Current devices that address sleepwalking are often too bulky and inefficient for preventing positives. Although its main purpose is to address sleepwalking, it can be used in other applications such as or privately purchased. Bluetooth codes were altered with approval from the category/parasomnias/sleepwalking/overview-facts (Accessed: June 15, 2016).

The product will stop the patient from leaving the area unknowingly due to sleepwalking or any other toddler monitoring where it ensures that the child does not leave the house or go into unwanted spaces in the house. It can also be used in monitoring the whereabouts of elderly patients with mental problems by alerting the patient with a loud noise and simultaneously alerting the guardian through an Android application when the unique advertising data is received.

All software used were procured ethically as freeware, through UTD computers, the guardians’ phone. If the reed switch is tripped and the wearable is within range, and alarm will sound at the door and on the guardian’s phone. This ensures that the alarm will ring only if the sleepwalker opens the door. The guardian can change customize the device through the Application in the guardian phone. When the sleepwalker attempts to open the door, an alarm will also sound. The alarm at the door will only activate if the sleepwalker is at the door in order to eliminate false positives.

Bluetooth Low Energy was used in all components and programmed through Code Composer Studio. A hardware interrupt is coded onto the Wearable, triggered by the accelerometer. Return Signal Strength Indicator (RSSI) was used to determine the needed range between Wearable and Door Module. Advertising (Broadcast) data, illustrated in Figure 1, is changed and used to communicate with the Phone. The Android Application is coded through Android Studio and allows a guardian to monitor the sleepwalker. SolidWorks was used to model the cases. All software used were procured ethically as freeware, through UTD computers, or privately purchased. Bluetooth codes were altered with approval from the project sponsor, TXBDC, or as Texas Instruments samples.

The interrupt prompts the Wearable to connect to the Door Module if it is within determined RSSI range. After pairing, the Door Module disconnects and relays advertising data to the guardians’ phone. If the reed switch is tripped and the wearable is within range, and alarm will sound at the door and on the guardian’s phone. This ensures that the alarm will ring only if the sleepwalker opens the door. The guardian can change customize the device through the Application in the guardian phone. When the sleepwalker attempts to open the door, an alarm will also sound. The alarm at the door will only activate if the sleepwalker is at the door in order to eliminate false positives.

Three components, as shown in Figure 2: Wearable, Door Module, and an Android phone application. When the sleepwalker attempts to open the door, an alarm will also sound. The alarm at the door will only activate if the sleepwalker is at the door in order to eliminate false positives.

The Door Module is designed to have a holder permanently attached to the door, but the module itself can be taken out of the holder for recharging.

The Texas Biomedical Device Center, our professors Dr. Polk, Dr. Pacheco, and Dr. Hart, our faculty advisor Dr. Holand, every personnel of the UT Design Studio, our fellow classmates, family and friends, and The University of Texas at Dallas.

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The Somnix Custos Monitoring Device protects sleepwalkers from serious harm and has the potential to open doors into other applications that ensures the safety of the user through location monitoring. An investment in this project is an investment in saved lives.

References


Thank you.

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