Team Project Proposal

Unlabeled Food Image based
Nearby Restaurant Recommendation System

Team 4

Contents

Team Introduction

Team Members

- 2277007 Sujin Kim
- 2277018 Seoyeon Ye
- 2277021 Yoojin Oh
- 2277031 Ahyun Ji

Task Assignment

- Ideation, Data collection, Preprocessing, Modeling
  ⇒ All members!

Topic & Problem Statement

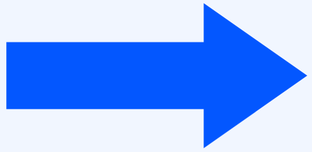
Our Topic

Unlabeled Food Image based
Nearby Restaurant Recommendation System

Problem Statement

Assume that...

- You have a food image without knowing its name
- You want to find nearby restaurants for it



Therefore, we propose a **website** that can **analyze the given image to identify the name or type of food and recommend nearby restaurants** that serve that food.

About the Data

Crawling Naver Place Restaurants

1) Enter Yangjae Station, Gangnam Station, and Samseong Station in Naver Map and search for nearby restaurants.
2) Crawl the restaurant names, telephone numbers, addresses, ratings, menu names, and food photos for the menu.

AIHub Food Image and Nutrition Text

1) More than 400 classes with over 2000 images each, all with a resolution of at least 5 million pixels, totaling 842,000 images
2) Food names are already labeled.

Strategy

01 Brief Summary

02 Data Preprocessing

03 Model Introduction

04 Experimental Scenario

Brief Summary

01

The user captures an image of the specific food and inputs it with the nearest subway station name.

02

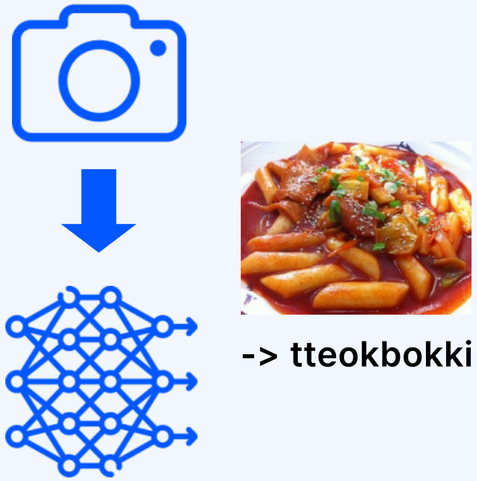
Using a CNN-based model constructed with a training dataset, derive the food label as an output from the received food image.

03

Search for restaurants in the crawled data that have the identified food label(output).

04

Display information about the discovered restaurants to the user.



Data Preprocessing

- Normalize and resize images.
- After, data augmentation will be done in order to avoid overfitting.
  - This is **only for Naver Place dataset** as AIHub dataset is quite huge.

Normalization
Resizing

Data Augmentation

Rotation, Shifting,
Horizontal Flipping, etc

Model Introduction

Specifically, we're going to use **4 popular CNN based models** which are pretrained on the ImageNet, **VGG16, ResNet50, InceptionV3, and DenseNet.**

VGG16

Known for low accuracy or slow training, but use as it is simple and classic model.

ResNet50

Famous, it's skip-connection allows to boost the accuracy of the classification.

InceptionV3

Allows to train both global and local information.

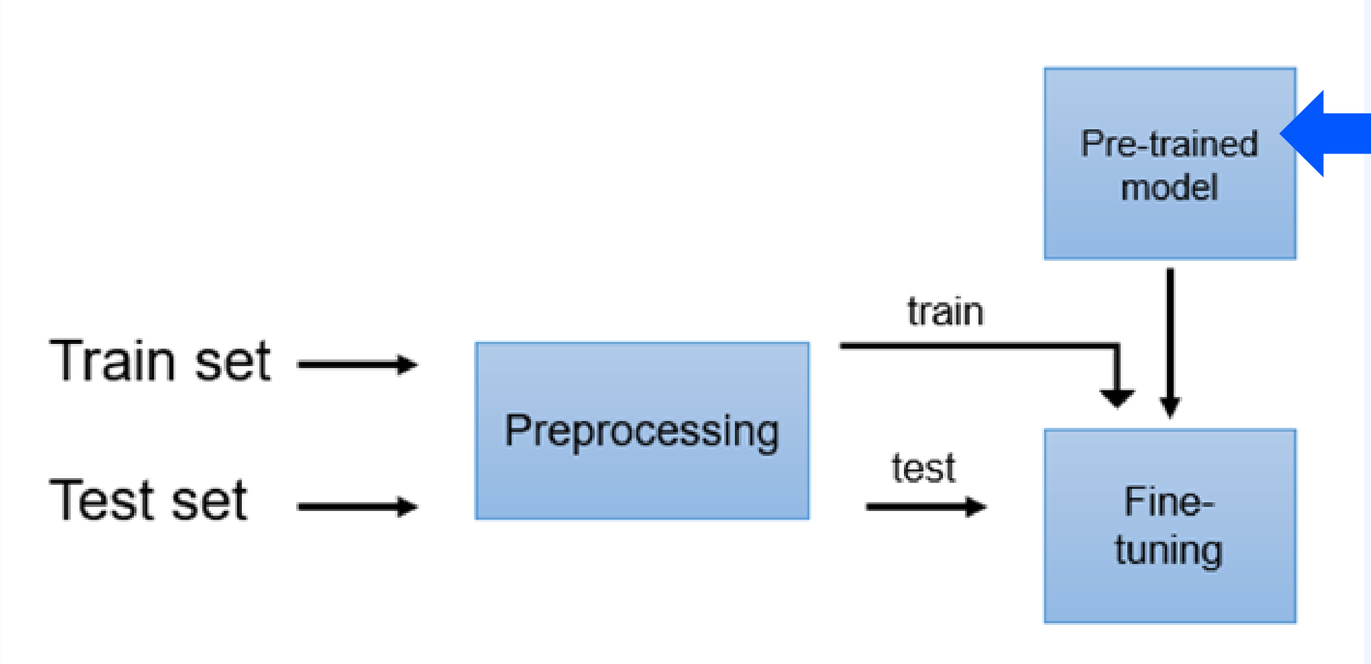
DenseNet

CNN Model after ResNet, good information flow, and got good performance in other image classification projects.

Ensemble on some of these models

Experimental Scenario (Pipeline)

Implement Transfer Learning



Get pre-trained (CNN) models from Keras library

- After classifying, simple **Content-Based Recommendation** will be done to find the restaurant that has short distance and high stars of the corresponding foods based on output of the model.
  - In this case, similarity matrices could be used.

Thank you

Team 4