The Ciência & Engenharia - Science & Engineering Journal
ISSN: 0103-944X
Volume 10 Issue 1, 2022
pp: 149 - 153

Ai-Powered Nutrition Analyzer for Fitness Enthusiasts

[1]C.Shilpa, [2]C .S. Tahaseen Sultana, [3]C. Madhavi, [4]E.Vani Sree
[1,2,3,4] UG Student, Department of Electronics and Communication Engineering,
Dr K V Subba Reddy College Of Engineering For Women, Kurnool, Andhra Pradesh, India

Abstract

Numerous healthcare conventions have focused on the issue of food, which is necessary for human life. With the advent of new dietary assessment and nutrition analysis tools, more opportunities exist to assist individuals in comprehending their routine eating patterns, examining nutrition patterns, and sustaining a healthy diet. We will use a small number of foods to determine the nutrition content of our daily intakes as part of this nutrition image analysis project. The project's goal is to develop a web application that uses an API to classify food items and determine their nutritional value. The model compares the user's input to the pre-trained model, classifies the food example (such as apple, tomato, etc.), and displays that food item's nutrition content for the interface.

1. Introduction

Numerous healthcare conventions have focused on the issue of food, which is necessary for human life. With the advent of new dietary assessment and nutrition analysis tools, more opportunities exist to assist individuals in comprehending their routine eating patterns, examining nutrition patterns, and sustaining a healthy diet. The process of determining a food's nutritional content is called nutritional analysis. It is an essential component of analytical chemistry that provides information about food contamination, processing, chemical composition, and quality control.

The project's primary objective is to construct a model that can be used to classify fruits according to various characteristics like color, shape, texture, and so on. The user can take pictures of various fruits here, and the image will be sent to the trained model. Based on the fruits, the model analyzes the image and finds nutrition information like calories, fiber, sugar, and protein.

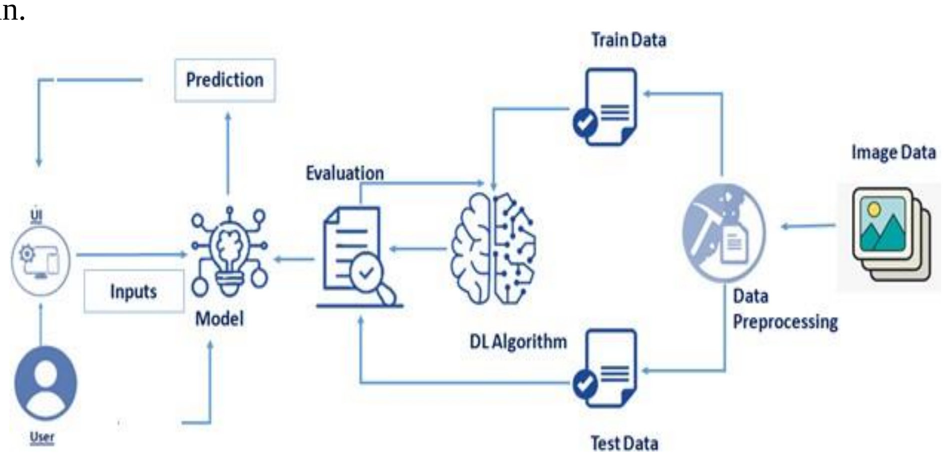

Fig.1 Technical Architecture

The Ciência & Engenharia - Science & Engineering Journal
ISSN: 0103-944X
Volume 10 Issue 1, 2022
pp: 149 - 153

2. Literature Review

American computer scientist John McCarthy (1927–2011) first proposed the term "artificial intelligence" in 1955 in a proposal for a research project that was carried out the following year at Dartmouth College in Hanover, New Hampshire. In experimental and clinical medicine, the field of computer science known as artificial intelligence (AI) is increasingly being used to mimic thought processes, learning abilities, and knowledge management. Applications of artificial intelligence (AI) in biomedical sciences and medicine have grown significantly in recent decades. The applications of artificial intelligence in the areas of risk prediction, therapeutic technique support, and medical diagnostics are expanding rapidly. Clinical benefits that are measurable have been achieved as a result of the application of AI in ophthalmological, radiological, and cardiac diagnostics. New pharmaceutical research utilized AI. Additionally, the development of AI opens up new avenues for nutrition and medical sensing technology research. .

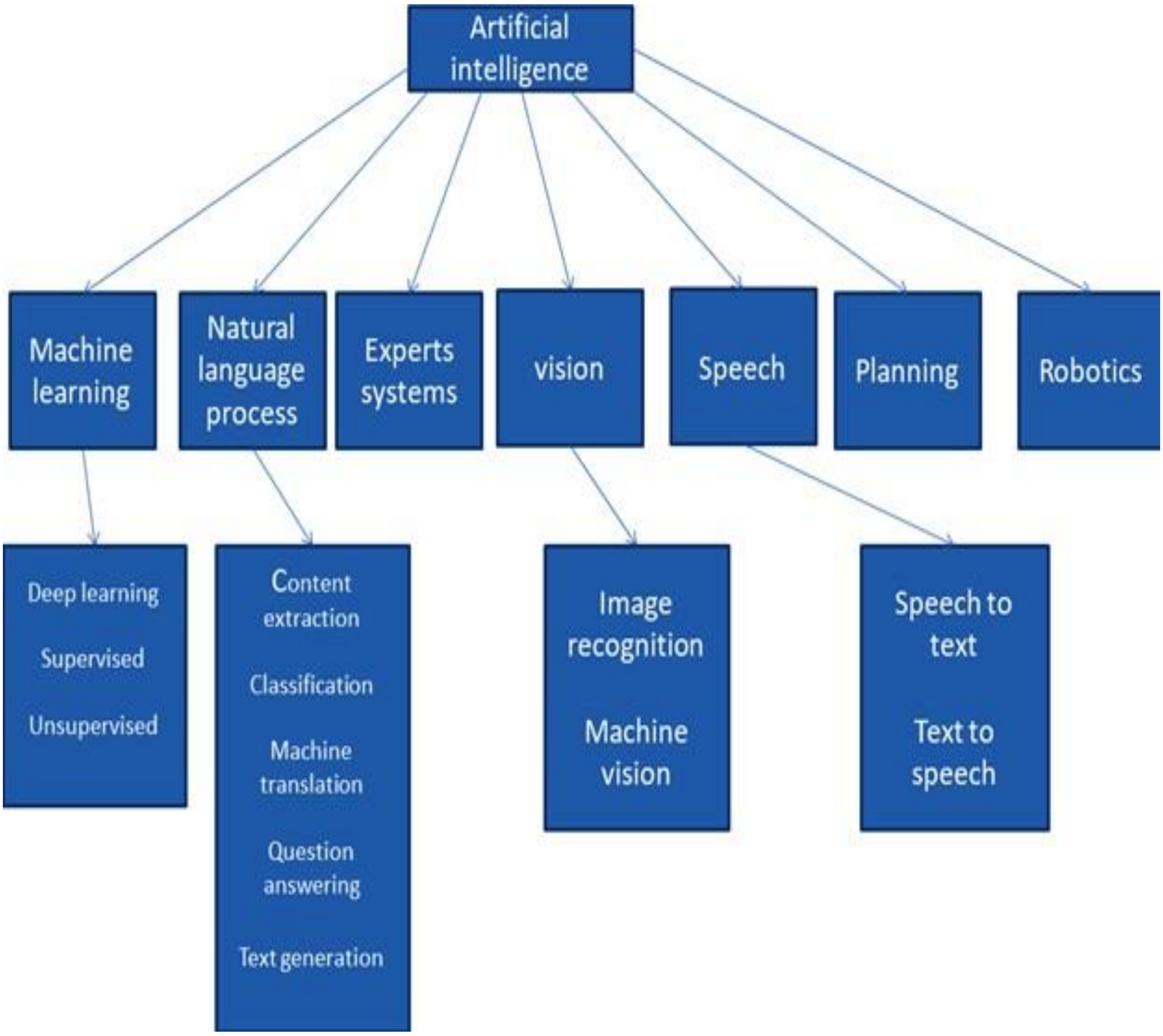

Fig.2 Block diagram of Artificial Intelligence

While a number of definitions of artificial intelligence (AI) have surfaced over the last few decades, John McCarthy offers the following definition 2004 paper " It is the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable."

Stuart Russell and Peter Norvig then proceeded to publish, Artificial Intelligence: A Modern Approach (link resides outside IBM), becoming one of the leading textbooks in the study of AI. In it, they delve into four potential goals or definitions of AI, which differentiates computer systems on the basis of rationality and thinking vs. acting

3. Proposed System

An activation is produced by applying a simple filter to an input in a convolution. A feature map, which depicts the locations and strength of a detected feature in an input, such as an image, is produced by repeatedly applying the same filter to an input.

The ability to automatically learn a large number of filters specific to a training dataset in parallel within the constraints of a specific predictive modeling problem, such as image classification, is an innovation of convolutional neural networks. The end result is very specific features that can be found in any image input. A specialized type of neural network model known as a convolutional neural network, or CNN for short, is made to work with two-dimensional image data but can also be used with one-dimensional and three-dimensional data.

The convolutional layer that gives the convolutional neural network its name is its most important component. A procedure known as a "convolution" is carried out by this layer. A convolution is a linear operation that, like a traditional neural network, involves multiplying a set of weights with the input in a convolutional neural network. The multiplication is done between an array of input data and a two-dimensional array of weights, called a kernel or filter, because the method was made for two-dimensional input.

The type of multiplication used between a patch of input data of filter size and the filter is a dot product, and the filter is smaller than the input data. A dot product is the sum of the element-wise multiplications between the input and filter's filter-sized patch, which always produces a single value. The operation is frequently referred to as the "scalar product" due to the single value it produces. Because it allows the same filter (weight set) to be multiplied by the input array multiple times at various points on the input, using a filter that is smaller than the input is deliberate. In particular, the filter is applied sequentially, from left to right and from top to bottom, to each overlapping part or filter-sized patch of the input data.

The Ciência & Engenharia - Science & Engineering Journal
ISSN: 0103-944X
Volume 10 Issue 1, 2022
pp: 149 - 153

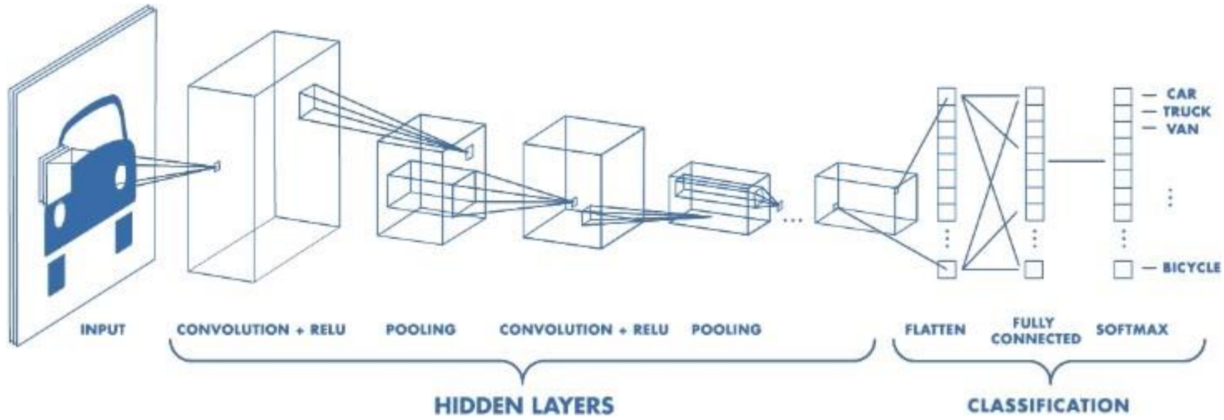

Fig.3 Layers of CNN

Now that we have trained our model, let us build our flask application which will be running in our local browser with a user interface. In the flask application, the input parameters are taken from the HTML page These factors are then given to the model to predict the type of food and to know the nutrition content in it . In order to know the nutrition content we will be using an API in this project

Fig.4 Output Window

5.Conclusion

The purpose of this research was to ascertain how nutrition information about fruits affected fitness enthusiasts. The train dataset of figures' nutritional data, such as sugar, fiber, carbohydrates, total fat, potassium, saturated fat, protein, and cholesterol calories, are displayed here. If nutritional information is provided at the point of consumption, subsequent studies could compare individuals' levels of guilt in the event that the item chosen contains a lot of calories. Fitness enthusiasts can use it to analyze their nutrient intake. Because our

The Ciência & Engenharia - Science & Engineering Journal
ISSN: 0103-944X
Volume 10 Issue 1, 2022
pp: 149 - 153

trained dataset only contains a small amount of trained data, it can only provide results for specific images of fruits. In the future, we hope to create a larger, more trained dataset that can be used to analyze a greater variety of food items and nutrients.

References

1. Ahmedin, J., Ward, E., & Hao, Y. (2005) Trends in the Leading Causes of Death in the United States, 1970-2002. JAMA, 294, 1255-1259.
2. Albright, C. (1990) Restaurant Menu Labeling: Impact of Nutrition Information on Entrée Sales and Patron Attitudes. Health Education Quarterly, 17(2), 157-167
3. Balasubramanian, S., Cole K. (2002) Consumers' search and use of nutrition information: The challenge and promise of the Nutrition Labeling and Education Act. Journal of Marketing, 66, 112-127
4. Bleich, S., Pollack, K. (2010) The publics' understanding of daily caloric recommendations and their perceptions of calorie posting on chain restaurants. Public Health, 121(10) 1-10.
5. Bowman, S., Vinyard, B. (2004) Fast food consumption of U.S. Adults: Impact on energy and nutrient intakes and overweight status. Journal of the American College of Nutrition,
6. 23(2) 163-168.
7. Chu, Y. (2009) Improving Patrons' Meal Selections Through the Use of Point-of-Selection Nutrition Labels. American Journal of Public Health, 99(11), 2001-2005
8. Elbel, B., Gyamfi, J., & Kersh, R. (2011) Child and adolescent fast food choice and the influence of calorie labeling: a natural experiment. International Journal of Obesity, February 2011,.
9. Epstein, L., Lin, H., Carr, K., & Fletcher, K. (2011). Food reinforcement and obesity.
10. Psychological moderators. Appetite, in-Press
11. Finkelstein, E., Strombotne, K., Chan, N., & Krieger, J. (2011) Mandatory Menu Labeling in One Fast Food Chain in King County, Washington. American Journal of Preventive Medicine, 40(2), 122-127.
12. Goldstein, D.J. (1992) Beneficial Health Effects of Modest Weight Loss. International Journal of Obesity and Related Metabolic Disorders, 16(6), 397–415.
13. Hwang, J., Lorenzen, C. (2008) Effective nutrition labeling of restaurant menu and pricing of healthy menu. Journal of Foodservice, 19, 270-276.
14. Jacobson, B., DeBock, D. (2001) Comparison of body mass index by self-reported verses measured height and weight. Perceptual and Motor Skills, 92, 128-132.
15. Jones, C. (2009) Taking up space? How consumers react to health information and health icons on restaurant menus. Journal of Foodservice Business Research, 12(4), 344- 363.
16. Lindhorst, K. Lynda C. Susan R. Sharon Z. (2007). Rural Consumers' attitudes towards nutritional labeling. Canadian Journal of Dietetic Practice and Research, 3(68), 146- 149