Hoos Fit*: A Machine Learning-Based Personal Dietitian

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***Abstract*—'Hoos Fit' is an application that will assist UVA students in reaching dietary goals. It will use the information available from product nutrition labels to help users make informed dietary decisions through a recommendation system.**

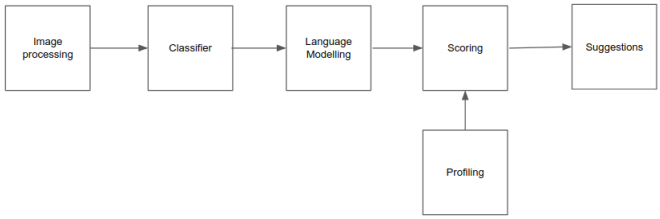
***Index Terms*—nutrition, fitness, nutritional labels, OCR, image processing, machine learning**

I. Motivation

Nutrition is important at every phase of life. It helps us stay stronger and feel better. Regular exercise is important but a balanced diet is essential for staying healthy. This is emphasized more for college students, who are sometimes too busy studying or complete other activities to research a good diet. Staying fit is more about eating smart than working hard. Hence, we present a solution which will help UVA students make smart decisions from the information that is readily available but hard to interpret.

II. Proposed Work

We propose Hoos Fit, an intelligent system that can understand nutrition labels and present appropriate suggestions to the users. The user will set fitness goals and an initial profile in Hoos Fit. Users can then scan product nutrition labels using Hoos Fit, allowing the system to analyze the data and provide information to the user about the scanned item, including a suggestion as to whether the user should consume the product or not based on goals and product content. In order to build the system, we need to build the following blocks shown below.



The first three stages compromise the majority of the machine learning for the project. In the first stage (Image processing), the user will scan an image of the nutrition label and the application will transforms it into a standardized, consumable text for classification. The output of the Image processing stage is broken into smaller patches that are fed to classifier to recognize the characters. Based on the characters generated, we will use a language model to predict the words in order to understand the contents of nutrition label. Based on metrics from Language processing and the user's profile, a score is generated for the product and given to the user. The score is accompanied by a textual recommendation message to give back to the user, who can then provide a response or feedback to the application for future training.

III. Dataset

We are planning to scrape data from the United States Open Food Facts website [1]. This website has over 175,000 products, each with an image of a product's nutrition label. We will process these images to extract the values for the model we using for inference and scoring.

IV. Related Work

Stanford students have previously worked on building over OCR to interpret nutrition label images, achieving almost a 64% success rate in identifying the label items [2].

V. Intended Experiments

We plan on evaluating the algorithm based on its precision/recall for classifying the attributes from the nutrition label. We also plan on evaluating the precision/recall of the recommendation feedback given to the user in order to enhance the inference algorithm's decisions.

References

[1] Open Food Facts - United States. (n.d.). Retrieved from https://us.openfoodfacts.org/.
[2] Gao, L., & Grubert, O. (2014). Recognition of Nutrition Facts Labels from Mobile Images.