

Introduction

Abstract

The purpose of this app is twofold. First, the app will generate a correlative database of foods captured using an iOS smartphone's camera, its known caloric value, and specific user-input metatags. Second, after training using a machine learning algorithm, users will be able to capture images of food with no known correlative caloric values where the app will connect an iOS smartphone using C# to a Python-based machine learning image recognition server with 5G connection to enable a faster image process than conventional methods.

Background

Currently, there is no way for users who want to keep track of their diet to monitor their nutritional intake quickly. The user would have to know what serving portion they are consuming and how many calories are in each product. This may seem straightforward if they are next to the Nutritional Info label on the packaging; however, this is only sometimes the case. The user may join different food products together or buy the food from stores on the go, so the nutritional info is not always readily available. The app's goal is to allow anyone to quickly scan the food they will be eating with their smartphone camera, and through image analysis determine what the nutritional information is, and what the serving size is.



UNIVERSITY OF MIAMI **INSTITUTE for DATA SCIENCE** & COMPUTING

Calorie Checker: An Image-Analysis App for Caloric Estimation in Real Time

Ross Pierson, Rachel Tomasetti, and Nate Joseph Innovate Team, Information Technology, University of Miami, Coral Gables, Florida

Result





Main screen for computer vision using YOLOv8 bject detection using FoodX-251 database

0	Journal					
7/25/2022	Carbs (g)	Protein (g)	Fats (g)	Calories		
	05	4	0	05		
Apple	25	1	0	95		
Cheeseburger	33	15	14	313		
Pasta	42.8	8.1	1.3	220		
Vanilla Ice Cream	15.6	2.3	7.3	137		
7/26/2022			765 Total	Calories		
Oatmeal	27	5	3	95		
Cheese Pizza	27	9.1	7.8	70		
Cheese Pizza	27	9.1	7.8	70		
Cheese Fizza	21					
7/27/2022			235 Total	Calories		
Banana	23	1	0	110		
Burrito	56	17	16	434		
Taco	21	9.4	9.9	210		
Taco	21	9.4	9.9	210		
Taco	21	9.4	9.9	210		
		1174 Total Calories				
7/28/2022		1	174 10181	Calones		
Cheeseburger	33	15	14	313		
Banana	23	1	0	110		
7/29/2022		423 Total Calories				
Apple	25	1	0	95		
Cheeseburger	33	15	14	313		
Apple	25	1	0	95		
Banana	23	1	0	110		
Spaghetti	42.8	8.1	1.3	220		
		1	833 Total	Calories		

Log of all data scanned in a human-readable format with data saved between sessions

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ts						
Jo	urnal	Со	nfirm			
rice Portions: <i>Enter amount</i> Cancel Confirm						
			ок			
1	2	3	$\langle \times \rangle$			
4	5	6	Done			
7	8	9				
	0		J.			
User is prompted to enter the portion size to provide accurate macronutrient data						
Fo	od Name	Food				
	od Carbs	;				
Food Protein 0.31						
Fo 0.1	od Fats					
Fo	od Calori	ies				

Summary

- their diet.
- anyone's hand.

Future Work

- cuisine.
- learning techniques.

References

Jocher, G., Chaurasia, A., & Qiu, J. (2023). YOLO by Ultralytics (Version 8.0.0) [Computer software]. https://github.com/ultralytics/ultralytics Kaur, P., Sikka, K., Wang, W., Belongie, S., & Divakaran, A. (2019). *FoodX-251: A Dataset for Fine-grained Food Classification.*

Acknowledgments

We would like to thank Dr. Will Jin and Dr. Brandon Mahal who are the primary investigators on the project. We would also like to acknowledge all of those who have contributed to this project previously, including Nick Tong, Gaelle Charlet, and Paulina Fiore. Lastly, we would like to thank Max Cacchione who has been overseeing the entirety of the project.

Journal allows for complete user customization of previously scanned food items and their default values

7.5

Date and Time

2022-09-14 11:10

Confirm Changes

Delete Entry

INFORMATION TECHNOLOGY INNOVATE

Conclusions

Current version of app is positioned to be of great value to those needing or wanting a more precise view of

Advancement of smartphone camera technology and computational efficiencies allows for a novel app utilizing state-of-the-art image analysis in the palm of

App can be expanded to include more food groups, allowing for a more diverse selection to include local

Will allow users to input new foods to continue training and adapting the model, with focus into zero-shot

Will allow for open-sourcing of AI training data via automatic uploads to a cloud database.

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