

## Smart Home-Based Health Platform for Behavioral Monitoring and Alteration of Diabetes Patients

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### Abstract

#### **Background:**

Researchers and medical practitioners have long sought the ability to continuously and automatically monitor patients beyond the confines of a doctor's office. We describe a smart home monitoring and analysis platform that facilitates the automatic gathering of rich databases of behavioral information in a manner that is transparent to the patient. Collected information will be automatically or manually analyzed and reported to the caregivers and may be interpreted for behavioral modification in the patient.

#### **Method:**

Our health platform consists of five technology layers. The architecture is designed to be flexible, extensible, and transparent, to support plug-and-play operation of new devices and components, and to provide remote monitoring and programming opportunities.

#### **Results:**

The smart home-based health platform technologies have been tested in two physical smart environments. Data that are collected in these implemented physical layers are processed and analyzed by our activity recognition and chewing classification algorithms. All of these components have yielded accurate analyses for subjects in the smart environment test beds.

#### **Conclusions:**

This work represents an important first step in the field of smart environment-based health monitoring and assistance. The architecture can be used to monitor the activity, diet, and exercise compliance of diabetes patients and evaluate the effects of alternative medicine and behavior regimens. We believe these technologies are essential for providing accessible, low-cost health assistance in an individual's own home and for providing the best possible quality of life for individuals with diabetes.

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**Abbreviation:** (GTSH) Gator Tech smart house

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