Vision Document

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Introduction

The goal of this project is to develop a wearable device (based on Galileo) that will lead the wearer to a particular location. When activated the device will lead the wearer along the correct path to their destination by signalling when to turn left or right. It will do this by getting directions from Google maps (or similar). It will also upload the wearers current position and route to the cloud. Another feature of this device is letting the carer know if the wearer has left the boundary after curfew by sending a text message to the carer. Also if the wearer falls it will alert the carer to let them know that the wearer has fallen via text message.

Requirements

The main requirements for this project is to create a wearable device that once activated the device would direct the wearer to a location that is stored on the cloud. The cloud part of the project should display where the person is located and at what time they were at that position. The cloud would also show the route that they have walked.

For the project I will be working with the Galileo board by Intel to develop the device for the project. The Galileo board is designed by Intel and is the first one of the Arduino board family based on Intel architecture specifically designed for makers, students, educators etc. The Galileo board provides the user a fully open source software and hardware development and delivers a more advanced compute functionality for people already familiar with the Arduino prototyping tools[01].

The operating system for the Galileo board is based off of Linux which is mounted on a micro SD card.
The cloud needs to be secured so not just anybody can see where the wearer of the device is located. For the cloud only people that is connected to the wearer family members, carers, etc have the login details to be able to locate the wearer if they decide to wander off or get lost.

An accelerometer is a device that measures g-force. Accelerometers are used in many devices such as smart phones, navigation systems for aircraft and missiles, drones for flight stabilization, etc. Single and multi axis accelerometers are available to detect the direction and magnitude of g-force. Accelerometers can also be used to detect orientation, vibration, shock, and falling. Micro accelerometers are increasingly present in portable devices, video game controllers, etc[02]. The accelerometer in this project will measure the impact of a fall and will alert the carer to let them know that the wearer has fallen over.

A boundary can be set up so if the wearer leaves the boundary after curfew the carer will be notified and they can pick them up and bring them back.

Example of use

Scenario 1

If John the wearer of the device wanders about in the streets and gets lost then all John has to do is press a button on the device and the device will connect to the cloud and uses the location address of John's home and directs him home.

Scenario 2

Mary is an Alzheimer's patient and decides to leave the house and wanders the streets without any company. The device would send an alert to Mary's carers that she has left the perimeter. The carers can log on to the cloud interface and are able to locate Mary and see the route she has taken. The carers can then pick up Mary and bring her back home.

Scenario 3

Pat is an elderly person living on his own and while walking around, he trips and falls and is unable to get back up. The accelerometer in the wearable device detects that he has fallen and sends an alert to his emergency contacts or to the emergency services along with his address.

References

[01] Intel(October 2013), Intel® Galileo Gen 2 Development Board, Intel.ie, http://www.intel.ie/content/www/ie/en/do-it-yourself/galileo-maker-quark-board.html [Accessed 05/10/2014].

[02] Wiki(Updated October 2014), Accelerometer, Wikipedia, http://en.wikipedia.org/wiki/Accelerometer, [Accessed 08/10/2014]