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Android Based Health Monitoring System for Elderly People

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***Abstract*---** In this paper, we develop android smart phone application to assists elderly people for independent living in their own homes. It reduces the health expenditures and burden of health care professionals in care facility units. It facilitates the care giver assistant by tracking the elderly persons in their own homes and avoids certain accidents. Furthermore, it also helps the family members to track the activities, when they are outside from homes. In the EXISTING SYSTEM, there should be some Care Taker along with the Patient who personally monitor the Age Old Patients. In the PROPOSED SYSTEM, Smart home is regarded as an independent healthy living for elderly person. This is used to Track the Patient's Activity along with the Remainders of Medicines, Food and other Activities. MODIFICATION that we propose is to monitor the Heart Beat of the Patient to find the normal functionality of the Patient along with IR based Tracking Solution at every room.

I. INTRODUCTION

The emerging demographic change towards an ageing population is introducing drastic changes into our society. Nursing homes and care facility units are renowned solution for elderly people. A person who lives in these units becomes depress due to lack of independence. Aging society demands a reliable solution to stay active for a long time, prevent social isolation and assistance for performing daily life activities independently in their own homes. [2] The advancement in wireless and ubiquitous technologies offers a unique opportunity to create pervasive environment and applications to support elderly people. Smart home is conceived as one strategy to provide a level of independence at homes and improve their quality of life. It provides a platform to reduce the health expenditures and burden of health care professionals [1].

In both developed and developing countries, numbers of Smartphone users are increasing day by day.

Smartphone runs a complete operating system and provides a platform for application developers and users. Google Android is one of the most competitive markets due to its open source platform. Hundreds of applications have been developed ranging from the interactive games to healthcare domain. Especially the medical domain applications enable the users to interact with the system to provide real time user assistance and help to improve the people life's style.

II. EXISTING SYSTEM

In the *Existing System*, there should be some Care Taker along with the Patient who personally monitors the Age Old Patients. Also if their conditions are abnormal, then they will suffer a lot. That also causes more problems. Also in this system the patient will not gain any confidence rather the presence of the care taker will remind them they are still sick. The psychologist says this have to be avoided to make the patient to recover from illness. Doctors says that the medicine will heal only half of the illness and the confidence only will heal them completely [2].

III. PROPOSED SYSTEM MONITORING

In the *Proposed System*, Smart home is regarded as an independent healthy living for elderly person. In this paper, we develop application to assists elderly people for independent living in their own homes. In the *Modification* that we propose is to monitor the Heart Beat of the Patient to find the normal functionality of the Patient along with IR based Tracking Solution at every room. Also if the patients conditions are abnormal an alert will be send to the relation, doctor's mobile and also to ambulance

A) Wireless Transmission:

In this proposed system, we have implemented the communication between sensors and monitors in the remote location throw xbee device. This will share the reading to the node with in 1 kilometer as possible. The system also falls under Tele-medicine where there is no requirement of patient to visit the hospital for regular check-ups.

B) Working Principle

Basically this system consists of three modules:
The first module is the **health monitoring system**, we are using wearable sensors to monitor the following conditions: the heart rate, body temperature and blood pressure with interface this with an node at home.
The second module is that the **activity monitoring system**,we use IR sensor for the obstacle avoidance and an reminder system to remind the aged to take their medicine and food on appropriate time.
The third module is the **communication with the remote monitor** of the aged people's health, for this we use xbee device with its interfaces to transfer by this datas collected from the sensor boards will transmit to the nodes which are about one kilometer long.[3] The architecture diagram of the proposed system is given in Fig. 1.

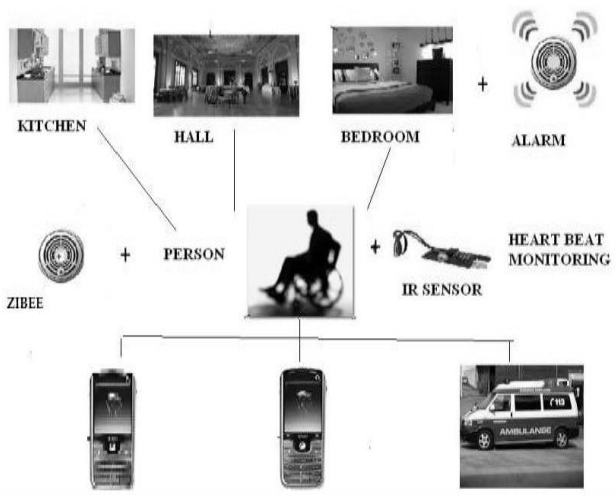

Fig. 1 Architecture Diagram of the Proposed System

IMPORTANT COMPONENTS

A) Ardunio:

Fig 2. Ardunio UNO board

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino senses the environment by receiving inputs from many sensors, and affects its surroundings by controlling lights. ARDUINO SOFTWAR, can tell your Arduino what to do by writing code in the Arduino programming language and using the Arduino development environment. The sample Ardunio UNO Board is given in Fig. 2

B) XBEE:

In the proposed System, XBee is used as a radio system. XBee is the brand name from Digi International for a family of form factor compatible radio modules.
The first radios were introduces under the MaxStream band in 2005 and were based on the 802.15.4-2003 standard designed for point-to-point and star communications at over-the-air baud rates of 250 kbit/s. Two models were initially introduces a lower cost 1mW XBee and the higher power 100 mW XBee-PRO. Since the initial introduction, a number of new XBee radios have been introduced and all XBees are now marketed and sold under the Digi brand.

The XBee radios can all be used with the minimum number of connections – power (3.3 V), ground, data in and data out (UART), with other recommended lines being Reset and Sleep. [5] Additionally, most XBee families have some other flow control, I/O, A/D and indicator lines built in. Fig 3 shows the sample XBEE device

C)Advantages of the System

- Provides the independent living for elderly person on their own base.
- Reduce the burden for the care takers.
- Improvises confidence on their wellbeing.

Figure-3: XBEE Device

IV HARDWARE SETUP AND EXPERIMENTATION RESULTS

The hardware setup of the device is given. The experimental result of the system is given in fig 4

The experimental result on the android phone is given in Fig. 5 and Fig. 6. The experiments are constructed to monitor the Heart Beat. The results of the concerned person Heart Beat can be viewed either in the Computer Interface or in the registered Mobile Phone. The device will be useful for Doctors' in order to monitor their patients' heart rate.

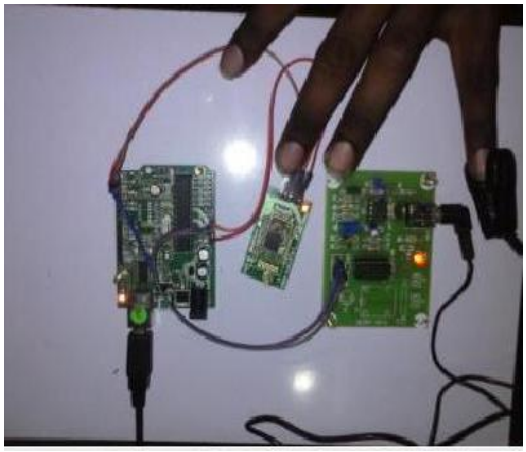

Fig. 4 Proposed System Setup

Fig 5. Result in Computer Interface

Fig 6. Result in Mobile Phone

The benefits of monitoring the heart beat rate are:

Safety. The heart rate is a gauge by which to assess the intensity of exercise to make sure that we are not overexerting or overextending our self. For example, if the heart rate is above the working heart rate range, it means it has to be slow down a little.

Effectiveness. If the heart rate indicates that we are not working hard enough, then we can work harder to maximize the effectiveness of the exercise. To maximize the effectiveness of aerobic exercise, we need to stay in the working heart rate range for at least 20 to 30 minutes continuously.

Incentive. By monitoring the heart beat rate from week to week, we can gradually exercise at a higher level of intensity, but at the same or lower heart rate [6], [7].

The following table provides the heart beat rate chart for all the humans.

Table 1: Heart Beat Rate Chart

Age	18-25	26-35	36-45	46-55	56-65	65+
Athlete	49-55	49-54	50-56	50-57	51-56	50-55
Excellent	56-61	55-61	57-62	58-63	57-61	56-61
Good	62-65	62-65	63-66	64-67	62-67	62-65
Above Average	66-69	66-70	67-70	68-71	68-71	66-69
Average	70-73	71-74	71-75	72-76	72-75	70-73
Below Average	74-81	75-81	76-82	77-83	76-81	74-79
Poor	82+	82+	83+	84+	82+	80+

V. Conclusion

To provide mobility for tracking the daily life activities, Smartphone is a convenient and suitable device due to its rich functionalities. In this paper, we have utilized the smart phone and smart home that may help to reduce the demands on elder's attentions and effort while performing daily life activities. It generates separate alerts for incomplete critical, stable, scheduled and overlooks activities for elderly persons. List of subscribed elderly persons, their last completed activities and alerts for critical situations are generated for care givers and family members. Our application is well integrated with smart home environment and hospital infrastructure.

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