

**Safety system for elderly wandering  
person**

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**Abstract:**

We have developed a new mobile phone-based safety support system for transmitting information of a wandering elderly person's location and the environmental sounds around that person. The system consists of a wearable sensor and a conventional desktop PC with Internet access acting as the server computer. The wearable sensor, which is attached behind the neck of the elderly person's shirt, is composed of GPS module. The wandering elderly person's location is identified within 100 m from the mobile phone company's antenna ID via the W-SIM. The caregiver sets the elderly person's movement area by specialized computer software. The GPS module sends both the wandering elderly person's location and the environmental sound to the server computer. The server computer informs automatically the caregiver by a message on the website. The caregiver can monitor the sound and the map of the wandering person's location via Internet.

**Introduction:**

In Japan, the 2010 population of elderly people over the age of sixty-five was about twenty-nine million, according to an analysis by the Japanese ministry of internal affairs and communications. Elderly people with dementia number two million and are expected to reach 3.5 million by 2030. Dementia is a long-term and progressive disease, and a normal lifestyle becomes difficult. They have many behavior disorders such as wandering, poor verbal communication and being uncooperative.

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Their wandering behavior is a major cause of death, so it is an especially serious problem for caregivers. It is therefore very important to monitor the wanderer's location and situation.

Numerous location detection systems have been developed. At present, there is a highly accurate elderly person location device which uses the Earth satellite-based Global Positioning System (GPS).

The GPS module system also can be used to detect the person's location. Numerous antennas, spaced every 100 m, are already installed by the telephone company. The location is identified within 100 m from the mobile phone company's antenna ID. The accuracy of the GPS system is considerably less than the GPS system; however, the GPS system cannot detect locations inside houses, other buildings, shopping arcades, underground shopping malls and in vehicles such as a car, bus or train. The developed wearable sensor employed the GPS can detect the person's location both inside and outside of buildings, and send the location to the server computer by the GPS. Also the wearable sensor can record the environmental sound around the wandering elderly person. This sound can be used to identify the accurate wandering elderly person's location and prevent an emergency situation, such as an accident. When the elderly person goes out of the area set in the sensor, the sensor automatically sends both the wandering elderly person's location. The computer informs the caregiver by the notification on the website. The caregiver can monitor the sound and the map of the wandering person's location via Internet and SOS will be available and also an RTC module is Technofist,

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used set the time of having tablets and an buzzer in the module make sound whenever the time comes to have an tablets if person din't take it. The module will send a notification on the website.

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