

Public Abstract

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Title: Design of a signal scavenging sensor system for passive monitoring in eldercare technology

This thesis describes sensors designed for a non-obtrusive monitoring system to detect and track the elderly adults walking on the carpet. The sensors are thin metal foils which detect environmental or scavenged energy. The technology aims at addressing the concerns of safety for the elderly under no supervision and without wearable-expensive-tracking devices. Eldercare technology provides support for the growing number of seniors in the world population. Emerging technologies are expected to ameliorate the problems of aging such as loss of balance and falls, causing a potentially serious injury.

The thesis investigates the variation in the power of the signal from the foil sensor after being touched or stepped utilized for sensing and detection applications. Characterization of the scavenged signal shows the dominance of the nuisance 60Hz energy. Change in the foil sensors dimensions and thickness showed significant variation in the signal detected. Sensor performance measures are made using a development board. Results show that foil sensors are reliable for detecting personnel and for tracking a movement. Thus, the foil sensors, through scavenged signals, can be utilized for passive monitoring.