Colette D’Costa
DS 4002
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Classifying Fruit Freshness to Reducing Food Waste

In a world where food sustainability is becoming an urgent priority, the reduction of waste in institutions like universities plays a crucial role in addressing global challenges. Dining halls, like those at UVA, face the persistent issue of identifying and discarding spoiled fruits, often relying on subjective judgment that can lead to either unnecessary waste or the unintentional serving of subpar produce. This inefficiency contributes to food insecurity, financial losses, and increased environmental strain. Advancements in machine learning and computer vision provide an opportunity to address these challenges. By leveraging data, it becomes possible to create tools that can automatically and accurately classify fruits as "fresh" or "spoiled," helping dining services make informed decisions and reduce unnecessary waste. As a data scientist, you hold the unique power to translate complex image data into actionable insights, bridging the gap between sustainability and technology.

In response to this challenge, UVA Dining Services seeks a data scientist to develop a machine learning model capable of identifying fruit freshness. Your work will require an in-depth analysis of an image dataset of fruits, where each image is labeled as either "fresh" or "spoiled." The goal is to build a robust classification model and provide insights that can directly inform dining hall operations. The task begins with data exploration to understand patterns in fruit appearance, followed by the preprocessing and training of a machine learning model. You will evaluate the model’s performance, ensuring reliability and scalability. Finally, your work will highlight opportunities for extending this solution beyond the university to address food waste challenges globally.

By participating in this case study, you are not just building a model, you are contributing to a sustainable future. Your findings could inform dining operations at UVA and serve as a prototype for broader applications in food distribution, agriculture, and retail. This case study offers you the chance to engage with cutting-edge technology while tackling a problem that impacts both local and global communities.Your insights will not only reflect your technical expertise but also your ability to create meaningful change through data science.

Github repository: https://github.com/coletted1/DS-4002-CS3