AI-powered Nutrition Analyzer for Fitness Enthusiasts

ABSTRACT

Literature has indicated that accurate dietary assessment is very important for assessing the effectiveness of weight loss interventions. However, most of the existing dietary assessment methods rely on memory. With the help of pervasive mobile devices and rich cloud services, it is now possible to develop new computer-aided food recognition system for accurate dietary assessment. However, enabling this future Internet of Things-based dietary assessment imposes several fundamental challenges on algorithm development and system design.

INTRODUCTION

In the last few years, we have witnessed an explosive increase of mobile and wearable computing devices (e.g., the smart watch and smart phone) in the consuming electronics market. One common characteristic of these devices is that many of them have inexpensive, unobtrusive and multimodal sensors. These sensors enable us to collect multimedia data (e.g., video and audio) in natural living environments. Due to the ubiquitous nature of mobile and wearable devices, it is now possible to use these devices to develop pervasive, automated solutions for dietary assessment.

One example of such solutions is to use mobile devices as a pervasive food journal collection tool and to employ cloud service as a data analysis platform. The combination of mobile device and cloud service could contribute to improving the accuracy of dietary assessment. As a result, in the last few years, we have seen several mobile cloud software solutions 12 to 14 to improve the accuracy of dietary intake estimation. One common issue among these solutions is that the users of the software must enter what they have eaten manually.

REFERENCES:

1. R. R. Wing and S. Phelan, "Long-term weight loss maintenance," The American journal of clinical nutrition vol. 82, pp. 222S-225S, 2005.

2. N. Dalal and B. Triggs, "Histograms of oriented gradients for human detection," 2005, pp. 886-893.

3. M. Lin, Q. Chen, and S. Yan, "Network in network," arXiv preprint arXiv:1312.4400, 2013.

4. A. Holovaty and J. Kaplan-Moss, The definitive guide to Django: Web development done right: Apress, 2009.

5. G. Bradski and A. Kaehler, Learning OpenCV: Computer vision with the OpenCV library: " O'Reilly Media, Inc.", 2008.

6. S. Yang, M. Chen, D. Pomerleau, and R. Sukthankar, "Food recognition using statistics of pairwise local features," in Computer Vision and Pattern Recognition (CVPR), 2010 IEEE Conference on, 2010, pp. 2249-2256.

7. C. Xu, Y. He, N. Khannan, A. Parra, C. Boushey, and E. Delp, "Image-based food volume estimation," in Proceedings of the 5th international workshop on Multimedia for cooking & eating activities, 2013, pp. 75-80.

8. Y. Kawano and K. Yanai, "Food image recognition with deep convolutional features," in Proceedings of the 2014 ACM International Joint Conference on Pervasive and Ubiquitous Computing: Adjunct Publication, 2014, pp. 589-593.

9. C. Liu, Y. Cao, Y. Luo, G. Chen, V. Vokkarane, and Y. Ma, "DeepFood: Deep Learning-based Food Image Recognition for Computer-aided Dietary Assessment," in Proof. of The 14th International Conference on Smart homes and Health telematics (ICOST 2016), Wuhan, China, 2016.

10. R. Steele, "An overview of the state of the art of automated capture of dietary intake information," Critical Reviews in Food Science and Nutrition, 2013.