New media students develop fall detection device for older adults

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University of Maine seniors in the New Media Department are developing a fall detection device for older adults to use outside their homes.

Benjamin Herold-Porter of Biddeford, Maine, and Heather Anderson of Jonesboro, Maine, have created a prototype that can detect when the person wearing the device has fallen and automatically text a programmed cell phone number without requiring user action.

The students, who were enrolled in a new media wearable device class before starting their capstone, were inspired to create a device that would be of use and benefit to their relatives.

Both Herold-Porter and Anderson have fairly active grandmothers in their 80s who have fallen while alone outside their homes. With current devices, Herold-Porter worries his grandmother would forget to press a button when she falls. Anderson says her grandmother, who lives in a big house and carries her own firewood, would need a device that allows mobility and provides extra peace of mind.

Current fall detection devices on the market require the user to initiative service by pressing a button or calling, the students say. In addition, the most popular models consist of a central hub that is placed in the home and limits the device to a 150-foot radius. The students' prototype relies on mobile networks and can be used anywhere.

The device consists of three major parts: an accelerometer or gyroscope that detects movement; a mini cellphone module that provides access to mobile networks; and a microcontroller or minicomputer that interprets the data from the sensor and tells the cellphone to send a text message. The pieces are wired together and stored in a plastic case made by a UMaine mechanical engineering student that can be worn on a lanyard around the neck.

One out of three adults aged 65 or older falls each year, according to the Centers for Disease Control, and among older adults, falls are the leading cause of both fatal and nonfatal injuries. At 80 years, over half of seniors fall annually and 45 percent of falls by older adults occur outside the home, the students say, citing statistics from the online fall prevention course Learn Not to Fall.

To test their project, the students asked anonymous users at the Alfond Arena's public free skate to wear the device while ice skating. The device detected all falls, but also some false positives based on movements such as spins, which the students have since worked to improve.

The students, who worked under the supervision of new media professor Mike Scott, received an initial grant to cover the cost of the prototype and are applying for a grant through the Maine Technology Institute to make improvements.

The students say future possibilities for the device include using smaller parts, adding GPS and more functions such as a walk counter, vitals detector or the ability to make phone calls.

Provided by University of Maine