Help! I Need Somebody: An Assistive Device That Notifies Emergency Services Once a Fall Has Been Detected

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36 million falls are recorded every year among the elderly population. 35,000 of those falls result in death. There are fall detection devices already available, but they are expensive and only detect falls 85% of the time. Those fall detection devices use an accelerometer and gyroscope to measure if a fall has occurred, rather than using vitals. They also do not directly call emergency services or emergency contact. Instead, they notify a 24/7 monitoring center and they make the call. I developed a device that utilizes two modules, an accelerometer and pulse oximeter. With these modules I set constraints that when exceeded a timer would countdown from 20 seconds. The user would have 20 seconds to press a button that would tell the timer to shut off and reset the device. If the button is not pressed within 20 seconds, a pre-recorded message is sent to the attached Bluetooth device through a Bluetooth module. The pre-recorded message would include information that might affect patient care, like the user's location, list of pre-existing conditions and medicines, and any allergies that could put the user at risk. By using data from a pulse oximeter and accelerometer modules, the device was able to accurately detect if a fall had occurred. The device looked for an extreme increase in heart rate and zero movement to detect a fall. This device could be utilized by older adults that are at risk of falling and still want to live independently.

Awards Won:

Arizona State University: Arizona State University ISEF Scholarship (valued at up to $58,000 each)