



TEAM

THE OUTSIDERS

"Capstone Project_Idea Proposal"

WORLD



Agenda

- 00. Team Introduction**
- 01. Project Topic**
- 02. Project Objective**
- 03. Background & Related work**
- 04. Proposed Solution**
- 05. Role & Plan**

THE OUTSIDERS

Mechanical
Engineering

LEE JI SEOP

Mechanical
Engineering

UHM JI YONG

Political Science
& Diplomacy

CHE SEUNG YUN

Business
Administration

JEONG CHAEWON

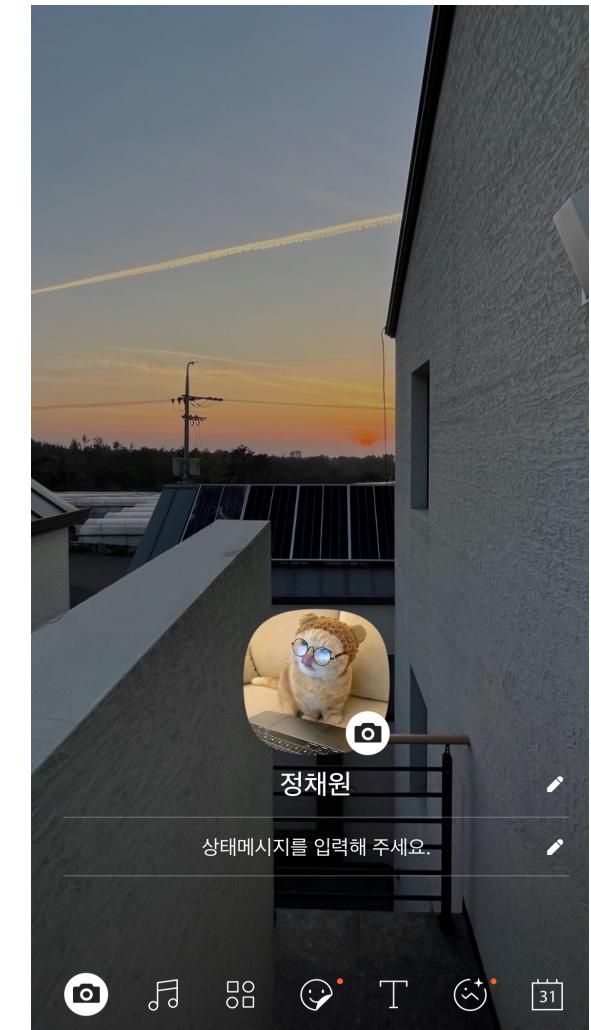
System Management
Engineering

HONG SEONGJUN



"5 Different Majors"

01. Project Topic



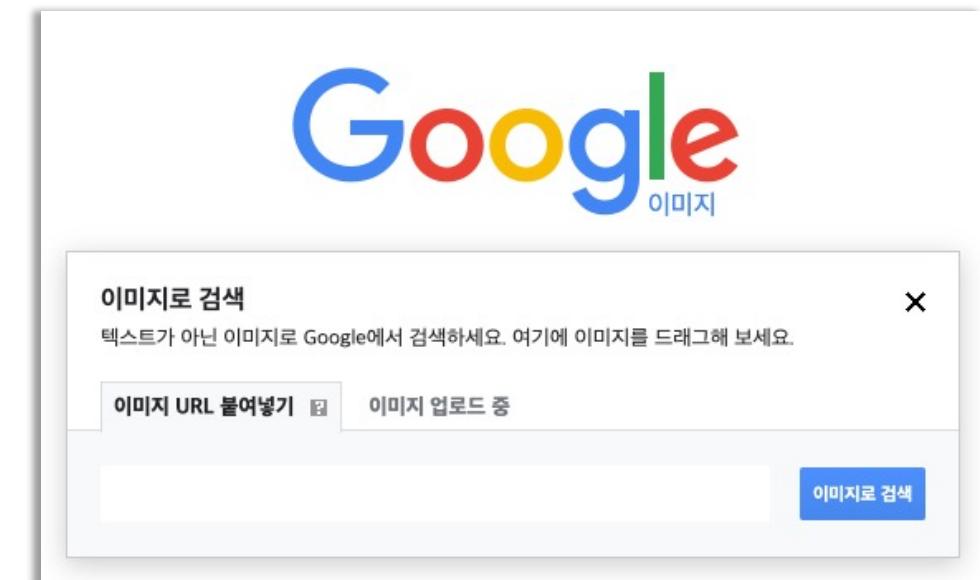


How to find the location?

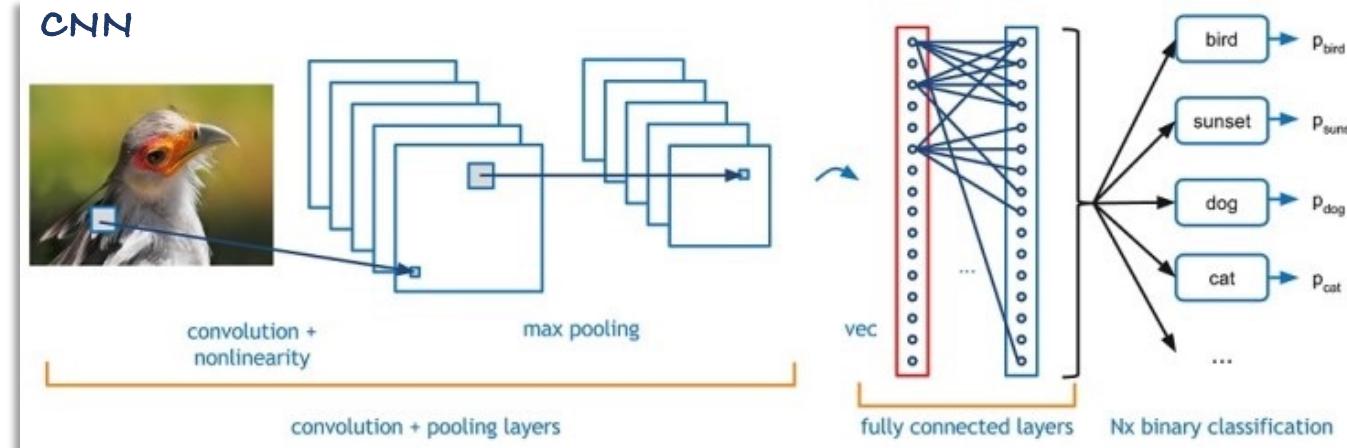
(1) Use Location Tag



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



02. Project Objective



“CNN based location image search and its adaptation to social network”

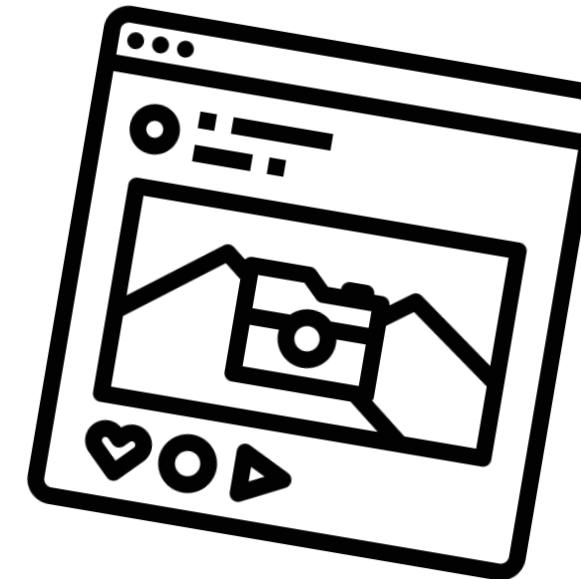


02. Project Objective

“Differentiation of our project”

CNN based place recognition in seoul

Add “posting function” like sns style

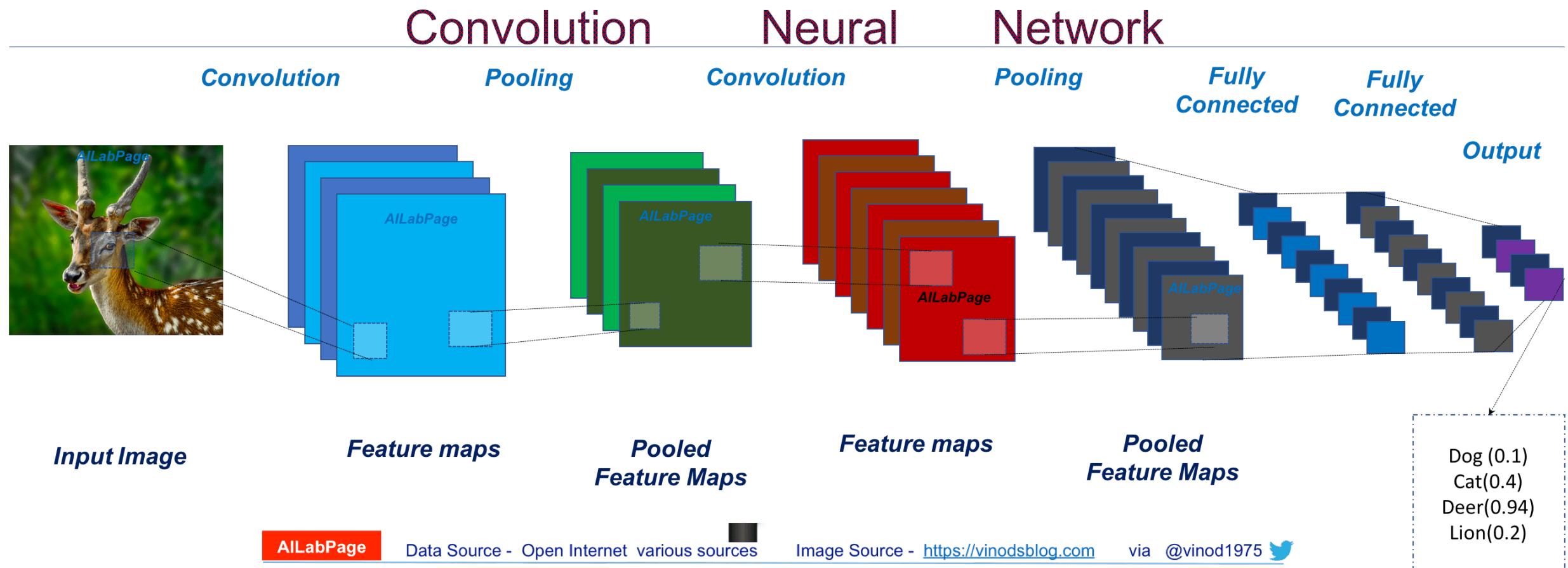


Merits in commercial or tourism
industry in that region



03. Background & Related Work

Background



03. Background & Related Work

Related work

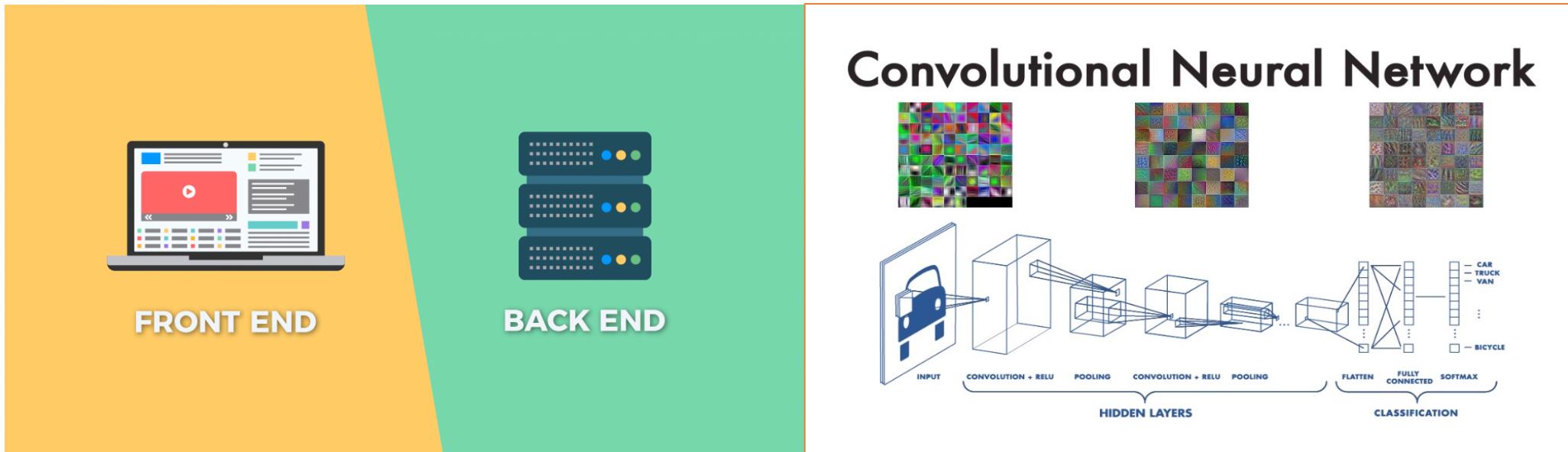


Introduction of References

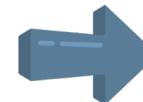
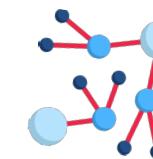
- A. Not CNN : Use binary feature detectors and descriptors
- B. CNN : Rusia's Tourism Application (use VGG16, GoogLeNet, MobileNetV2)
- C. CNN : Research about Seoul's Landmark (use CNN Resnet101)

**“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

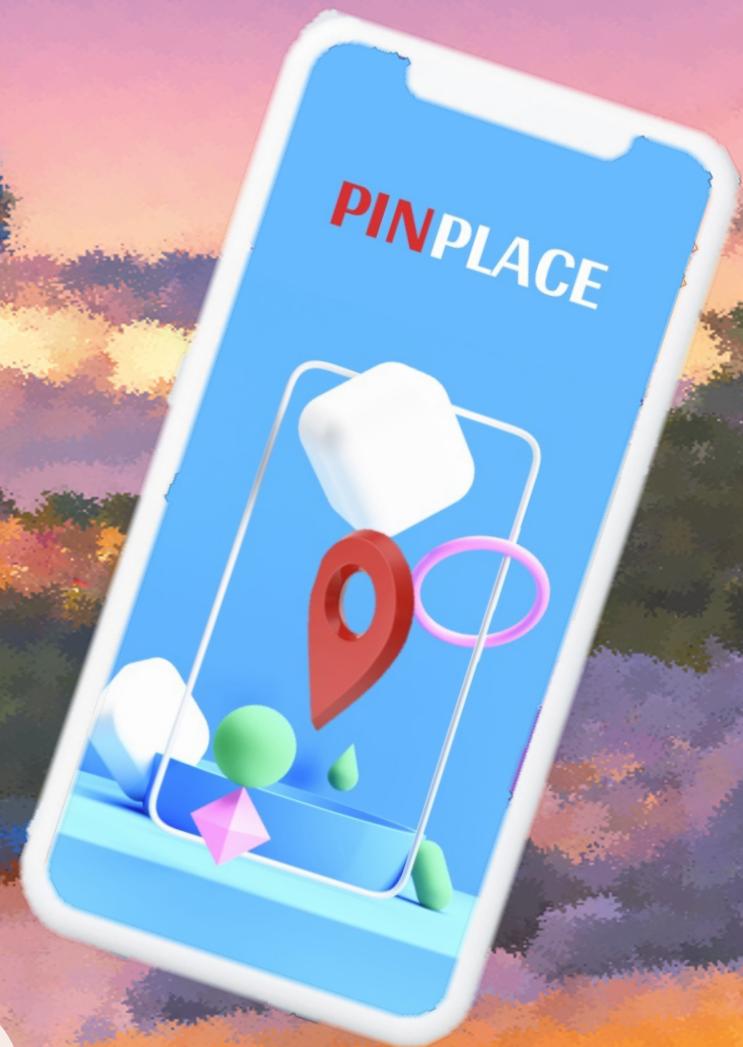


colab

Stacks



MySQL®

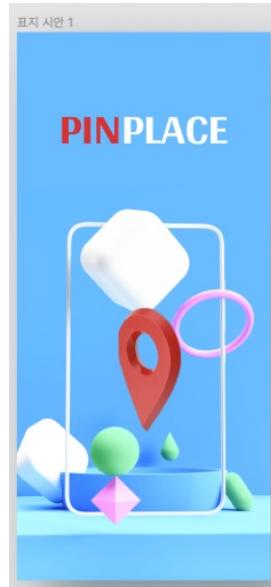


04. Proposed Solution

front end

UI Design

~ing



표지 시안 1

PINPLACE Find Place Hotplace list Upload SNS Mypage

핫플 리스트

일간 핫플

1 Placeholder Image 노들섬

2 Placeholder Image 밤섬

3 Placeholder Image 선유도

4 Placeholder Image 여의도

이렇게 10위쯤까지 아래로 진행

Placeholder Image 업로드

엔 위에는 대표 이미지가 들어가고, 미 아래는 다른 사진이 첨부됩니다.

SNS 1

SNS 2

Mypage

PINPLACE Find Place Hotplace list Upload SNS Mypage

친구들의 인생 핫플을 구경해보세요

루피 방문하기

루피 방문하기

예시로 리스트업 한 3개 정도만 보여주기

루피 방문하기

루피 방문하기

루피 방문하기

My Best Place

저장한 장소 구경하기 총 10개

저장한 장소 구경하기 총 10개

구형준

저장한 장소 : 5개

저장한 장소 구경하기 총 10개

장소 찾아주는 페이지 1

PINPLACE Find Place Hotplace list Upload SNS Mypage

Where is this place?

Choose Picture

Find Place

장소 찾아주는 페이지 2

PINPLACE Find Place Hotplace list Upload SNS Mypage

Take Photo or Video

Photo Library

Browse

Cancel

Finding Place

만약 사진 나오는데 시간이 꽤 걸리면 gif 밖에서 로딩페이지 만들어주기

장소 찾아주는 페이지 3

PINPLACE Find Place Hotplace list Upload SNS Mypage

Where is this place?

이곳은

성동구 성동1가 서울숲 카페거리입니다.

내 마이페이지에 저장할래요!

풀렸어요! 아닌 것 같아요

업로드

PINPLACE Find Place Hotplace list Upload SNS Mypage

기억해줘요

대_

대명거리

대학로

사진을 먼저 올릴래요

사진을 올려주세요

사진을 올리면 미리보기를 표출할 것

여기는 어디인가요?

(지도가 들어갈 공간 - OpenLayers?)
(사진의 EXIF 데이터에 좌표 정보가 있으면)
(그것을 우선 적용)
(전 단계에서 장소를 선택해 와도)
(그 대학적인 위치를 우선 적용)

업로드, 사진 업로드

PINPLACE Find Place Hotplace list Upload SNS Mypage

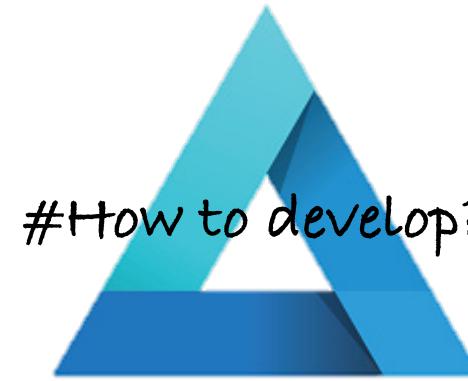
기억해줘요

OK

04. Proposed Solution

CNN Build

Obtaining Location Information



Building CNN Model



Making Web-based Application



04. Proposed Solution

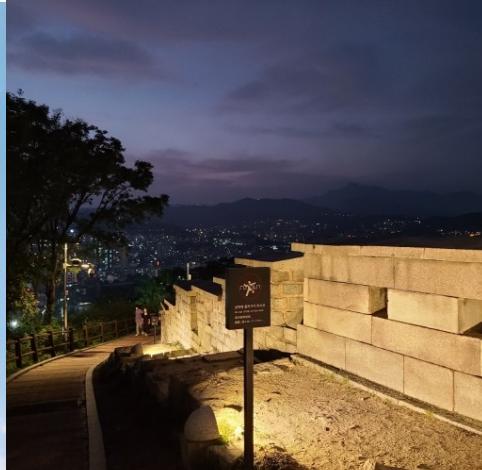
CNN Build

Image dataset

>> Choose 10 hot places in Seoul
where MZ generation likes



N seoul tower ↗



Naksan park ↗



ickseon
hanok vilage ↗



The hyundai seoul mall ↗



Jamsil lotte tower ↗

04. Proposed Solution

CNN Build

Obtaining Location image data

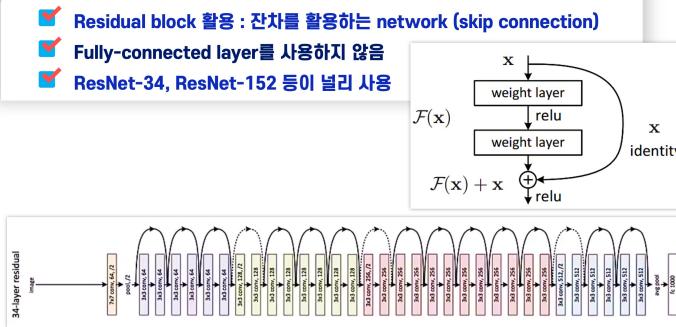
- ▶ Collect image data by crawling 
 - ▶ Remove noise and duplicate data



CNN Model

Famous CNN Architecture : ResNet

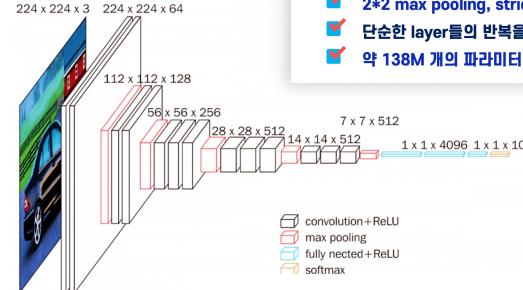
- ILSVRC 2015 우승
 - Residual block 활용 : 잔차를 활용하는 network (skip connection)
 - Fully-connected layer를 사용하지 않음
 - ResNet-34, ResNet-152 등이 널리 사용



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

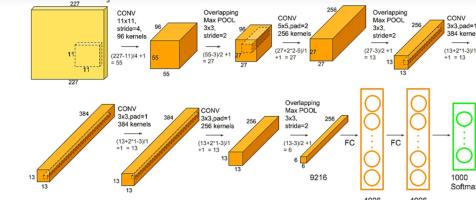


VGG-16



Famous CNN Architecture: AlexNet

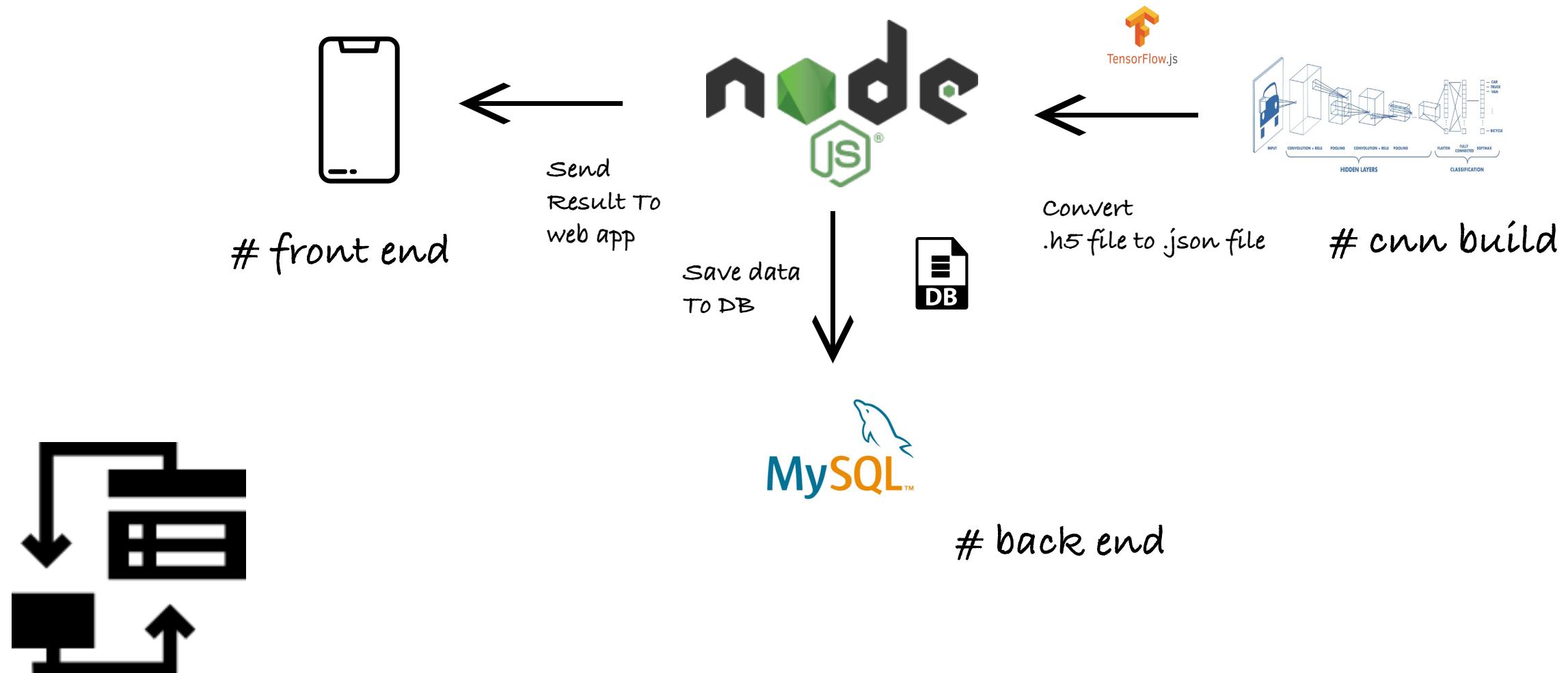
- ImageNet ILSVRC challenge 2012년 우승
 - Image를 1000개의 class로 분류 (Top-5 accuracy)
 - ✓ Data cropping 및 flipping을 통한 data augmentation
 - ✓ ReLU activation function 사용
 - ✓ 5 convolutions, 3 overlapping max-poolings, 3 fully-connected layers
 - ✓ 약 61M 개의 parameter



AlexNet

04. Proposed Solution

Back end



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 :)