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# METHODS TO MONITOR REMOTE SLEEP AND MEDICAL ALARM SYSTEM

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**Abstract:** The monitoring of sleep quality and the transmission of alarm signals in accordance with the condition and the acute disease fall under the purview of fundamental sleep research and disease outbreak forecasting. The system has monitoring and analysis features.the physiological features of the sleeper pulse, the embedded A computer can determine whether a sleeper has an acute illness (such as heart disease, cerebral haemorrhage, etc.). If so, the wireless warning signal is sent by the wrist pulse monitoring gadget. When the alarm is received by the bedside wireless receiver, it can send an alert sound or call. The warning sound can specifically alert local musicians to the sound of the phone alarm can notify the appropriate personnel and issue an alert using the predetermined phone number.let the 120 emergency centre know.At the same time, the bedside wireless remote devices open the door to wait for the arrival of emergency personnel.The system can respond when sudden acute illnesses strike at night.efficiently address the patient's urgent medical needs and establish the prerequisites for the patient's quick treatment.

**Keywords:** Remote alarm; wristband;sleep monitoring ;Emergency; embedded system; pulse monitoring Treatment.

## I. INTRODUCTION

Sleep is a crucial physiological process that allows the body, especially the central nervous system, to rest and be repaired. by snooze Humans are capable of eradicating exhaustion, regaining mental muscular fortitude. Following slumber, people can Continue to be alert, and enhance your functioning and efficiency of learning. If the sleep is interrupted, it will immediately impact our lives, our job, and even bring about disease. within the long-term case. Thus, it is clear why it is crucial to a sound slumber. Getting enough sleep is crucial and essential element of health and essential to a fit life. Sleeping takes up one-third of a person's life, which is the innate behaviour of living things, including the importance of preserving ethnic diversity and individual resiliency. But individuals can diseases that might easily rupture while you're asleep, such as cardiovascular, cerebral thrombosis, stroke, respiratory asphyxia, and other conditions. Acute myocardial infarction affects an estimated 200000 people in the United States.37500 persons died suddenly from infarction and the evening every year. 20 years after a myocardial infarction,15% of sudden cardiac deaths happened in the period between the hours between midnight and 6:00 in the morning,illnesses frequently strike while people are sleeping, and Patients can never communicate when they are unconscious.have prompt medical attention. There are plenty currently.available medical alert call systems, although they are Only used when the disease suddenly attacks and the patients are conscious, the alarm signals are sent by the patients.Instead, there is no sort.a system of automatic medical alarm call, which is used while unconscious.

Long-term outcomes demonstrate that the sleep issues have the tight ties between cardiac disease and high blood pressure illness, diabetes, and other conditions, the quality of sleep considerable effects on the human neurological, endocrine, and circulatory systems, among others. Using the raising humankind's living conditions and due to the advancement of medical knowledge, sleep issues already brought to the medical professional increasingly attentions. Analyzing and monitoring sleep quality have already established themselves as key connections to determine a person's level of health and to avoid connected illness research is also being done in the area of sleep.also extremely important.

The arterial pulse wave is a synthesis of the blood flowing waves brought on by cardiac ejection and the pressure waves brought on by vein."Information source" that is natural. Through examination of vascular pulse wave, we are able to gather some important information that is pathological. In today's world, with the raising of people's standards of living and the transformation the mortality and morbidity rates of dietary structure of heart disease, as illustrated by Atherosclerosis is becoming more and more prominent. World The World Health Organization already considers it to be the first a murderer who poses a substantial risk to human health in the 21st century. thus, how can you prevent and Curing these illnesses has become a crucial concern that It is vital to find solutions for every country in the world.

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## II. METHODOLOGY

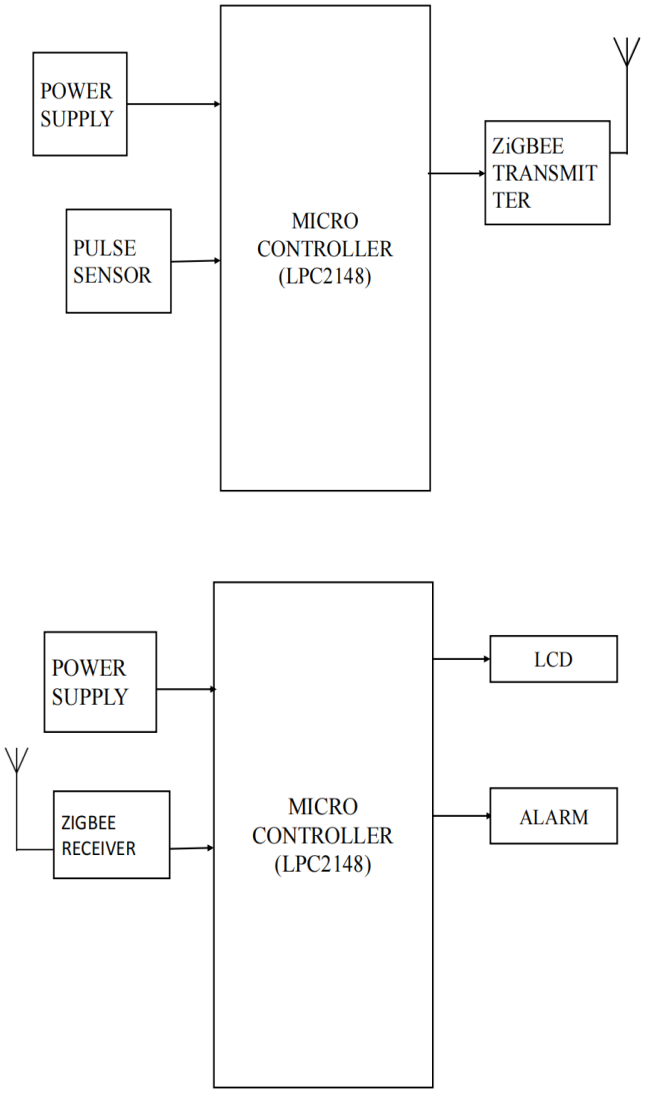


**Fig 1.** Block Diagram.

Humans may erase exhaustion and regain their mental and physical vigour by resting, and they can also maintain their health by sleeping.a good level of alertness that will enhance working and learning efficiency .If the sleep is disrupted, it will immediately impact our employment, life, and even the sickness itself cause it. In this research, we measure the wrist pulse rate. If the heartbeat is if the pulse rate is abnormally high or low, it sends the sms using the gsm modem while also sending through the Zigbee receiver to the receiver and provides the alarm. If you wish to know a person's heart rate at any time, subsequently transmits the message to the GSM modem The pulse rate will be sent via modem as a message to the person.

## III. RESULTS

### HARDWARE DESIGN

The wrist pulse monitoring device, the bedside micro-controller, and the related circuit are the only components of the system. The components of the wrist pulse monitor are as follows: the wireless transmitter and embedded computer systems PT2262 circuit (1).The bedside microprocessor is a fitted with a wireless receiver and a power supply circuits PT2272(1) and PT2262, a wireless transmitter a micro controller (MCU 1), and (2).There is a WiFi network. the control door lock circuit and the receiver circuit PT2272 (2) close to the door.
In Fig. 2, the entire design structure is displayed.

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In Fig. 3, the circuit principle is displayed.

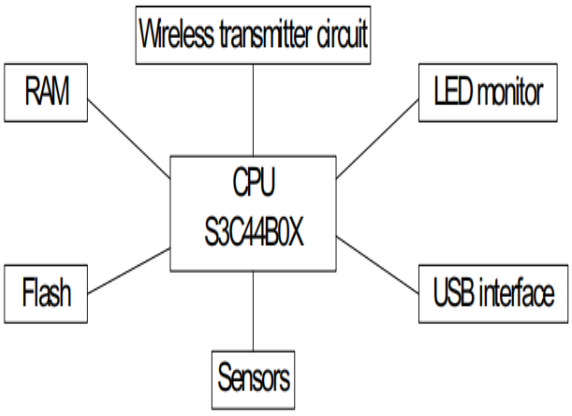


**Fig. 2** The whole design structure.

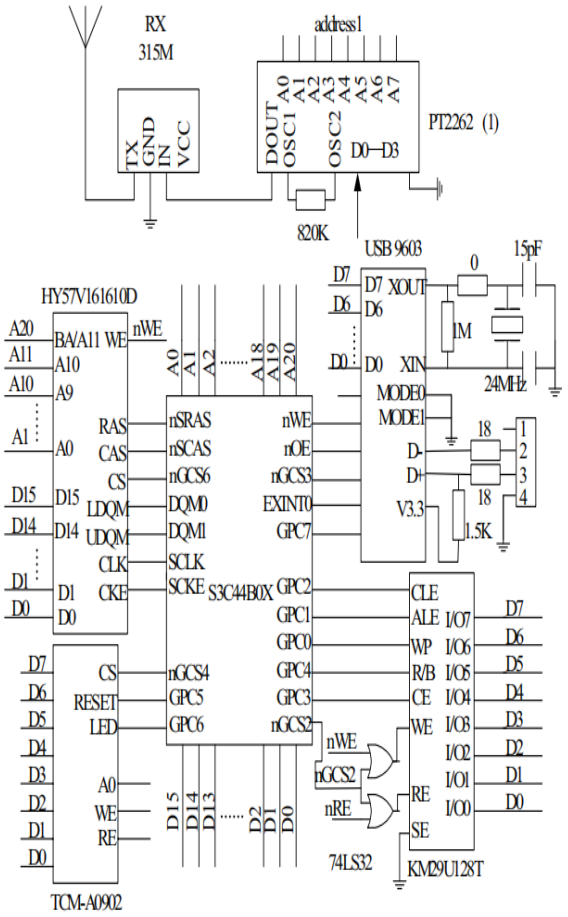


**Fig. 3** The circuit principle.

### *A. Pulse Sensor Selection*

The PVDF film pulse sensor is suited for many types of sensors that are unable to detect the pulse. There are significant constraints for pulse measurement, but numerous drawbacks in relation to a location. It can only send the pulse since it is a pressure sensor. signal the exact location of a body surface artery.Due of its extremely high sensitivity, it will have

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the human body's tiny motion signal is amplified It is simple to create the interference with random motion.The the sensor's copper metal casing immediately contacts It may generate the 50Hz frequency using the skin. interference, and as a result, the sensor's analogue signal The body surface pulse cannot be accurately reflected by output arterial fluctuation, the signal must be handled.

However, the experiment demonstrates that oil has viscous properties, making it challenging to conduct some weak transient fluctuations, which just played a part in low-pass filtering and anti-jamming. The Oil had a higher specific heat, and its temperature was not evident along with the external transformation, which strengthened wore loose clothing. Since it is thicker and more substantial Oil's inertia may have a certain barrier effect on unrelated objects. human skin causes disturbances and weakens pulses transmission. By applying this idea, we can get better. the pulse oximeter. The poll itself reveals that the degree of "strong" and "weak" signal attenuation was different In a period of change, it shows that the deviation of the morphology of the received pulse oscillogram's bottom, this issue software was used to rectify. Therefore, In this paper, the PVDF film pulse sensor is still in use.

### *B.Embedded Microprocessor*

A 32-bit, instruction-reduced, high-speed processor called S3C440X was created by Samsung Corporation and is based on the ARM7TDMI core. operating voltage of it is 3.3V, and the ARM7TDMI's operational voltage is only 2.5V, the chip has a very low power loss.using wearing-style products is convenient.

It is a primary system using Samsung S3C44B0X as the core. designing its auxiliary circuits, such as the power unit, the bias circuit component, the clock component, the reset component, and the components of the bus that connect to the extended memory, which include data bus, address bus, and control bus in most cases.

Memory subsystem expansion: the RAM component SDRAM-HY57V161610D, SDRAM-HY57V161610D, and its 16-bit data with a 2M storage capacity. Swift is employed as a procedure memory. utilized ROM The operating system, application software, and other data are stored in ROM using linear address storage (such as the 29F010).

### *C.Wireless Transceiver Circuit*

A generic low-power loss low-cost encoding and decoding circuit called the PT2262/2272 is made by Taiwan's Princeton Technology Corp. using CMOS manufacturing. Processes with 12-bit (A0-A11) and 3-state (the) capabilities Any terminal pin that is bare, then high, then low. 531,441 address codes are possible when using combinations. PT2262 the configured address may be a 6-bit(D0-D5) data terminal pin. and data code can be transmitted in serial form from the 17-For a wireless remote transmitter circuit, pin-it can be utilized. When an alarm is received, the PT2272 can activate. Calling the patient's relatives or the medical staff to alert them dependent, therefore the appropriate emergency response measures are quickly taken.

The coding signals sent by the chip PT2262 are a entire codon composed of address code, data code, and synchronization code. After receiving the signal, the decoder chip PT2272 twice checks and compares the address code ,then the VT pin sends the high level signal, at the same time the corresponding data pin also sends the high level If the sending button has been depressing , the chip PT2262 will be keeping a continuous emission. When the transmitter button is not depressed, the PT2262 is not connected to power, and its 17th pin is the low level, so the 315MHz high frequency transmission circuit does not work.

When the button is depressed, the PT2262 will get electricity to work, its 17th pin can send the modulated serial data signals. When the 17 pin is the high level the 315MHz high-frequency transmission circuit will oscillate and send the constant-amplitude high frequency signal. When the 17 pin is the low level, the 315MHz high-frequency transmission circuit will stop oscillating. Therefore, whether the high frequency transmission circuit will emit is completely controlled by 17-pin digital output the serial data signals that were modulated. The 315MHz high-frequency transmission circuit will oscillate when the 17 pin is at the high level and transmit the high frequency signal with constant amplitude. The 315MHz high-speed signal is generated when the 17 pin is low.The oscillating frequency transmission circuit will stop. In light of this, whether the high frequency transmission circuit 17-pin digital output fully controls will emit.

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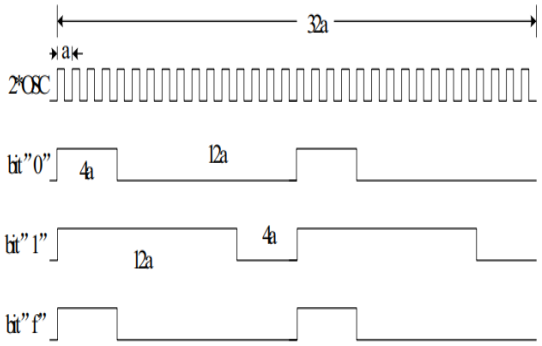


**Fig. 4** The trigger timing.

In Fig.4, which shows an intercepted waveform from an output pin with a super-regenerative module signal, the upper portion of the figure is clearly a collection of codes. A synchronization code separates each code from the next. Consequently, if we use a microprocessor to decode as long as the process determines that the synchronized then it is simple to determine the pulse width of the using the codes.

## SOFTWARE DESIGN OF PULSE MONITORING INSTRUMENT

At present there are three major programs in the embedded operating system generally: The first is that there is no operating system, the users directly control the hardware device in own application procedure, or manage hardware devices through some similar operating system's library document. This method is suitable to some small systems ' especially 8-bit machine systems and is also comparatively effective. But if system is complex, when there are many peripheral devices the management of them will be very troublesome. This kind of operating system is suitable for the system whose structure and the function is relatively unitary, whose storage capacity is smaller and whose user interface is almost few. The system has been a very wide range of applications in the industrial control field. But it has no way to be satisfied with the need of higher execution efficiency and storage capacity in the field of home appliance.

The second is to develop an operating system to fit the hardware by user. This has a rather high work load and is not very realistic.

The third is to eliminate the current, quite experienced operating and transplant it into the target system that is still forming. The majority of embedded systems use this technique. Comparing all of the factors thoroughly, we Recognize that the third is better for the system. For adopting a 32-bit S3C44B0X processor, the device itself support for a relatively established operating system. There are numerous prominent embedded operating systems available today. system available on the market, and the following are comparisons its purpose and to select the suitable operating systems used in this study.

### *(l) Windows CE.*

The Windows CE is a 32-bit multitasking operating system that can be transplanted and used to construct a variety of businesses and the Internet of Things. consumer electronics. since it forms the foundation of Microsoft's "Venus plans" includes Internet Explorer in its contents. and may understand the relationship, the synchronized using the Internet, exchange data. If programmers are they are accustomed to the Windows development environment may create a very effective integrated application process according to Windows CE. But the cost of its application is costly, in addition to costly copyright royalties, Certain fees must be paid for each application of It costs more because it is a product of this operating system. In Furthermore, since its source codes won't open, the Developers aren't allowed to haphazardly create their own procedures.

### *(2)Vxwork.*

The wind River system company created the high-performance, embedded, and real-time operating system known as Vxwork. It consists of the operative system. and incorporates the actual development environment. in light of Using a micro-kernel architecture, it also has many beneficial qualities like multi-processor support,rich network protocols are cutting-edge and compatible. simultaneously serves as a dynamic connection and download of the process. "Opportunity, MER-B" This operating system was deployed on the Mars rover in 2004. Vxwork has gained a lot of clients thanks to its great openness, honesty, promptness, and usability, but it additionally has to pay the pricey copyright royalties and the utilizing price.

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### *(3) µC/OS.*

Due to its compact design, great efficiency, and superior real-time performance, the µC/OS embedded real-time operating system has an efficient organizational structure. performance, many other kinds of organisms can easily adopt it. using a microprocessor. The small computers can use the µC/OS. The smallest kernel can be compiled to 2 k bytes. The process of designing the system to replace the once µC/OS has reached the desired hardware platform, extending the operating system performance based on actual needs including the underlying file systems and hardware drivers the user interface (GUI), among other things, in order to realistic RTOS. These ensuing developments are definitely not what we had hoped.

### *(4) Linux.*

Because Linux is a free and open server operating system, the business world has taken notice of its capabilities. Linux is also being used more and more in simultaneously running Linux on desktop PCs and workstations also develops into the ideal intelligent operating system due to its server-like characteristics, embedded devices OS. Currently, the development teams that research the Linux operating system, or research methods for creating There are a lot of embedded products on the network. every type of associated process and documentation are also very wealthy.

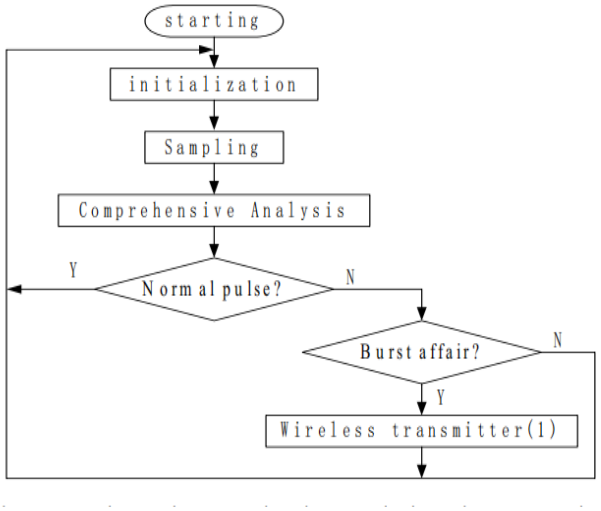


**Fig 5** The pulse-monitoring and alarming procedure flow.

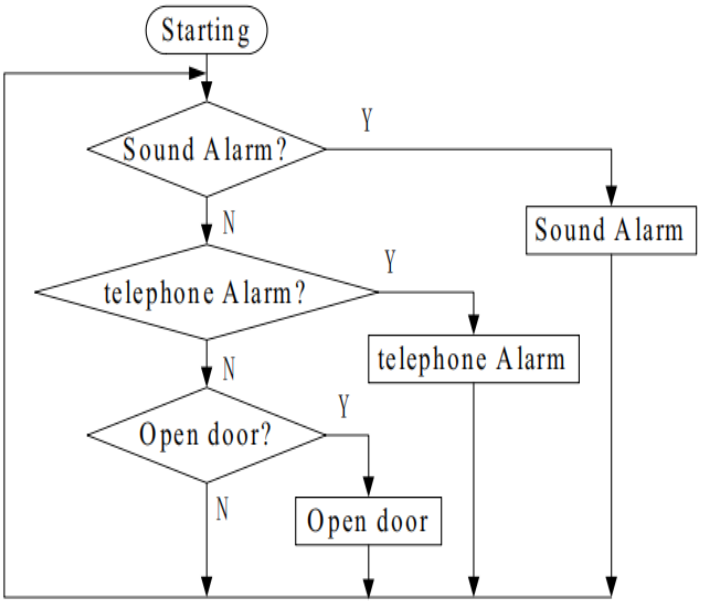


**Fig 5** The remote opening door control procedure flow.

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## IV. CONCLUSIONS

The system makes advantage of the superb embedded Linux operating system and related cutting-edge embedded hardware development techniques. tools for development it can quickly and successfully Informing the nursing staff of the user's odd behaviour pulse alteration, sending of telephone sound warning, and case of emergency. After the limited use, the entire system has a higher ratio of stability to speed to dependability. price and performance, therefore it will have a wide range of application potential in the information field combination.

This system's benefits include the ability to transmit "sudden A wireless signal travelling through the wrist indicating "acute disease" pulse-monitoring technologies, as well as to minimize the discomfort of connected by wires. the telephone or acoustic signals The bedside wireless receiving device alarm clock may emit a voice. By setting the phone number, I needed something that could simultaneously open the door and alarm 120 ambulances. So, using it is very simple.

## V. ACKNOWLEDGMENT

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