Development of an Image-based Food Recognition and Nutrient Profiling System

NGADI M. (1), ONADIPE B. (1), KWOFIE E. (1)
1 McGill University, Montreal, Canada

Diets have high impact on nutrition-related illnesses and incidence of mortality among different population groups around the world. Dietary and nutritional status assessment currently rely on expensive, tedious and time-consuming monitoring procedures that are prone to flaws from data-gathering practices, human subjective attitude, and daily variations in a user's dietary intake. In this study, we propose an artificial intelligence-based dietary assessment system composed of an image-based food recognition network and a nutrient profiling method. Specifically, once the user captures the food image before consumption, the system identifies the food, retrieves the nutrient information from nutrient composition database, and then computes the nutrient profiling scores using the SAIN-LIM nutrient profiling model. Moreover, we provide a large-scale dataset of nutrient-labeled food images for dietary assessment. Experiments show that the proposed system performs effectively and efficiently on dietary assessment. The developed system can serve as a useful tool that enables users to self-administer and evaluate their food records as well as enables dietary researchers to track and analyze nutrition goals of clients and population groups.