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Intelligent Medical Drawer for Patients

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Abstract – *Most of the people, from young age to the old age forget to take medicines on time. The elder people also forget which medicine to take at particular time. There should be a means to always remind such people to take medicines on time. This paper presents a Smart Medicine box to users who regularly take drugs or vitamin supplements, or nurses who take care of the older or patients. Our medicine box is programmable that reminds the nurses and users which specific pill to take at particular times of day and serves at those times each day.*

Key Words: ARM7, LM 35, Crystal Oscillator, Heartbeat sensor.

1. INTRODUCTION

We are connecting some patient monitoring sensors to monitor the health of patient con-tinuously.The patient data is sent to Doctor PC. On Doctor PC we are displaying the data, but it is difficult to manage so that's why the patient data is stored in intelligent medicine box. We are using EEPROM to store data. If any of the parameters exceed Normal set points then the doctor will update / change the Medicine and store in Medicine BOX. We are interfacing the fingerprint sensor to µc for security purpose.

2. PROPOSED SYSTEM

ARM7 LPC2148 Micro controller:

The ARM LPC2148 is a 32-bit microcontroller with real-time emulation and embedded trace support that combines it with embedded high speed flash memory ranging from 32 kB to 512 kB. A 128-bit wide memory interface and unique accelerator architecture enable 32-bit code execution at the maximum clock rate. For critical code size applications, the alternative 16-bit Thumb mode reduces code by more than 30 % with minimal performance penalty. Due to their tiny size and low power consumption, LPC2148 are ideal for applications where miniaturization is a key requirement, such as access control and point-of-sale. Serial communications interfaces ranging from a USB 2.0 Full-speed device, multiple UARTs, SPI, SSP to I2C-bus and on-chip SRAM of 8 kB up to 40 kB, make these devices very well suited for communication gateways and protocol converters, soft modems, voice recognition and low end imaging, providing both large buffer size and high processing power. Various 32-bit timers, single or dual 10-bit ADC(s), 10-bit DAC, PWM channels and 45 fast GPIO lines with up to nine edge or level sensitive external interrupt pins make these microcontrollers suitable for industrial control and medical systems. It also includes an in-built Real Time Clock (RTC) which plays the key role in our present application.

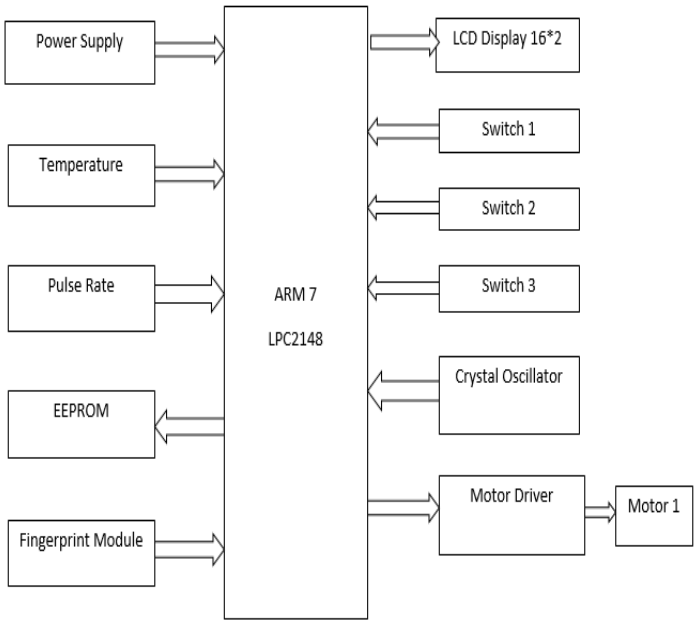


Figure 1.Block Diagram Of Intelligent Medicine Drawer

Liquid Crystal Display(LCD):

The 2 line, 16 characters LCD screen is used to display the instruction information, that the pills need to be taken now, and the current time and date.

Drawer model:

In the project we are building our own robotic Drwaer model which can move forward (Close) and Reverse (Open) using 2 separate DC motors.

Medicine box

The patient non-compliance is an important problem which places a prior importance to the health of millions of patients. The Medicine Box offers a solution to the patient noncompliance problem. The Intelligent Medicine Box keeps track the number and time of pills the patients have taken. This invention is therefore capable of improving patient's health significantly. The functionality of the medicine Box is based on a LEDs and a microprocessor keeping track of time and the number of pills left at several time in the Medicine Box The patient s schedule for taking his medication is also

stored. The Medicine Box uses this information to assume whether the patient is complying with his treatment The Medicine Box works in the following way:

1. The Medicine Box is filled with the prescribed medicine
2. The schedule for the medicine consumption is stored in it.
3. Each time when the patient opens the bottle, a counter counts the openings and stored
4. Each time a pill is taken, the Medicine Box will note the decrease in the number of the pills and use this information to mark the time the pill was taken and from counting the number of times the bottle is opened, the remaining pills calculate how many pills were taken.
5. The Medicine Box can remind the patient to take his medication. Further Medicine Box can send information using indications like light and sound.

The elderly are more likely to forget to take or fail to consume the medicine as pre-scribed. There are conditions like , user takes a wrong medicine, takes too much or too little of a definite medicine, receives the medicine at the wrong time, or adverse drug reactions/interactions happen with the possibility of causing death. According to the severity in each case, various levels of indications should be triggered. The iMedBox executes an intellectual analysis by automatically comparing the recorded medication time with the doctor's prescription. The alarm and the medicine name with the count will _rst show up on the iMedBoxs screen. The medication history is regularly uploaded and saved. The doctor can take it as a reference for the next prescription. By linking the wearable Bio-Patch with the iMedBox, the iHome Health-IoT system is capable of monitoring and analyzing the vital signs. The biosensor samples, such as ECG and body temperature, are digitized and wirelessly fed to the iMedBox, this data is stored, analysed, performs real-time signal processing and display. Based on the recorded ECG signal from sensors, the users heart rate information can be extracted, and a heart rate variability analysis can be performed on a regularly. Once a continuous abnormal heart rate is detected, it will automatically send out a text message to the doctor and emergency center.

3. EXPERIMENTAL SETUP

Patient Monitoring: Here we are connecting some patient monitoring sensors to monitor the health of patient continuously. If any of the parameters exceed Normal set points then the doctor will update / change the Medicine in flash magic software and stored. The medicine BOX will then change the medicines to be given.

Switches: Here we are using three switches for finger enrolled, finger successfully authentication and for edit message. Also one switch is used for reset system.

Fingerprint module: Here we are interfacing the fingerprint sensor to µC for security purpose. The medical box will open only when valid Finger print is enrolled. Since we are using a Biometric sensor it is highly secured.

Drawer model: In the project we are building our own robotic Drawer model which can move forward (Close) and Reverse (Open) using DC motors.

Liquid crystal display: A liquid crystal display (LCD) is a thin, at electronic visual display that uses the light modulating properties of liquid crystals (LCs). LCs do not emit light directly.

Programming code description: A compiler for a high level language helps to reduce production time. To program the LPC2148 microcontroller the Keil µv4 is used. The programming is done in the embedded C language or Assembly language. Keil µv4 is a suite of executable, open source software development tools for the microcontrollers hosted on the Windows platform. One of the difficulties of programming microcontrollers is the limited amount of resources the programmer has to deal with. In personal computers resources such as RAM and processing speed are basically limitless when compared to microcontrollers. In contrast, the code on microcontrollers should be as low on resources as possible.

Keil Compiler: Keil compiler is software used where the machine language code is written and compiled. After compilation, the machine source code is converted into hex code which is to be dumped into the microcontroller for further processing. Keil compiler also supports C language code. The compilation of the C program converts it into machine language file (.hex). This is the only language the microcontroller will understand, because it contains the original program code converted into a hexadecimal format. During this step there are some warnings about eventual errors in the program. If there are no errors and warnings then run the program, the system performs all the required tasks and behaves as expected the software developed. If not, the whole procedure will have to be repeated again.

Flash magic: Flash Magic is a PC tool for programming flash based microcontrollers from NXP using a serial or Ethernet protocol while in the target hardware. The baud rate is selected for the microcontroller and the registers erased before the device is programmed. If dumping process of the hex file is completed, then the controller will work as per our requirement.

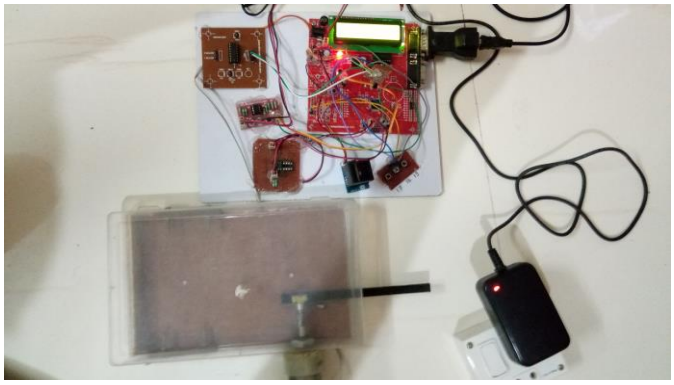


Figure 2.Experimental setup for intelligent medicine drawer for patient

Here we are using three switches for finger enrolled, finger successfully authentication and for edit message. Also one switch is used for reset system. We are using 9v power supply. User enter finger in fingerprint module. we are interfacing the fingerprint sensor to µC for security purpose. When patient take medicine then user enrolled finger in fingerprint module. The medical box will open only when and valid Finger print is shown. In the project we are building our own robotic Drawer model which can move forward (Close) and Reverse (Open) using DC motors.

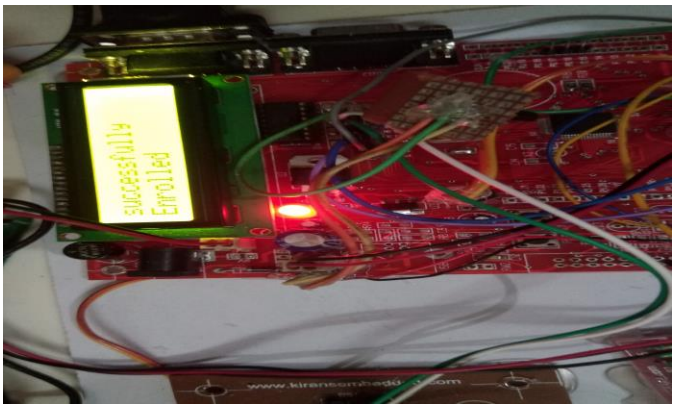


Figure 2.1 .Finger successfully enrolled

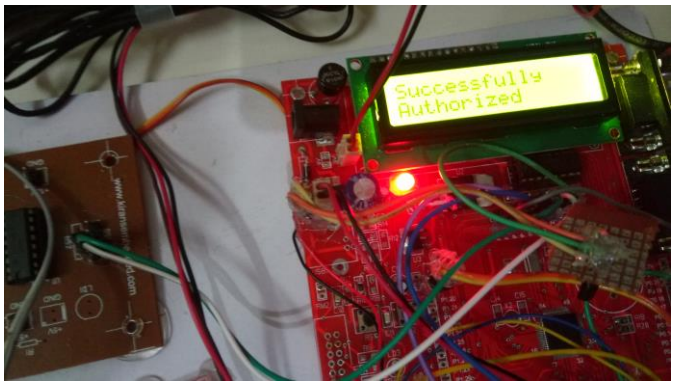
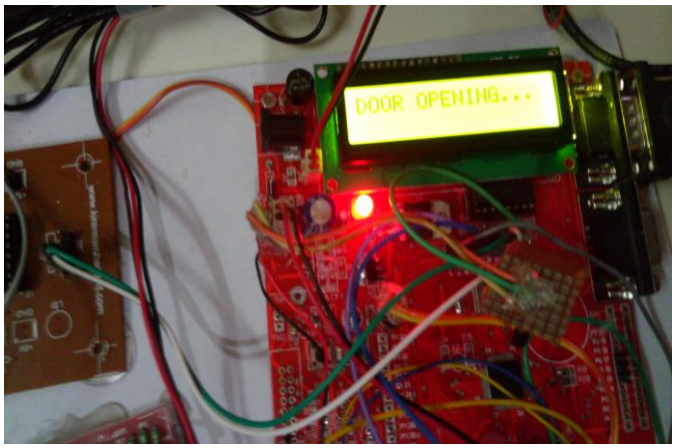


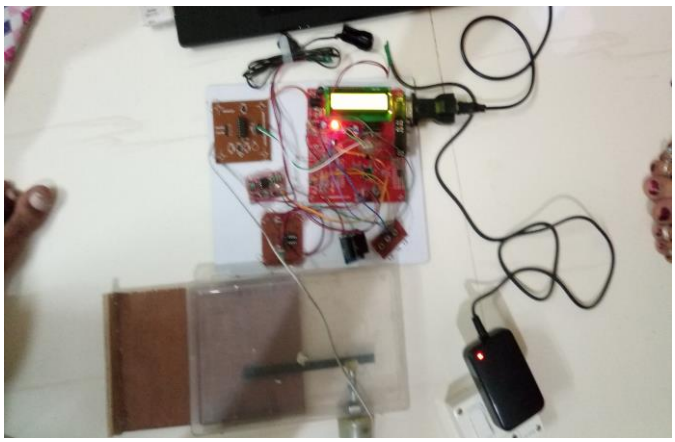
Figure 2.2 .Finger successfully authorized

4. RESULT

The result of the system is as shown

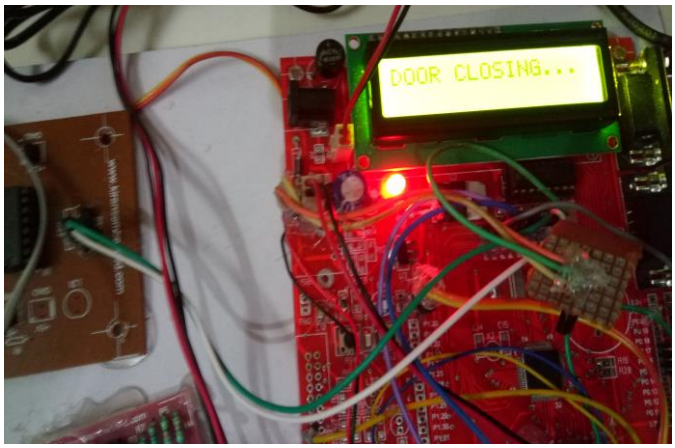


3(a)

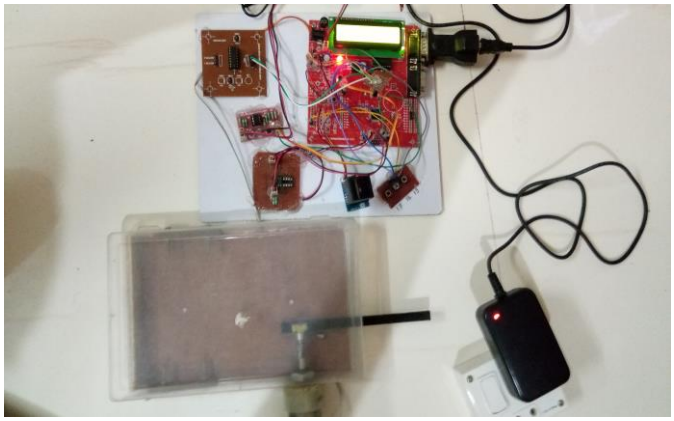


3(b)

Figure 3(a),3(b). The medicine drawer open



4(a)



4(b)

Figure 4(a), 4(b):The medicine drawer close

CONCLUSION

There is a great need for timely intake of medicines which is often skipped by many people. Our Smart Medicine Box helps to remind us to take medicines regularly and also which medicine to take. Thus this implementation, though small and simple, will be a very great and useful step in the eld of medicine.

REFERENCES

[1] Naga Udayini Nyapathi,“ Smart Medicine Box using ARM 7 Micro controller,” International Research Journal of Engineering and Technology, e-ISSN: 2395 -0056 ,Volume: 03.

[2] L. X. Geng Yang, \A health-iot platform based on theintegration of intelligent packaging, unobtrusive bio-sensor, and intelligent medicine box."

[3] Kasim M. Al-Aubidy, Ahmad M. Derbas. & Abdullah W. Al-Mutairi,“ Real-Time Patient Health Monitoring and Alarming Using Wireless-Sensor-Network”, 2016 13th international multi-conference on systems, signals & devices.

[4] K. C. et al, \Future delivery of health care: Cyber care," IEEE Engineering in Medicine and Biology Magazine, vo1. 27, no. 06, pp29 38, Nov-Dec 2008.

[5] L. Z. Z. Pangab, Q Chenb and E. Dubrovab, \An in-home medication management solution based on intelligent packaging and ubiquitous sensing," IEEE explore, ICACT,pp 545 550, Jan 2013.

[6] A. Hande and E. Cem, \Wireless sensor networks for healthcare:asurvey," Comput.Netw., vol. 54, no. 15, pp. 26882710, Oct. 2010.

[7] Priyanka A. Deshmukh, “Intelligent Medication System”, International Journal of Research in Advent Technology, Vol.3, No.10, October 2015, E-ISSN: 2321-9637.

[8] Sonam V Maju,“ A Health Iot For Patient Monitoring With Bio-Sensors And Intelligent Medicine Box”,Global Journal of Engineering Science and Research Management,ISSN 2349-4506