aWear: An Assistive Wearable System to Assist Nurses and Residents of Aged Care Homes

Torok, Mitchell (School: Rosny College)
Brain, Ivy (School: Launceston College)

aWear is an innovative assistive aged care system designed to support a rapid response to accidents, particularly falls. This potentially life-saving solution has been a collaboration between Mitchell Torok who is responsible for the physical hardware and Ivy Brain, responsible for the web server. To design the aWear system, we used an iterative design research methodology. We regularly visited a local aged care home and asked the end users of our system, the nurses and residents, to provide feedback on how they would use the device and what functions it would require. aWear consists of a wearable device that interfaces with a web server. The device was designed for residents to wear continuously, day and night. Following an increase in movement, two seconds of acceleration and gyro data is sent to the web server, along with location data accurate to 7 meters. Machine learning is used to determine the likelihood of a true fall, and improves as the system is used. Nurses are alerted via SMS or email, and can mark it as a true fall or false alarm. We evaluated the algorithm after collecting movement data on staged falls as well as everyday use of the device. With one possible threshold setting we were able to provide a 88.0% true positive rate with a 12.5% false positive rate. The aWear system has the potential to improve health outcomes and save lives by providing timely assistance to people when they need it.

Awards Won:
Fourth Award of $500