Project 1: Image Classification Task

Title: Food Images (Food-101)
Team Member Name: Fali Dillys Honutse , Apurva Ravikar Chavan, Teja Subnana

Section 1: Description of the Dataset

The Food-101 dataset is intended to provide a complete dataset for food image classification tasks. Many subsets are included, making testing on various sample sizes and resolutions versatile and effective. Compared to widely used datasets like CIFAR-10 or MNIST, this one is more interesting and useful because it contains significantly downscaled versions of the original images to facilitate faster training and testing.

1) **food_c101_n1000_r384x384x3.h5**:

- **Categories**: 101
- **Number of Images**: 1,000
- **Resolution**: 384x384 pixels
- **Channels**: 3 (RGB, uint8 format)

2) **food_test_c101_n1000_r32x32x1.h5**:

- **Categories**: 101
- **Number of Images**: 1,000 (Validation Set)
- **Resolution**: 32x32 pixels
- **Channels**: 1 (grayscale, float32 format with values from -1 to 1)

Section 2: Details of the Methodology and Dataset

1) **Work/Project Procedure:**

Convolutional neural networks (CNNs) will be used as part of this study to categorize food photos into one of the 101 categories the Food-101 dataset offers. To guarantee quick

experimentation, we will begin by training the model using the downscaled version of the dataset (food_c101_n1000_r384x384x3.h5). Once the model has been fine-tuned, its performance will be verified using the validation set (food_test_c101_n1000_r32x32x1.h5), which is made up of lower quality (32x32 pixels) grayscale photos.

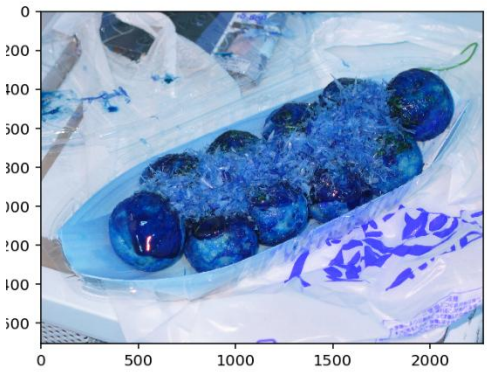
PyTorch will be used to train the model, and in order to maximize performance, we will experiment with various architectures, optimizers, and learning rates. The accuracy and F1-score are two metrics that will be used to assess the model.

2) Tools for Annotation

The dataset is pre-labeled; thus no additional annotations are required. But for any extra annotation or correction required during the project, we might use programs like LabelMe or VGG Image Annotator (VIA).

Below are two additional sample images generated as part of the proposal:

- **Sample 1**:



  - **Label**: [Class Label takoyaki]

- **Sample 2**:

- **Label**: [Class Label beef_carpaccio]

Attachments

- **Research Paper**: https://ieeexplore.ieee.org/document/9441889/citations#citations
- **Online Code**: https://github.com/rileykwok/Food-Classification
- **Dataset Source**: https://www.kaggle.com/datasets/kmader/food41