Capstone weekly report #2

My primary objective for this project is to assist chefs in creating new dishes that are likely to appeal to customers. To pursue this goal, I delved into an article titled 'Using Machine Learning to Generate Recipes That Actually Work.' This article provided insights into the essential factors to consider when employing machine learning for recipe generation. These factors encompassed texture, flavor profiles, ingredient proportions, recipe categories, chemical reactions, and more.

To effectively generate new recipes that resonate with customers, it's imperative that the dataset not only encompasses the aforementioned factors but also includes a diverse range of information. This encompasses textual recipe data, nutritional details, user ratings and reviews, optional recipe images, as well as metadata such as recipe titles, keywords, tags, and difficulty levels.

However, it's apparent that the current limitations, specifically the constraints of time and the absence of a sufficiently robust dataset, may make the immediate use of machine learning for recipe generation challenging.

As a result, I have decided to pivot my focus towards leveraging the existing dataset to construct models aimed at classifying various foods using diverse neural network architectures. During my initial exploration of the food images dataset, I identified an issue of class imbalance. Some food classes had as few as eight images, while others contained over 15,000.

To address this imbalance, I made the strategic choice to narrow down my focus to the top 14 food classes, each of which featured over 1000 images. These classes include hot dogs, sandwiches, donuts, crispy chicken, taquitos, tacos, fries, baked potatoes, chicken curry, cheesecake, apple pie, sushi, omelets, and ice cream.

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Description automatically generated with medium confidence

I subsequently pruned the dataset by removing all other images not pertaining to these 14 chosen food classes. The resulting dataset was then divided into three distinct subsets: 70% for training, 15% for validation, and another 15% for testing. Nevertheless, an issue of class imbalance persisted in the training dataset.

To rectify this, I incorporated class weights to counteract the imbalanced representation of the 14 food classes during model training. Additionally, I developed a function for data augmentation that encompassed various techniques, including rotation, scaling, flipping, cropping, and normalization, among others.

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Description automatically generated]()

In the next phase of this project, I will embark on selecting an appropriate machine learning or deep learning model architecture. My approach will involve experimenting with different pre-trained models, such as VGG, ResNet, Inception, and others, as a foundational starting point. I will then proceed to evaluate and compare their performance accuracy.

Related reading:

1. <https://medium.com/p/b2331c85ab72>