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Automatic Personal Daily Activity Tracking

Tech ID: 29192 / UC Case 2018-228-0

BRIEF DESCRIPTION

Researchers at UCI have developed an entirely unobtrusive method for chronicling and analyzing an individual's daily activities over time, which relies on tracking user activity via their smartphone. This technology has important applications in health and behavior monitoring, where it can be used to signal the early stages of various diseases and disorders.

FULL DESCRIPTION

Personalized daily activity chronicles, which present an organized break down of a person's daily activities, have been an area of active thought and research since their first description in 1945. Such chronicles can shed significant insight into an individual's health and behavior, and may even provide early indicators of physical or mental health disorders. Recent advances in inbuilt sensors (cameras, microphones, location trackers) of modern day smartphones have opened up new possibilities for continuous, unobtrusive monitoring of a person's activities. Methods that utilize smartphone activity, called "context aware" approaches, harness data collected from existing applications, tracking events such as "walking", "driving", "social media use", "texting", etc. To truly understand a person's activities, these events must be interpreted into higher-order and more meaningful "daily activities", which include more specialized classifications such as "commuting to work", "working", "socializing", "relaxing", etc. Currently, there are limited comprehensive methods for collecting and analyzing data recorded via smartphone use, and translating this data into meaningful daily activities.

Researchers at UCI have recently developed an integrated method to address this need. The application collects user data from various smartphone sensors and applications, which are synchronized within the application to track simple events (e.g., walking, sitting, texting). A novel context aware framework, called Bagging Formal Concept Analysis (BFCA), then translates this raw data into meaningful activities (e.g., commuting, working, socializing). These activities, organized into a personal daily chronicle, allow users to track things like productivity, physical activity, and social interactions within a given day. Additionally, comparison of these trends over time can serve as a useful indicator of changes to health, such as the onset of depression (increased sleep and decreased socialization) or diabetes (increased bathroom use).

SUGGESTED USES

- » Personalized health monitoring.
- » Human subjects research in the fields of psychology, physiology, medicine

ADVANTAGES

- » **Unobtrusive:** Data is collected automatically from all sensors and applications in a smartphone, without any user intervention or action required.
- » **Objective:** Unlike other methods which rely on users self-reporting their activities, this method relies entirely on data collected from a user's phone use and thereby provides an objective chronicle.

CONTACT

Ben Chu
ben.chu@uci.edu
tel: .



OTHER INFORMATION

CATEGORIZED AS

- » **Computer**
 - » Software
- » **Medical**
 - » Diagnostics
 - » Research Tools
 - » Software
- » **Research Tools**
 - » Other
- » **Sensors & Instrumentation**
 - » Environmental Sensors
 - » Other
 - » Scientific/Research

RELATED CASES

» **Ubiquitous:** This technology utilizes an incredibly common device, and requires no additional equipment beyond a standard smartphone. In the US alone, nearly 70% of citizens own and regularly use smartphones.

» **Non-disruptive:** Data collection and interpretation happens entirely within the application, and so does not intervene with a user's natural life patterns.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,594,315	02/28/2023	2018-228

STATE OF DEVELOPMENT

Working prototype

UCI Beall
Applied Innovation

5270 California Avenue / Irvine, CA
92697-7700 / Tel: 949.824.2683



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