

S. HOLLOCK, N. JOHNSON, J. SIXSMITH. *A smart distress monitor for independent living*. *Gerontechnology* 2010;9(2):216; doi:10.4017/gt.2010.09.02.251.00

Purpose UK Government figures predict that the number of people over 65 in the UK will grow from 9m to 17m, and the number of over 85s will triple, by 2051. The number of people suffering from long term illnesses will increase by over 10% by 2020. As a major portion of hospital beds in the UK are already occupied by elderly people with fall related problems, this is a major problem. Similar, or greater, levels of growth are being predicted by countries in all parts of the world. The ability to reliably detect that a fall or other event causing distress has occurred will have a direct impact on hospital bed occupancy, as the time on the floor after a fall relates directly to the number of days spent in hospital. In this paper, we describe an affordable and accessible automatic monitoring and alert system to detect and locate vulnerable people when in need of assistance - in real time and without the need for positive action on their part. Being deployed in all private houses, nursing homes and hospitals, this user driven product, will make a significant contribution to the goal of helping the elderly, frail and infirm to retain their independence for as long as possible. Invasion of privacy will not be an issue because of the non-intrusive nature of the infrared technology.

Method The Smart Distress Monitor operates by tracking and monitoring an individual as he or she moves through a space, from room to room, detecting both falls and unusual behaviour through observation of activity or inactivity. The system is based on the unique Irisys, low resolution, infrared array technology, which can reliably locate and track a subject within it's field of view and provide location, size, and velocity information, allowing the status of a vulnerable individual to be analysed more rapidly and effectively than has hitherto been possible by any other approach. The system's principle mode of operation is to monitor target inactivity and compare it with a map of acceptable periods of inactivity in different locations in the field of view.

Results & Discussion The Smart Distress Monitor offers to provide a step change in performance over current assistive technology, which is generally based on devices which must be worn, or on single element PIR devices or other sensors such as pressure pads. Being both low resolution and infrared, there are no ethical barriers to the use of the Irisys technology in this application, as images appear as 'blobs'; this is in direct contrast to the only realistic alternative technology - CCTV systems which are intrinsically intrusive and ethically unacceptable.

References

1. Sixsmith A, Johnson N. A Smart Sensor to Detect the Falls of the Elderly. *Pervasive Computing* 2004;3(2):42-47

Keywords: fall detection, distress monitor, assisted living, independent living

Address: InfraRed Integrated Systems Ltd., UK; E: steve.hollock@irisys.co.uk