

# **A Unified Sensor System for Ubiquitous Assessment of Diet and Physical Activity**

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Obesity is associated with a large variety of genetic and environmental factors. In order to understand the etiology of this condition and develop effective weight management programs, accurate acquisition of diet and physical activity data in the free-living environment is essential. Currently, self-reporting has been the primary method for data acquisition which cannot accurately reflect the habitual behavior of individuals in real life. As a result, lacking assessment tools that produce unbiased, objective data has significantly hampered the progress of obesity research. We propose to develop a unified sensor device which is cosmetically pleasant and can be easily worn by patients. This device will consist of a set of physiological sensors and a miniature video camera. The camera will be specially configured to record the same scene as the wearer perceives. The data recorded will be uploaded to a powerful computer where extensive multimedia processing will be performed to de-identify human appearances in the video and organize information using the e-chronicle technology. Diet and activity related events will be automatically or semi-automatically extracted, indexed, and organized into an easily accessible form. At the end of the proposed project, we will provide a new platform technology to study lifestyle, behavior, and environment that promise new understanding and effective treatment of obesity.