



Classifying Indian Dishes Using Deep Learning



Hope Tsai and An Nguyen



Motivation

If you had no information on the name of an unfamiliar dish and didn't know its ingredients, how would you research it?



Data

- “Indian Food Images Dataset” (Sourav Banerjee, Kaggle)
 - Usability: 10.00
 - 4000 images
 - 80 classes
- “The-massive-Indian-Food-Dataset” (Anshul Mehta, Kaggle)
 - Usability: 8.75
 - 4770 images
 - 15 classes

Models and Evaluation Methods

- 1st Experiment
 - GlobalAveragePooling2D layer, Dense layers
 - Ran on a random model and a pre-trained model (Inception)
- 2nd Experiment
 - Added Conv2D, BatchNormalization, and MaxPooling2D layers to layer composition
 - Ran on a random model and a pre-trained model (Xception)
- Evaluation Methods (sk.learn)
 - Confusion matrix
 - Classification report (precision, recall, f1 score)

Results

Experiment 1 - categorical accuracies

- pre-trained model
 - first dataset: 0.25
 - second dataset: 0.78
 - combined dataset: 0.33
- random model
 - first dataset: 0.0056
 - second dataset: 0.20
 - combined dataset: 0.11

Experiment 2 - categorical accuracies

- pre-trained model
 - first dataset: 0.30
 - second dataset: 0.81
 - combined dataset: 0.56
- random model
 - first dataset: 0.58
 - second dataset: 0.50
 - combined dataset: 0.29

Discussion

- The pretrained model performs better than the random model
- The second dataset had the highest accuracy out of the three datasets
- Limitations
 - quality of the dataset
 - usage of the GPU on Google Colab
- Future work
 - trying out other pre-trained models
 - classifying dishes from other cuisine