x 128 -> 52 x 52 x 256 1.595 BFLOPs
103 conv 128 1 x 1 / 1 52 x 52 x 256 -> 52 x 52 x 128 0.177 BFLOPs
104 conv 256 3 x 3 / 1 52 x 52 x 128 -> 52 x 52 x 256 1.595 BFLOPs
105 conv 255 1 x 1 / 1 52 x 52 x 256 -> 52 x 52 x 255 0.353 BFLOPs
106 detection
Loading weights from testLearning.weights...Done!
data/metro286.jpg: Predicted in 9.356761 seconds.
person: 100%
person: 97%
person: 97%
person: 92%
person: 86%
peopleNum = 5
predictions
person
person person
person
(x=0, y=261) ~ R:181 G:189 B:191

프로젝트 진행상황(Client)

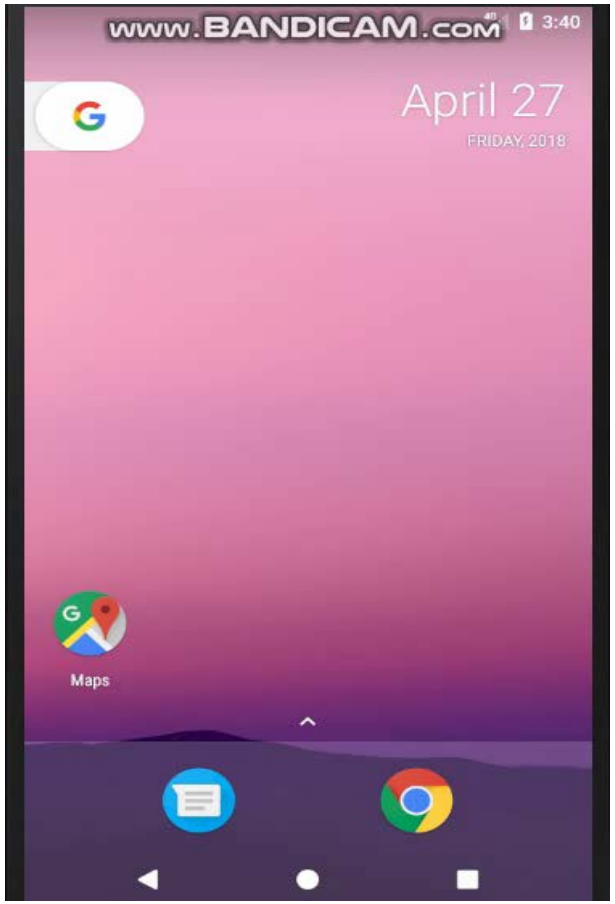




프로젝트 진행상황



{"list":[{"VACANCY": 5, "SECTION": 2132000, "CONGESTION": 1}, {"VACANCY": 2, "SECTION": 2132001, "CONGESTION": 5}, {"VACANCY": 5, "SECTION": 2132002, "CONGESTION": 1}, {"VACANCY": 5, "SECTION": 2132003, "C
"CONGESTION": 3}, {"VACANCY": 0, "SECTION": 2132005, "CONGESTION": 5}, {"VACANCY": 0, "SECTION": 2132006, "CONGESTION": 4}, {"VACANCY": 0, "SECTION": 2132007, "CONGESTION": 3}, {"VACANCY": 0, "SECTION": 21
2132009, "CONGESTION": 4}]}




Q&A