Smart Floor: Detecting Falls, Saving Lives

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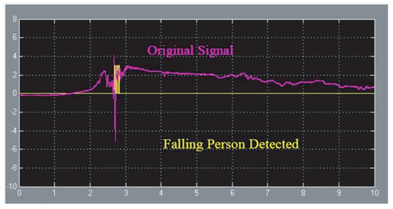
Introduction

For people over the age of 75, 70% of all accidental deaths are due to falls. When an elderly person falls at home, immediate action should be taken to determine the need for medical attention. As a solution, we propose a ubiquitous fall recognition system to alert an emergency medical service when necessary.

Background

Vibration Sensor



Alwan et al, University of Virginia Medical Automation Research Center

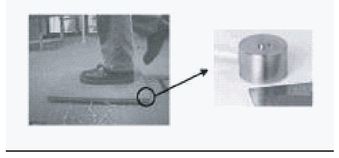
•Able to detect large spike in vibration- possible fall and filter out normal foot steps.

•Unobtrusive and is able to detect vibrations tens of feet away on carpet or wood floors.

Load Cell Sensor

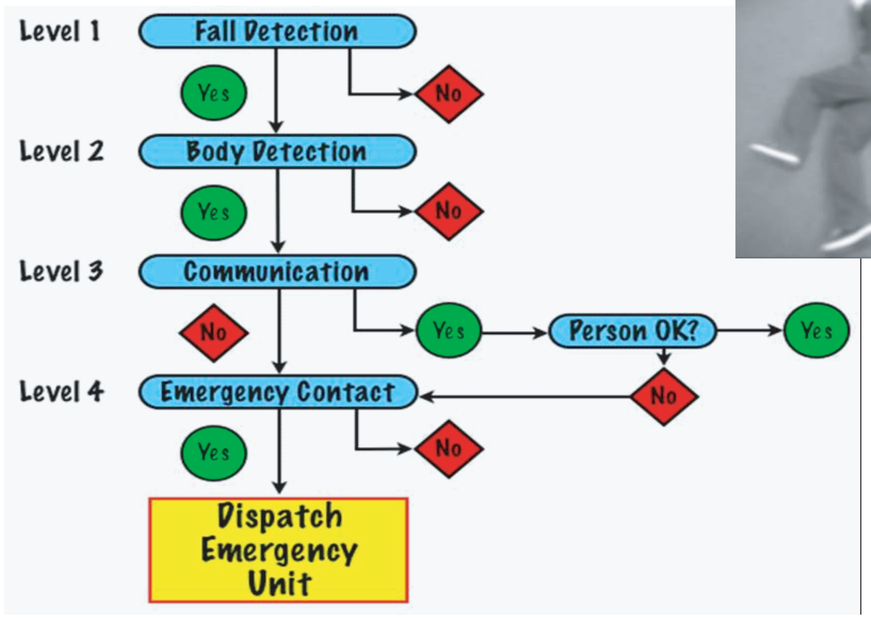
•Able to detect large or small mass in an area.

•Used to compare amount of time mass is present and how large the mass is.



Orr et al, Georgia Institute of Technology
College of Computing and GVU Center

Method



Level 1 A fall is detected by a *vibration sensor*.

Level 2 The system uses the *load cell sensors* to classify the mass on the floor.

Level 3 Through communication, the system determines if the person is okay.

Level 4 The system alerts an emergency medical service operator with an image and report of the detected mass. The operator dispatches an emergency unit if the mass is a body.

Future Work

We feel as though our research shows enough promise to merit further study. So far we have determined that the technology available to us is sufficient for the purposes of this project and that there is a need for a system like the one we are developing. Our next steps will include:

•Collaboration with the Georgia Tech Aware Home

•Acquisition of sensors for laboratory testing

•Investigation into possible improvements for our response system

•Cost analysis for real-world implementation