

Ideation Phase

Literature Survey

Date	25 September 2022
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Project Name	AI POWERED NUTRITION ANALYZER FOR FITNESS ENTHUSIASTS

[1] Fruit Classification using Convolutional Neural Network via Adjust Parameter and Data Enhancement.

Authors : Liuchen Wu; Hui Zhang; Ruibo Chen; Junfei Yi

Published in: 2021 IEEE International Conference on Machine Learning and Applied Network Technologies (ICMLANT)

Fruit is one of the most popular products in the market. Automatic and accurate classification of fruit can bring great convenience to fruit sellers. However, there are great similarities between some apple varieties and pears and peaches, and these kinds of fruit are generally popular, which has increased the difficulty of this task. Aiming at this problem, this paper proposes a method of fruit automatic recognition and classification based on convolutional neural network. First, we obtained two color fruit image data set (public data set and self-made data set). The public data sets is composed of fruit images with simple background, while the fruit images in the self-made data set are taken in a complex environment. Then, on the basis of convolutional neural network, we conducted several research experiments through parameter adjustment, and achieved the highest average classification accuracy of 99.8% on the public data set. In the self-made data set, the classification accuracy is 90.2%. Finally, we improved the classification accuracy of the self-made data set from the original 90.2% to 98.9% by adopting appropriate data enhancement techniques.

[2] Indian Food Image Classification with Transfer Learning

Authors : J R Rajayogi; G Manjunath; G Shobha

Published in: 2019 4th International Conference on Computational Systems and Information Technology for Sustainable Solution (CSITSS)

Image classification has become easier with deep learning and availability of larger datasets and computational resources. The Convolutional neural network is the most popular and widely used image classification technique in the recent days. In this paper image classification is performed on Indian food dataset using different transfer learning

techniques. The food plays important role in human's life as it provides us different nutrients and hence it is necessary for every individual to keep a watch on their eating habits. Therefore, food classification is a quintessential thing for a healthier life style. Unlike the traditional methods of building a model from the scratch, pre trained models are used in this project which saves the computation time and cost and also has given better results. The Indian food dataset of 20 classes with 500 images in each class is used for training and validating. The models used are InceptionV3, VGG16, VGG19 and ResNet. After experimentation it was found that Google InceptionV3 outperformed other models with an accuracy of 87.9% and loss rate of 0.5893.

[3] Convolutional Neural Network (CNN) for Image Detection and Recognition

Authors : Rahul Chauhan; Kamal Kumar Ghanshala; R.C Joshi

Published in: 2018 First International Conference on Secure Cyber Computing and Communication (ICSCCC)

Deep Learning algorithms are designed in such a way that they mimic the function of the human cerebral cortex. These algorithms are representations of deep neural networks i.e. neural networks with many hidden layers. Convolutional neural networks are deep learning algorithms that can train large datasets with millions of parameters, in form of 2D images as input and convolve it with filters to produce the desired outputs. In this article, CNN models are built to evaluate its performance on image recognition and detection datasets. The algorithm is implemented on MNIST and CIFAR-10 dataset and its performance are evaluated. The accuracy of models on MNIST is 99.6 %, CIFAR-10 is using real-time data augmentation and dropout on CPU unit.

[4] Vision-Based Approaches for Automatic Food Recognition and Dietary Assessment: A Survey

Authors : MOHAMMED AHMED SUBHI, (Member, IEEE), SAWAL HAMID ALI , (Member, IEEE), AND MOHAMMED ABULAMEER MOHAMMED2

Consuming the proper amount and right type of food have been the concern of many dieticians and healthcare conventions. In addition to physical activity and exercises, maintaining a healthy diet is necessary to avoid obesity and other health-related issues, such as diabetes, stroke, and many cardiovascular diseases. Recent advancements in machine learning applications and technologies have made it possible to develop automatic or semi-automatic dietary assessment solutions, which is a more convenient approach to monitor daily food intake and control eating habits. These solutions aim to address the issues found in the traditional dietary monitoring systems that suffer from imprecision, underreporting, time consumption, and low adherence. In this paper, the recent vision-based approaches and techniques have been widely explored to outline the current approaches and methodologies used for automatic dietary assessment, their performances, feasibility, and unaddressed challenges and issues.