TEAM

THE OUTSIDERS

"Capstone Project_Idea Proposal"

Agenda

00. Team Introduction

01. Project Topic

02. Project Objective

03. Background & Related work

04. Proposed Solution

05. Role & Plan

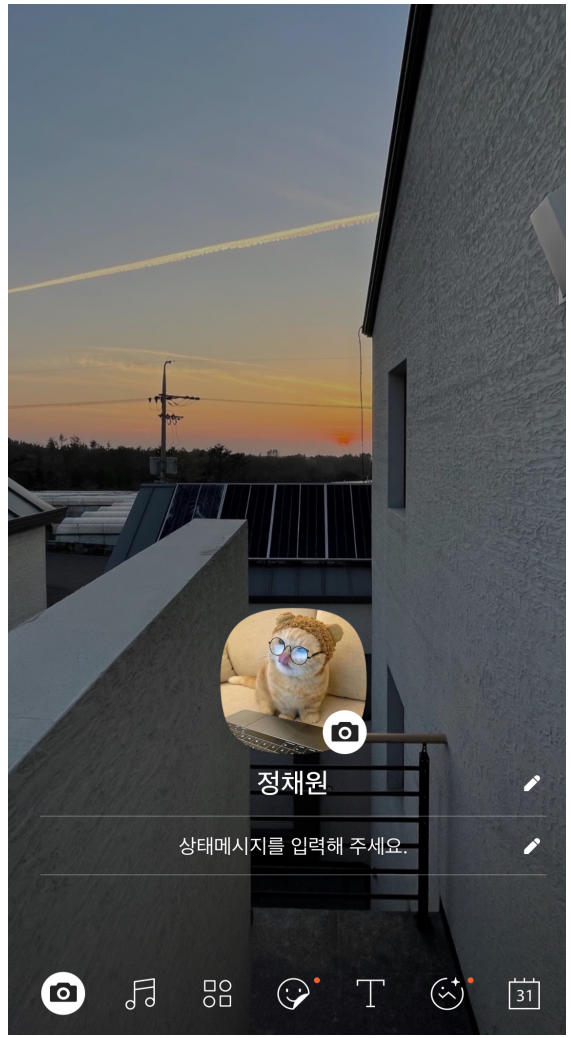
00. Team Introduction

THE OUTSIDERS

"5 Different Majors"

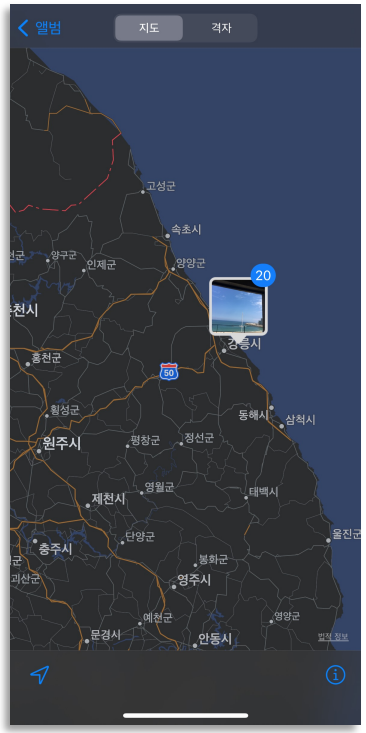
01. Project Topic

How to find the accurate location?



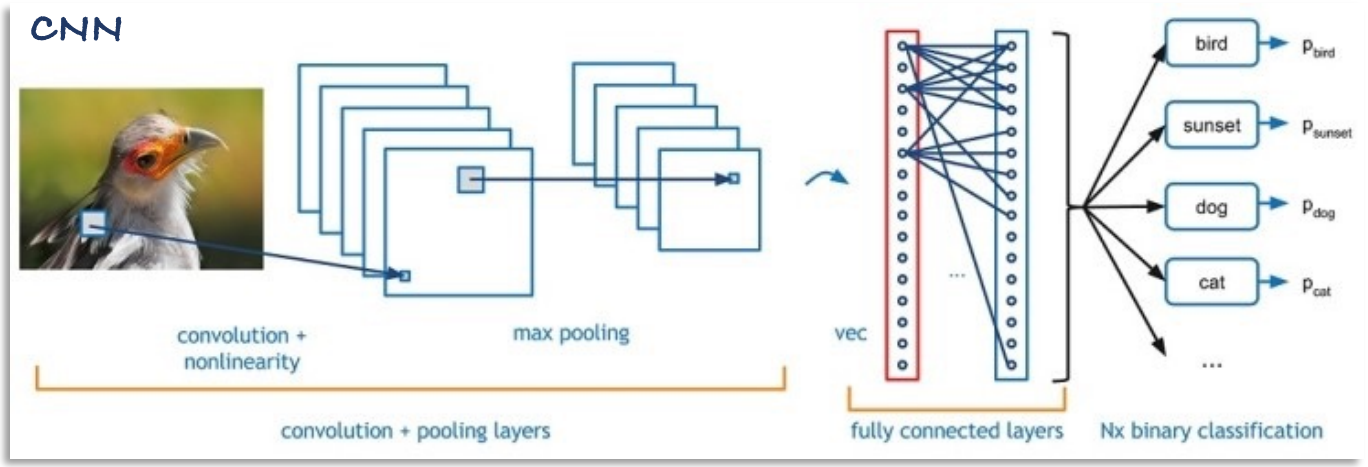
How to find the location?

(1) Use Location Tag



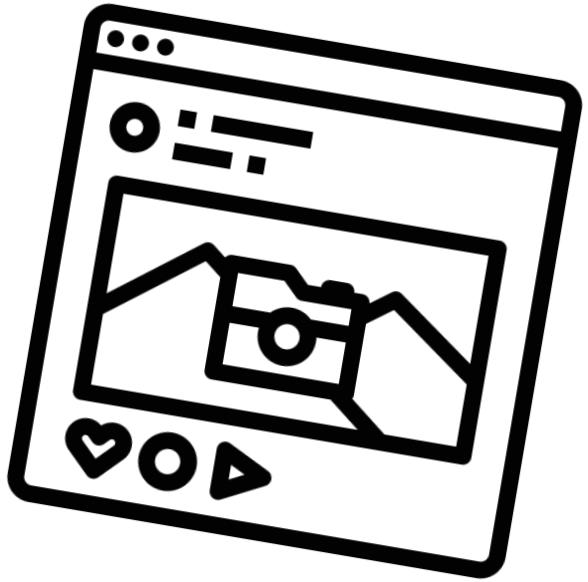
(2) Use Image Search
(like google Image Search)

02. Project Objective



"CNN based location image search and its adaptation to social network"

“Differentiation of our project”

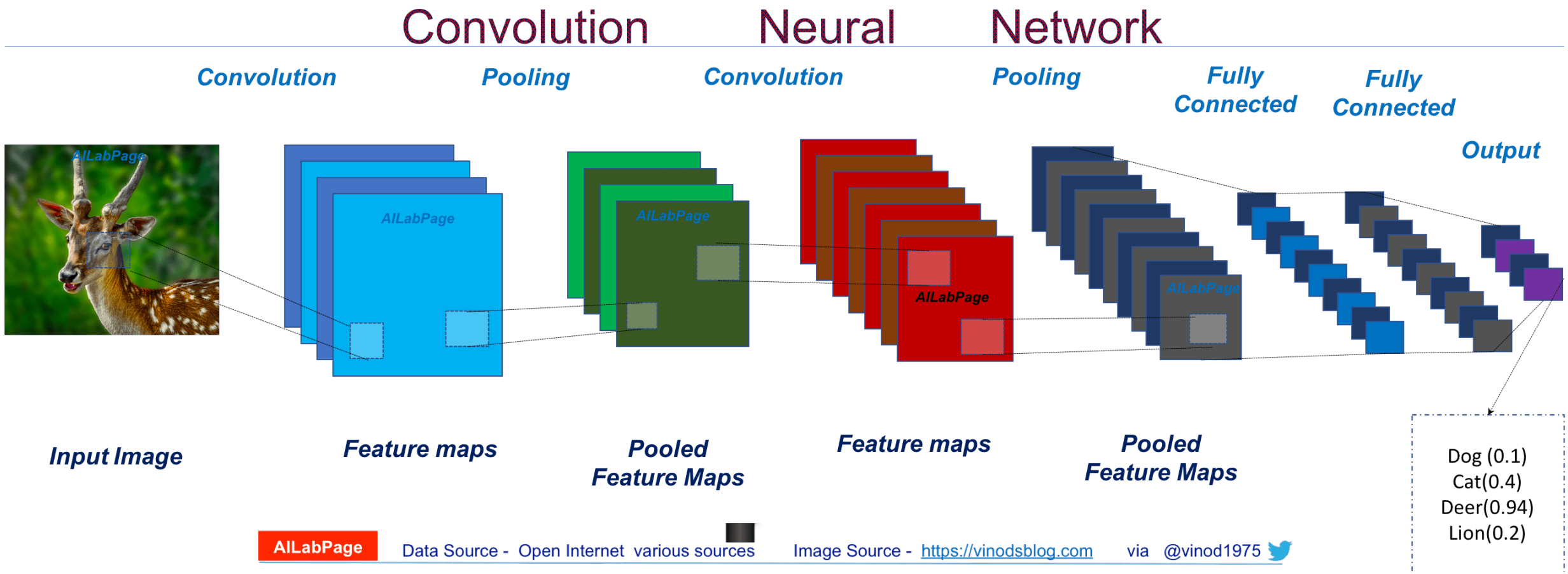


CNN based place recognition in seoul

Add “posting function” like sns style

Merits in commercial or tourism industry in that region

Background


Convolution Neural Network
Convolution
Pooling
Convolution
Pooling
Fully Connected
Fully Connected
Output
AILabPage
Input Image
Feature maps
Pooled Feature Maps
Feature maps
Pooled Feature Maps
Dog (0.1)
Cat(0.4)
Deer(0.94)
Lion(0.2)
AILabPage
Data Source - Open Internet various sources
Image Source - https://vinodsblog.com
via @vinod1975

Related work

Introduction of References

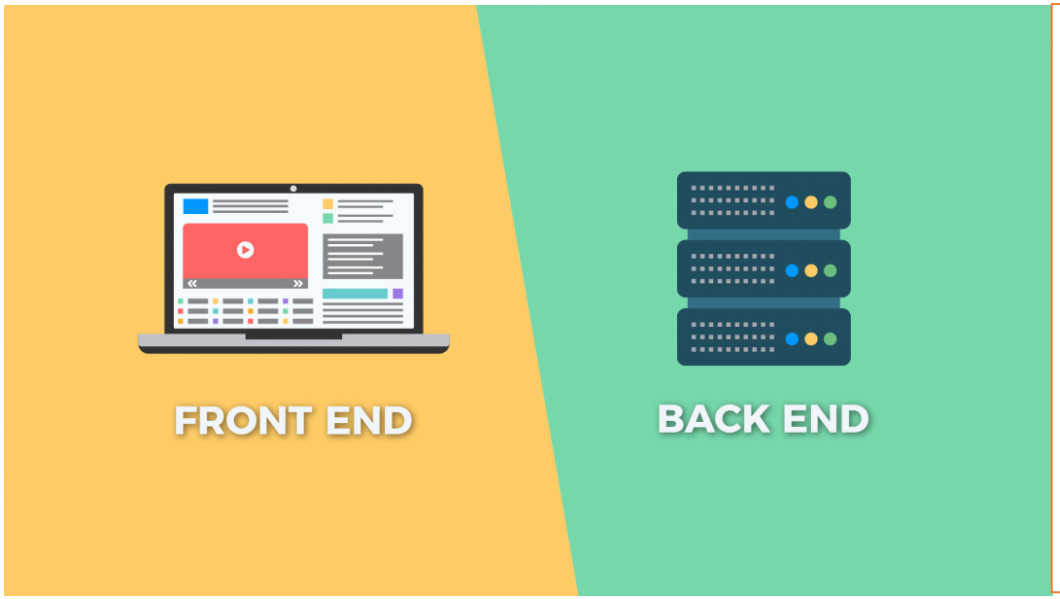
A. Not CNN : Use binary feature detectors and descriptors

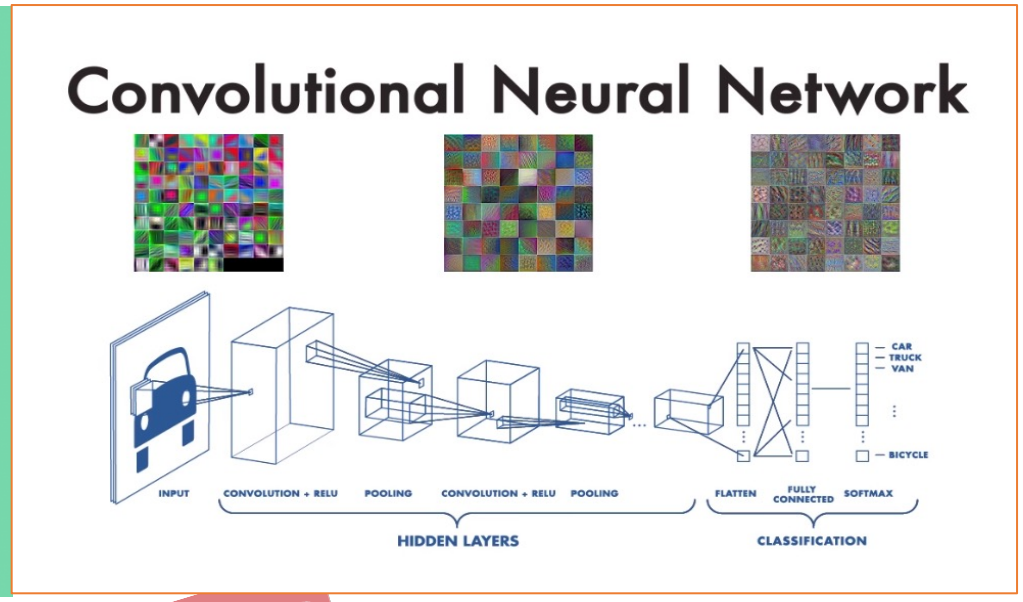
B. CNN : Rusia's Tourlism Application (use VGG16, GoogLeNet, MobileNetV2)

C. CNN : Reasearch about Seoul's Landmark (use CNN Resnet101)

"CNN based location image search and its adaptation to social network"

04. Proposed Solution





- Front End
- CNN Build
- Back End

front end

PINPLACE

: CNN based location image search & its adaptation to social network

Functions

a. Find place's location (embedded CNN)

b. List up Hot place (w/ Sorting algorithm)

c. Uploading data that users have

d. SNS (w/ Recommendation algorithm)

Tools

Overleaf colab

Stacks

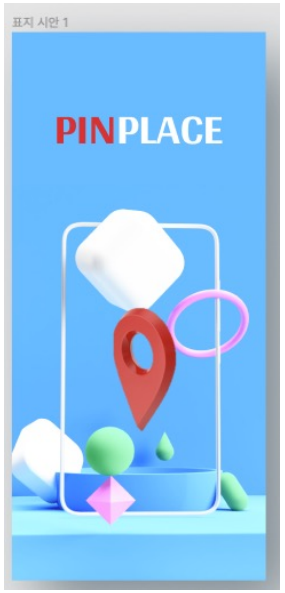
HTML CSS JS Bootstrap MySQL node TensorFlow.js

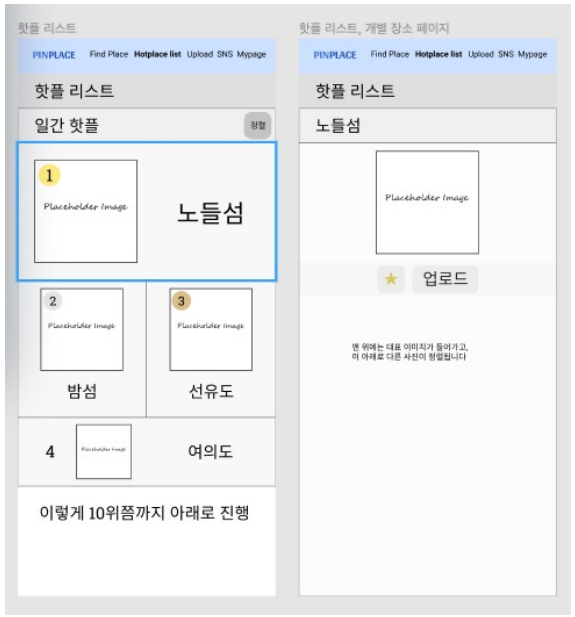
04. Proposed Solution

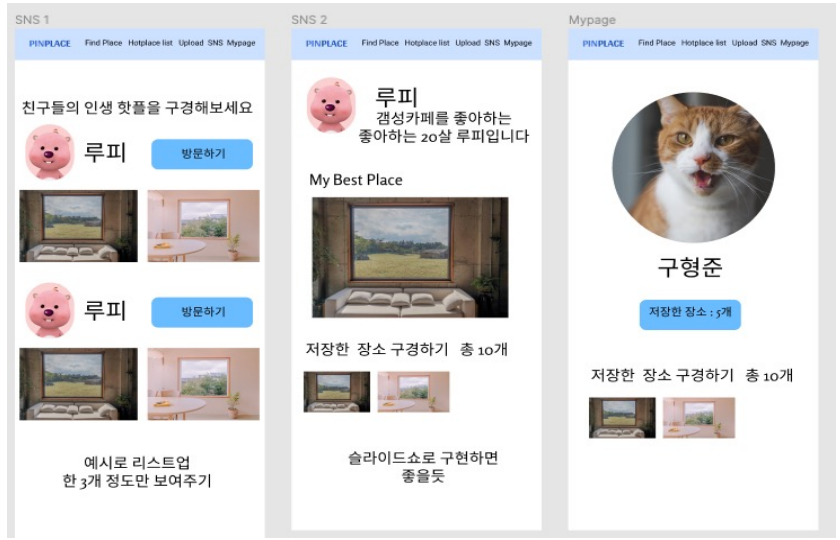
front end

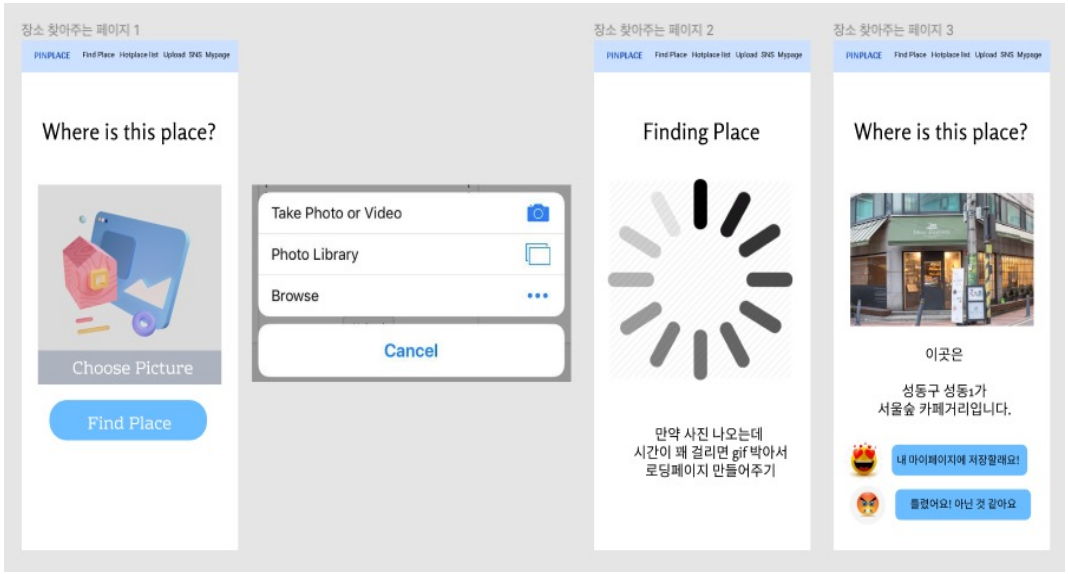
UI Design

~ing









04. Proposed Solution

CNN Build

Obtaining Location Information

Google kaggle Instagram

#How to develop?

Building CNN Model

TensorFlow

Keras

Making Web-based Application

04. Proposed Solution

CNN Build

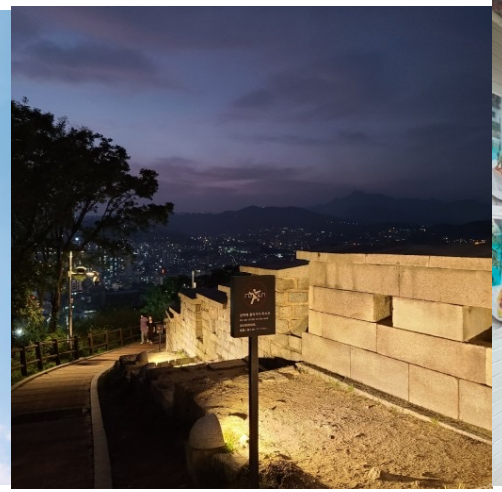
Image dataset

Choose 10 hot places in Seoul where MZ generation likes

The hyundai seoul mall

Jamsil lotte tower

Naksan park



N seoul tower

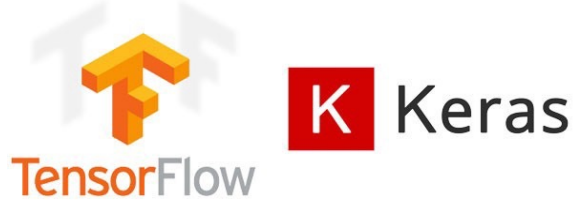
Ickseon hanok vilage

CNN Build

Obtaining Location image data

- Collect image data by crawling

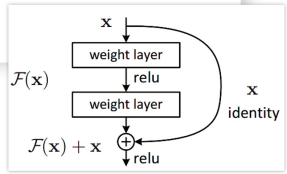
- Remove noise and duplicate data



CNN Model

Famous CNN Architecture : ResNet

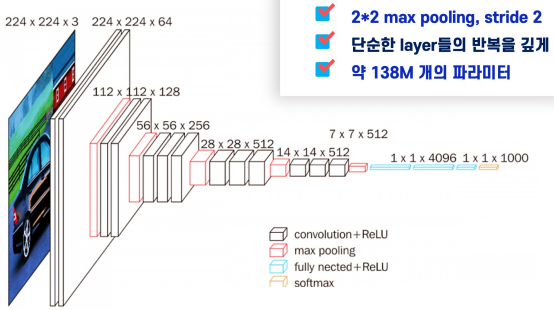
- ILSVRC 2015 우승
- Residual block 활용 : 잔차를 활용하는 network (skip connection)
- Fully-connected layer를 사용하지 않음
- ResNet-34, ResNet-152 등이 널리 사용



ResNet

Famous CNN Architecture: VGG-16

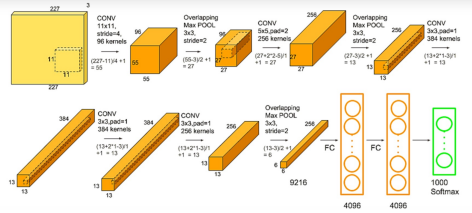
- ILSVRC 2014 준우승
- 3*3 convolution kernel, stride 1, SAME padding
- 2*2 max pooling, stride 2
- 단순한 layer들의 반복을 깊게 쌓아 좋은 성능을 보임
- 약 138M 개의 파라미터



VGG-16

Famous CNN Architecture: AlexNet

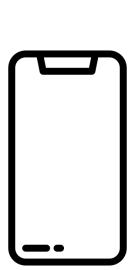
- ImageNet ILSVRC challenge 2012년 우승
  - Image를 1000개의 class로 분류 (Top-5 accuarcy)
- Data cropping 및 flipping을 통한 data augmentation
- ReLU activation function 사용
- 5 convolutions, 3 overlapping max-poolings, 3 fully-connected layers
- 약 61M 개의 parameter



AlexNet

04. Proposed Solution

Back end



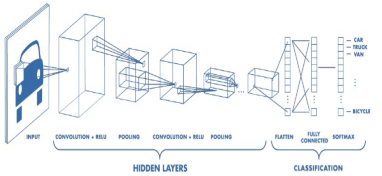
front end

Send
Result To
web app

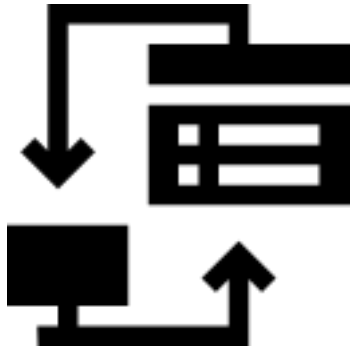
Save data
To DB

back end

Convert
.h5 file to .json file



cnn build



Role distribution

LEE JI SEOP : web programing in hot place list pages and pages about collecting images from users.

JEONG CHAEWON making UI and web programing in main pages, CNN implementation pages and posting pages.

UHM JI YONG : backend such as establishing DB and server, connecting CNN models into web app.

CHE SEUNG YUN : image pretreatment, building CNN models and test them and comparing performance.

HONG SEONG JUN : collecting images from google and Instagram by crawling and then searching CNN models and helping CNN building.

plan

1. Service Planning & Development Planning (~9/20)
2. UI/UX Design & Graphic Design (~9/27)
3. Collecting Proper image Data set & Building CNN Model (~10/11)
4. Making Web-based application (~11/8)
5. Integrating Code & Backend Working (~11/22)
6. QA Test & Deploy (~12/6)

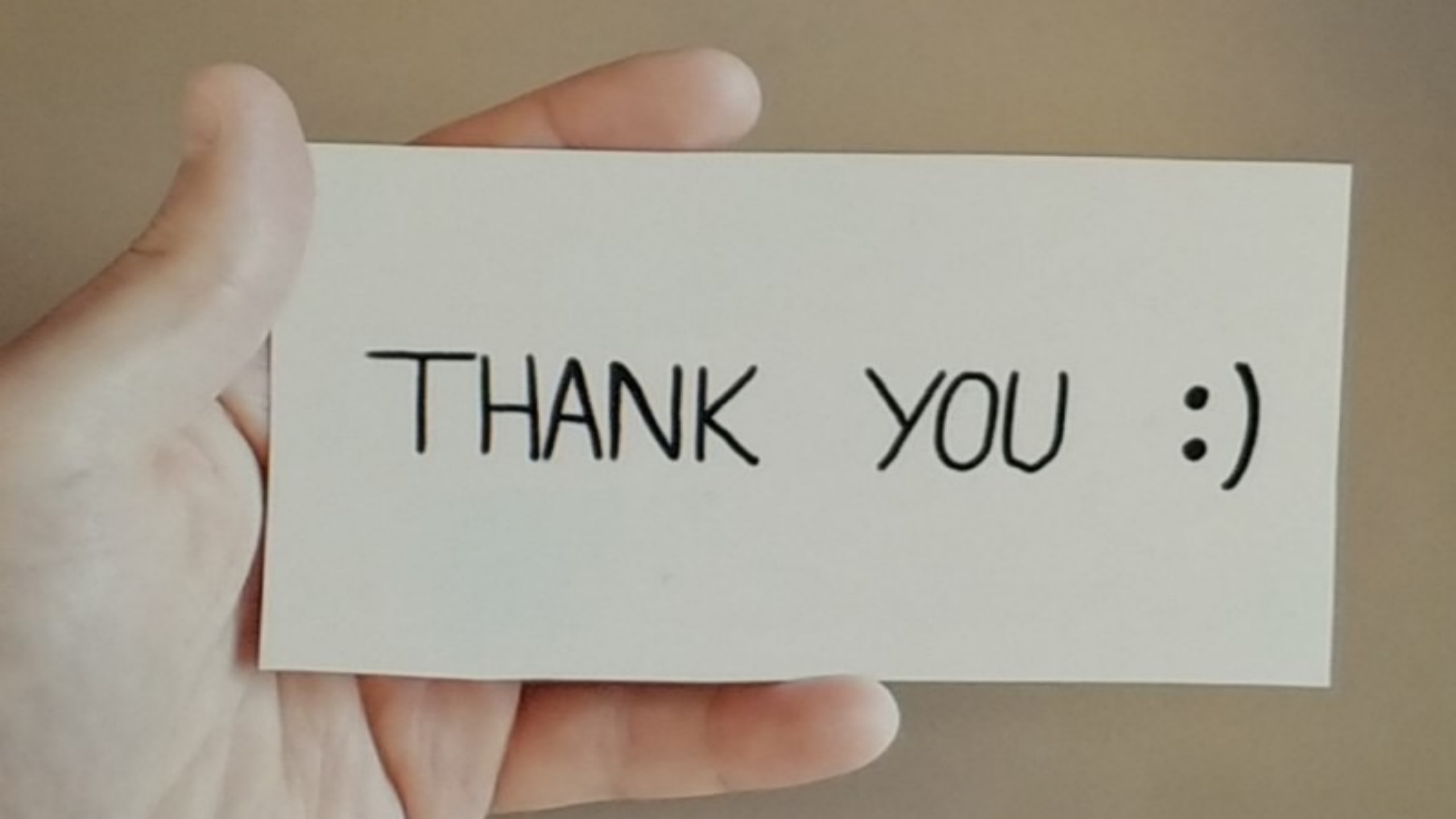
Reference

- 2020 20th International Conference on Control, Automation and Systems (ICCAS 2020) Oct. 13~16, 2020; BEXCO, Busan, Korea

- O. S. Laptev and I. I. Bikmullina, "Sightseeing Application Based on Location Marking and Convolutional Neural Network Building Recognition," *2020 International Russian Automation Conference (RusAutoCon)*, 2020, pp. 209-214, doi: 10.1109/RusAutoCon49822.2020.9208062.

- Journal of The Korea Society of Computer and Information Vol. 25 No. 9, pp. 31-36, September 2020

- 이윤아, 낭종호 (2018). 서울 랜드마크 인식을 위한 학습 이미지 데이터셋 구축 및 CNN을 이용한 인식 실험. 한국정보과학회 학술 발표논문집, 845-847


THANK YOU :)