

# International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 1, Issue 8, October 2013

## A Survey on Health Care for Aged People Based on Sensor Network

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**ABSTRACT:** We Survey on welfare facility for elders based on sensor network. In recent days the number of people is increasing rapidly around the world and the situation is not going to easiness in the expected future. The wireless sensors which are used to detect usage of electrical devices, bed usage pattern, flow of water, and so on. The sensors provide information that can be used for monitoring the elderly by detecting any abnormality pattern in their regular activities around the home. The system will automatically generate and send an early warning text message to the care giver and relative's, when an unexpected abnormal condition occurs.

**Keywords:** Elder care, sensor network, Alert message or Alarm, Health monitoring.

### I. INTRODUCTION

In this world many old people are living lonely, they have much disease like memory loss, infirmity and fits and so on. Here we survey on elders care monitoring using sensors networks. A sensor is a converter that measures a physical quantity and convert's it into a signal which can be read by an observer or by an instrument. The sensor networks can be used for several application areas, the application are health care, military, home and so on. For different application areas, there are different technical issues, for this researchers are finding their solutions. The sensor networks are studied in this paper; here solutions are discussed related to elder's health care.

There were many people in our community, who because of mature, sickness, forgetfulness can no longer live in their home but, stay at monitored environment and give up their precious family situation. If these people want to live with their family they need constant monitoring, so that medical assistance can be provided immediately in the time of emergency. By the technology of today, there is a better way for these elder people to resolve this problem and then they can live with their family, instead of being compelled to stay in a monitored environment. Here we survey on home monitoring of elder's people, using wireless sensor network [1]. The goal of all the elder care based paper is to provide warning or alert message to care giver or relatives.

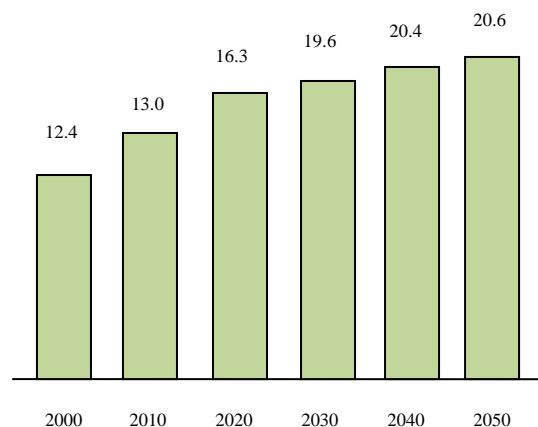


Fig 1. Population aged 65 and over–2000 to 2050. Sources: U.S. Census Bureau [1].

The structure of this paper is as follows. We review some of the literature survey on the elders care based on sensor network in section II. We summarize this paper in section III.



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## II. LITERATURE SURVEY

### A. COMPUTER VISION BASED ELDERLY CARE MONITORING SYSTEM

Mi-Suen Lee et al, (2003) [2] have proposed elders monitoring based on cameras. The input from many cameras is analysed by computers for doubtful events. If such event occurs, an alarm is raised and a controller sends the short message service (SMS) or text message to care giver and relative. If event not occurs the system will be quit [06]. The advantage is analysing the features of the person of interest and detecting at least one of an event and behaviour.

### B. ACTIVITY RECOGNITION IN THE HOME USING SIMPLE AND UBIQUITOUS SENSOR

Emmanuel Munguia Tapia, Stephen S. Intille and Kent Larson (2004) [3] have proposed elders monitoring based on simple and ubiquitous sensors. Those sensors can place anywhere in home, it can be used to detect activities of elders around the home. The main goals of this paper is the larger number of simple, low cost tape on and forget sensors are easily taped on objects throughout an environment. A computer that can automatically detect the user's behaviour could provide new context aware services in the home. The advantage of this system is that the sensor is easy to install in home and its least cost.

1) *Activity Detection Approach:* The design goals that motivates the activity recognition algorithms developed in this work are,

- Activity Detection Approach
- Probabilistic classification
- Model-based Vs instance-based learning
- Sensor location and type independent
- Real-time performance
- Online learning.

This system has three components they are,

- Environmental State-Change Sensors  
The information about environmental object is collected.
- Context-Aware Experience Sampling  
It is used by the end user to label his or her own activities.
- Activity Recognition Algorithms  
It is used to recognizing activities after constructing a model based on a training set.

### C. A PERVASIVE HEALTH SYSTEM INTEGRATING MONITORING, LOGGING, AND SHARING

Andreas K et al (2013) [4] proposed health care system based on body sensing devices. This sensor is used to monitor the heart rate, skin temperature, and activity.

1) *Patient Monitoring:* The heart rate, skin temperature and activity continues monitor through the deployment of various on body sensing devices. The wireless device can transmit the monitoring value to mobile phone. Then the mobile phone can transmit that value to care giver i.e. hospital. The monitoring value initialized by patient it's self or care giver. The system will generate appropriate alerts and feedback when the higher heart beat will monitored.

2) *Status Logging:* The option given to the elders or patients is called as status logging. A Patient to log their information for the concerning disease as perceived by itself. This information can be consider as subjective and corresponds to the following status descriptors,



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- Problems/Symptoms
- Activity
- Time and Location

3) *Social Sharing:* A patient can share their personal health information through text messages with their mobile phone, consisting of friends and relatives, care giver, and other patients. This information sharing enables the patients to obtain feedback or help, etc.

## D. ELDER CARE BASED ON COGNITIVE SENSOR NETWORK

Anuroop et al (2011) [1] have proposed elders care based on bed sensor. Here they used four flexi-force sensors that were placed under the bed legs. The sensors provide information that can be used for monitoring the elder people by detecting any abnormality pattern in their daily activities around the house. The system will automatically generate and send an early warning text message to the care giver, when an elder people have an abnormal condition.

1) *Description of the Developed System:* In previous days, camera based system for home monitoring system has been popular with the elder people monitoring. It is not suitable to keep on monitoring elders through the camera based system.

So they need an efficient method for constant monitoring. Hence Cognitive sensor is used for monitoring elders. In this paper they are using sensors for detecting usage in electrical appliance, bed, water and panic button.

1.1) *Monitoring Of Electrical Appliances:* The main reason of monitoring an electrical appliance is to know the regular use of electrical appliances in home. Here elders monitoring is based on the electrical appliances usage by old person in their daily activity. The electrical appliances could be microwave oven, television, electric lamp, and so on.

The sensor is placed between electrical appliances and micro controller, because the sensor provide the analog value, to converting this value to digital they using micro controller, the micro controller have a wireless transmitter. They used wireless transmitter for transmitting the data from micro controller to the system. The elder's regular activity data are collected and stored in database. The system has a receiver, after receiving the data from micro controller through transmitter; the data will be compared with collected data. If there is any huge difference between those two data the system will automatically generate the text message to care givers or relatives. If no difference then the system will be quit and waiting next data.

1.2) *Monitoring Water Use:* In this world water usage is essential for household purpose. The water use monitoring in house will provide a general overview of whether the elders is at home or not and when he is using water. Here they use flow sensor for monitoring water use. A flow sensor is a device for sensing the rate of fluid flow. It uses flow meter for sensing the fluid.

The flow sensor placed after the incoming water pipe. The flow sensor can place at home in kitchen, shower, washing machine, washbasin, and so on. The sensor placed after the water pipe, then that is connected to micro controller. The micro controllers have a wireless transmitter for transmitting the data. The system receives the data using receiver when the micro controller transmits the data. The received data compare the collected data from data base for monitoring how long the water is used. If there is any huge difference between those two data, then the system will automatically generate the text message to care giver or relatives. If no difference then the system will be quit and waiting for next data.

1.3) *Monitoring Bed Use:* The bed monitoring system is used to monitor the elder people sleeping pattern and bed usage. This sensor is mostly used for monitoring old people and disable who lives lonely at home. Here they use flexi force sensor for monitoring purpose. A flexi force sensor is ultrathin and flexible printed circuits, which can be used for force measurement applications.



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The flexi force sensors are placed under the bed's legs. The flexi force sensor is connected to a microcontroller (MC) because the sensor provides only analog value for converting analog to digital by using MC. The MC need 2.5v to 5.5v DC for that, AC to DC converter is used. The converter has a step-down transformer for converting 230v to 12v AC converting and rectifier for converting AC to DC and filter for filtering the noise and regulator for providing constant current.

The MC receives the data from sensors. It includes ADC for converting analog to digital signal. After converting, the signal will be transmitted with the help of ZigBee wireless transmitter. The ZigBee is a specification for a suite of high level communication protocols, used to create Personal area network. It ranges from 10m to 100m. The elder's regular activity data are collected and stored in database. The controller system receives the digital signal from MC. After receiving the data from controller system through transmitter, the data will be compared with collected data. If there is any huge difference between those two data, the system will automatically generate the text message to care givers or relatives. If no difference, then the system will be quit and waiting next data. The main advantage of this paper is constant monitoring.

1.4) *Panic Button:* A panic button is used for emergency or an urgent assistance. It is an option to old people for emergency. It has very high priority among all other sensor. The controller sends the text message to care giver or relative, when the panic button is activated by elders.

1.5) *Cellular Modem:* The cellular modem is used for passing the text message from system to mobile phone. Here they used Wavcom Wismo modem. The cellular modem receives commands from the supervisory program running on the personal computer.

### III. CONCLUSION AND FUTURE WORK

In this paper we made a detail survey on health care for aged people based on sensor network. A vision based elder care system plays the effective role in health care, because monitoring through camera is a good option for monitoring elder's regular activity. And then we made detailed survey on how ubiquitous sensors system used in health care. A pervasive health system is used for effective monitoring and log status as well as social sharing. Finally, we survey on elder care based on cognitive sensor network system. The cognitive sensor network system provides the constant monitoring for elder's regular activity. So this system can easily detect the elder's normal or abnormal condition. Our future work is to concentrate on cost effective usage of sensor networks.

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