



Research and Design of the Intelligent System of Care for the Elderly Based on the Internet of Things

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ABSTRACT

The design of the system for the care of the elderly is based on the technology of the Internet of things for the elderly with a specially designed powerful intelligent monitoring system, and a highly flexible, multi-protocol SOC nrf51822 as the processing unit, combined with peripheral equipment, including a gyroscope, acceleration meter, temperature, heart rate sensor, etc., The system gathers and analyzes the statistics of the sensor data, measuring the elderly person's body temperature, heart rate, amount of exercise, posture and other monitoring data. In case of an emergency, it can automatically call for help. The system has the advantages of convenience and ease of use, and provides a portable mobile monitoring station for the elderly.

Keywords: NRF51822, Automatically call for help, Posture.

1. SYSTEM OVERALL DESIGN

With the development of networking technology, wearable devices are gradually introduced into the medical field, and can provide a safeguard for people's physical and mental health. As contemporary college students should stand in the forefront of development, and grasp the most advanced knowledge of modern science and technology, for the benefit of society. The population of China has seen the emergence of the phenomenon of aging, with the number of elderly people in China reaching more than 200 million people by the end of 2015, according to statistics. Some of the elderly, because of their children going out to work, are left unattended or in understaffed nursing homes. It sometimes occurs that elderly people fall or die due to disease while no one discovers the cause of death. This technology based on the Internet of things for the care of the elderly care, can help to avoid a tragedy caused by no one finding an elderly person in time.

The system design, as shown in Figure 1, includes the main control NRF51822 which is responsible for the collection and transfer of data and user interaction. The mobile terminal APP uses low power Bluetooth and NRF51822 communication, and is responsible for sending text messages and emergency dialing functions. The OLED is responsible for the display of time, call reminders, SMS alerts and heart rate and body temperature values and other functions, combined with a vibration motor to remind the elderly users in a timely manner. The heart rate sensor and temperature sensor are respectively responsible for collecting the data of heart rate and body temperature of the elderly in a non-contact type. The gyro and acceleration sensors are responsible for real-time monitoring of the user's action status, which in the case of sudden fall can automatically notify the monitoring center or their families.

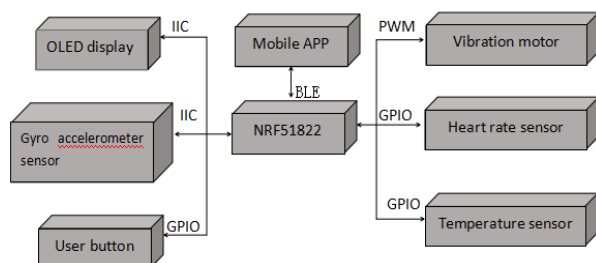


Figure1. System design

2. UNIT MODULE DESIGN

2.1 Attitude detection unit design

The design for attitude detection of the elderly person integrates the 3 axis MEMS gyroscope, 3-axis MEMS accelerometer and a can be telescopic digital motion processor DMP available in a IIC interface connected to a third-party digital sensor. Nrf51822 is the core of the control MPU6050 system and can directly control this working state and data acquisition. The data is collected by the MPU6050 processor and then goes through the BLE to send to the phone. The circuit structure for communication of the NRF51822 and MPU6050 through the IIC bus interface is

