Paper-2

Summary

**An Explainable CNN and Vision Transformer-Based Approach for Real-Time Food Recognition".**

This paper presents a narrative method for food recall that combines Vision Transformers (ViTs) with Convolutional Neural Networks (CNNs). The researchers want to increase the accuracy and effectiveness of food item verification in photos, which is becoming more and more crucial in fields like dietary analysis and nutrition tracking.

Background and Motivation A critical aspect of computational gastronomy is food picture verification, which finds use in everything from nutritional ratings to meal monitoring. Because CNNs can capture local elements, they have been frequently resorted to for image identification; even so, they have trouble including the larger context of complex dishes. This restriction may make it more difficult to tell apart foods that look similar. To overcome this, the authors suggest a hybrid model that better handles local and global features in food photos by utilizing the advantages of both CNNs and ViTs.

Techniques The suggested model begins by withdrawing local features from food photos using a ResNet50 backbone. After processing these features, a ViT encrypt records the global context and connections between various image elements. The authors' hybrid technique surpasses current state-of-the-art techniques, as explained by their studies on five different food datasets. To increase user confidence in the system, they also used accountable AI approaches like Grad-CAM and LIME to shed light on the model's prediction-making process.

Results The outcomes exhibit that the hybrid model greatly increased the accuracy of food recognition across a range of datasets. The system became more transparent and dependable when clarity approaches were contained, enabling users to apprehend which features affected the model's judgments.

In conclusion, The study opens the door for useful applications in customized nutrition and healthcare by showing the potential of integrating CNNs and ViTs for real-time food recognition. To improve dietary treatments and alter nutritional sciences, the authors stress the importance of artificial intelligence. They also recognize the issues that still exist, like the fluctuating datasets and the requirement for additional mobile application optimization.