February 03, 2016

MULTIPLE DEVICE AND SENSOR BASED USER RECOGNITION

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ABSTRACT

This document discloses a method for recognizing a user using the sum of personal information gathered from several sensors equipped in multiple devices that are accessible in a given proximity of time, space or relationship. In some instances, algorithms may be required to reconcile the discrepancies among information gathered from many sensors, and sometimes users may be informed about the discrepancies. The advantages of the method include improvement in user recognition accuracy by checking against multiple signals.

BACKGROUND

User identification or recognition using a single sensor such as voice, motion, infrared (IR), near field communication (NFC), camera, or fingerprint scanner usually results in mistakes and a suboptimal user experience. For example, a moving pet often triggers a home security alarm, a human shaped figure captured by a camera in a video game console may trigger unnecessary prompts, such as “Hi (Username)!”. Further, a voice command may trigger voice recognition in multiple devices that are in proximity.

The rapid adoption of personal computing devices has meant that more and more people are simultaneously using multiple devices such as smart watches, smart fitness products, smartphones, smart game console, thermometer, or even smart cars that are equipped with various sensors. The resulting diversity of detectable signals from multiple devices could be leveraged to uniquely recognize a user in a given proximity of space, time and relationship.

DESCRIPTION

A method for recognizing a user reliably using the sum of personal information gathered from several sensors equipped in multiple devices that are accessible in a given proximity of time, space and relationship is disclosed. The sensors may be voice, motion, GPS, optical or IR image, NFC, or Bluetooth.

The signals used to determine the sensors or devices in proximity to a given user may include:

- Proximity of time: many sensors may recognize the user almost at the same time.
- Proximity of space: many sensors that are close in space recognize the same user in a reasonable region. User movement mode such as moving or stable, walking or running, biking or driving and geological or traffic information such as streets, rivers, snowing or accidents, are leveraged to determine a reasonable region.
- Proximity of relationship: sensors in devices may be exclusively owned, shared with limited groups such as coworkers, family or friends, and/or the public.

In one instance, some technical communications among devices may be required to gather sensor information across devices. For example, a smart gaming console may send a photo detected by its camera to a smartphone when both are in the same living room. It may send the original photo of the recognized users with levels of certainties to the phone. For example, 95% likely to be the father, 50% likely to be the first son and 30% likely to be the second son etc.

In the process of recognizing a user, the information from different sensors may be weighted based either on proximity as stated above, or preference set by a user, as well as the urgency and importance of a task that a user is issuing to the system. For example, “calling 911” shall receive high priority regardless of how certain a user is, as determined by all the sensors.

In some instances, algorithms may be required to reconcile the discrepancies among information gathered from many sensors, and in some instances users may be informed about the discrepancies. For example, if the user’s shape is recognized with high confidence by a home smart game console, while the user’s voice is recognized by his smartphone at the office at the same time, the user may receive a phone message such as “Somebody who looks like you is in your living room”. As another example, if the GPS on the phone recognizes that the user is at work, but the living room camera detects a person, then an alert may be triggered.

The method for recognizing a user can be implemented with any new or existing communication devices. The advantages of the method include improvement in user recognition accuracy by checking against multiple signals, identifying a false prompt in other devices not belonging to the user and eliminating discrepancies among multiple devices. The user also could be alerted to illegitimate access or identification uses by others.