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Advance Medication Scheduler for Patients Using IOT

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ABSTRACT: Digital pill is basically a multichannel sensor used for remote biomedical measurements using micro technology. This is used for the real-time measurement parameters such as temperature, Heartbeat, IR sensors. This project proposes a smart pill with remind and consumption function. Which is used to give alert the user to take pills at a particular time and the pills required to take at that time comes out to the user to avoid confusion among medicines. This project proposes a smart pill with remind and consumption function. Which is used to give alert the user to take pills at a particular time and the pills required to take at that time comes out to the user to avoid confusion among medicines. The Smart pill box can reduce elderly family member's responsibility towards giving the correct and timely consumption of medicines. This system Getthe feedback about pills from the user and Send Details to Cloud.

KEYWORDS: AtMega328, ESP8266, ULN2003DRIVER, IoT

I. INTRODUCTION

Assistive care area has become an important field in medical sciences. World Health Organization (WHO) defines Assistive Technology (AT) "As systems and services related to delivery of assistive products that enables people to live healthy, productive, independent, and dignified lives, and also able to participate in education, the market labor and civic life". Elderly, those aged 60 or above, make important contributions as family members, active economy participants, volunteers, etc. Though some people aged well, many other become frail and some of them at risk of disease and a costly dependence. Particularly, dementia and cognitive disorders have become a common health problem of elderly people. This is due to the natural aging which increases chronic diseases. Those health problems require dosages of drugs, which could be supplied many times on a day.

II. PROPOSED SYSTEM

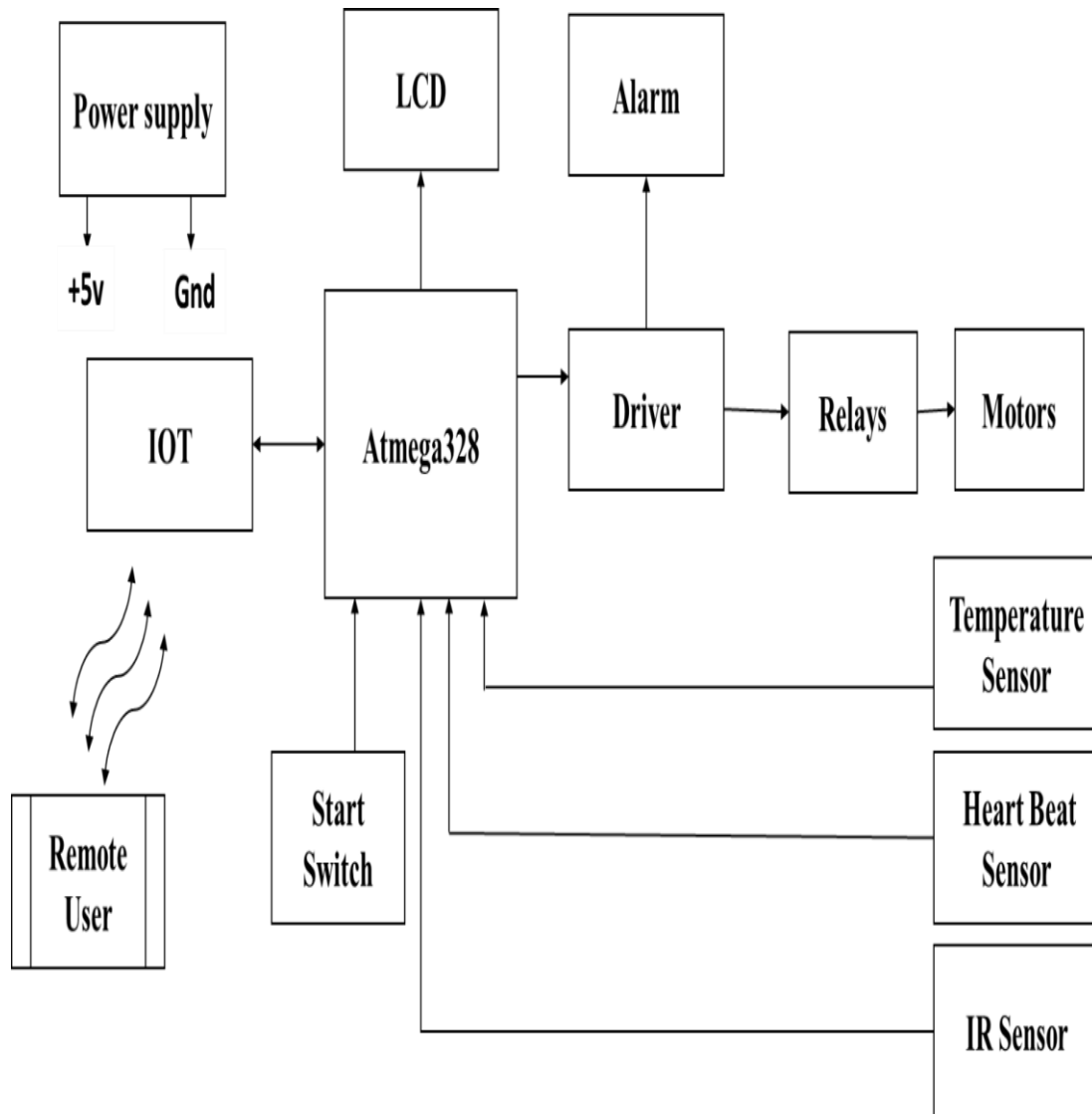
- Here we introduce a smart medicine reminder system based on IoT. The proposed scheme was particularly created for the IOT platform.
- For our system, we implement a reminder system which provides an alarm when it is time for taking medicine help of pill box mechanisms.
- The device setup consists of an IoT enabled pill box having multiple compartments, each having a lid to open, and an IR sensor attached to it. The system of pill box includes IR sensors for observation and reported the state of medication, that frequently checks whether the medicine is taken or not.
- Whenever the medication is loaded into the pillbox it'll be updated the medicine data and saved in database. The Arduino device fetches real time data and sends it to the application.

HARDWARE DETAILS

ATmega328 is an 8-bit and 28 Pins AVR Microcontroller, manufactured by Microchip, follows RISC Architecture and has a flash type program memory of 32KB. It has an EEPROM memory of 1KB and its SRAM memory is of 2KB. It has 8 Pins for ADC operations, which all combine to form PortA (PA0 – PA7). It also has 3 built-in Timers; two of them are 8 Bit timers while the third one is 16-Bit Timer. You must have heard of Arduino UNO, UNO is based on atmega328 Microcontroller. It's UNO's heart. It operates ranging from 3.3V to 5.5V but normally we use 5V as a standard. Its excellent features include the cost efficiency, low power dissipation, programming lock for security purposes, and real timer counter with separate oscillator. It's normally used in



Embedded Systems applications.



BLOCK DIAGRAM

WI-FI MODULE (ESP8266)

The ESP8266 Wi-Fi Module is a self-contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your Wi-Fi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor. Each ESP8266 module comes pre-programmed with an AT command set firmware, meaning, you can simply hook this up to your Arduino device and get about as much Wi-Fi-



ability as a Wi-Fi Shield offers (and that's just out of the box)! The ESP8266 module is an extremely cost effective board with a huge, and ever growing, community.

TEMPERATURE SENSOR

Temperature sensors are devices that detect and measure coldness and heat and convert it into an electrical signal. Temperature sensors are utilized in our daily lives, be it in the form of domestic water heaters, thermometers, refrigerators, or microwaves. There is a wide range of applications of temperature sensors, including the geotechnical monitoring field.

HEART BEAT SENSOR

A person's heartbeat is the sound of the valves in his/her's heart contracting or expanding as they force blood from one region to another. The number of times the heart beats per minute (BPM), is the heart beat rate and the beat of the heart that can be felt in any artery that lies close to the skin is the pulse.

IR Sensor:

Infrared radiation is the portion of electromagnetic spectrum having wavelengths longer than visible light wavelengths, but smaller than microwaves, i.e., the region roughly from $0.75\mu\text{m}$ to $1000\mu\text{m}$ is the infrared region. Infrared waves are invisible to human eyes. The wavelength region of $0.75\mu\text{m}$ to $3\mu\text{m}$ is called near infrared, the region from $3\mu\text{m}$ to $6\mu\text{m}$ is called mid infrared and the region higher than $6\mu\text{m}$ is called far infrared. (The demarcations are not rigid; regions are defined differently by many).

Working of ULN2003 IC:

The ULN2003 IC consists of eight NPN Darlington pair which provides the proper current amplification required by the loads. We all know that the transistors are used to amplify the current but here Darlington transistor pairs are used inside the IC to make the required amplification.

OPERATION OF ELECTROMAGNETIC RELAY

Relays are usually dc operated. When dc is passed to the coil, the core gets magnetized. The iron armature towards the core contacts 1 and 2 open and contacts 2 and 3 close. When coil current is stopped, the attraction is not there and hence the spring tension brings 1 and 2 to closed position, opening the other set 2 and 3.

DC MOTOR

The direct current motor or the DC motor has a lot of application in today's field of engineering and technology. Starting from an electric shaver to parts of automobiles, in all small or medium sized motoring applications DC motors come handy. And because of its wide range of application different functional types of dc motor are available in the market for specific requirements.

The types of DC motor can be listed as follows

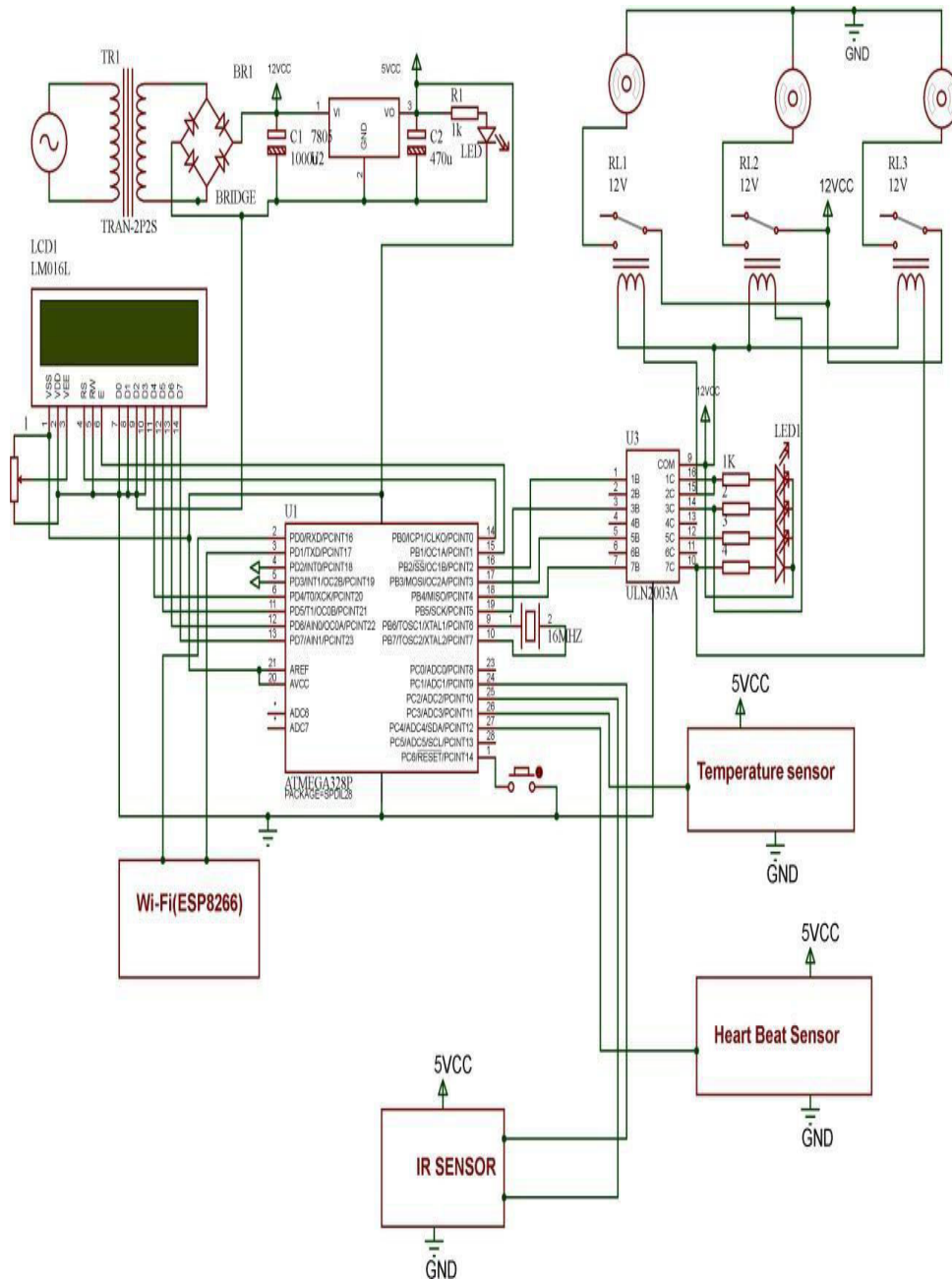
- DC motor
- Permanent Magnet DC Motor
- Separately Excited DC Motor
- Self Excited DC Motor
- Shunt Wound DC Motor
- Series Wound DC Motor
- Compound Wound DC Motor



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- Cumulative compound DC motor
- Short shunt DC Motor
- Long shunt DC Motor



CIRCUIT DIAGRAM

ARDUINO IDE SOFTWARE

The software that is used to program the microcontroller is open-source software and can be downloaded for free on www.arduino.cc. With this “Arduino software” you can write little programs with the microcontroller should



perform. These programs are called “Sketch”.

In the end the sketches are transferred to the microcontroller by USB cable. More on that later on the subject “programming”.

PHP – INTRODUCTION

PHP started out as a small open source project that evolved as more and more people found out how useful it was. Rasmus Lerdorf unleashed the first version of PHP way back in 1994.

- PHP is a recursive acronym for "PHP: Hypertext Preprocessor".
- PHP is a server side scripting language that is embedded in HTML. It is used to manage dynamic content, databases, session tracking, even build entire ecommerce sites.
- It is integrated with a number of popular databases, including MySQL, PostgreSQL, Oracle, Sybase, Informix, and Microsoft SQL Server.
- PHP is pleasingly zippy in its execution, especially when compiled as an Apache module on the Unix side. The MySQL server, once started, executes even very complex queries with huge result sets in record-setting time.
- PHP supports a large number of major protocols such as POP3, IMAP, and LDAP. PHP4 added support for Java and distributed object architectures (COM and CORBA), making n-tier development a possibility for the first time.
- PHP is forgiving: PHP language tries to be as forgiving as possible.
- PHP Syntax is C-Like.

How to View HTML Source

A good way to learn HTML is to look at how other people have coded their html pages. To find out, simply click on the View option in your browsers toolbar and select Source or Page Source. This will open a window that shows you the actual HTML of the page. Go ahead and view the source html for this page.

MYSQL

MySQL is an open-source relational database management system. Its name is a combination of "My", the name of co-founder Michael Widenius's daughter, and "SQL", the abbreviation for Structured Query Language.

MySQL is free and open-source software under the terms of the GNU General Public License, and is also available under a variety of proprietary licenses. MySQL was owned and sponsored by the Swedish company MySQL AB, which was bought by Sun Microsystems (now Oracle Corporation). In 2010, when Oracle acquired Sun, Widenius forked the open-source MySQL project to create MariaDB.

Linking Tags

`text link` places a hyperlink in your webpage.

III. CONCLUSION

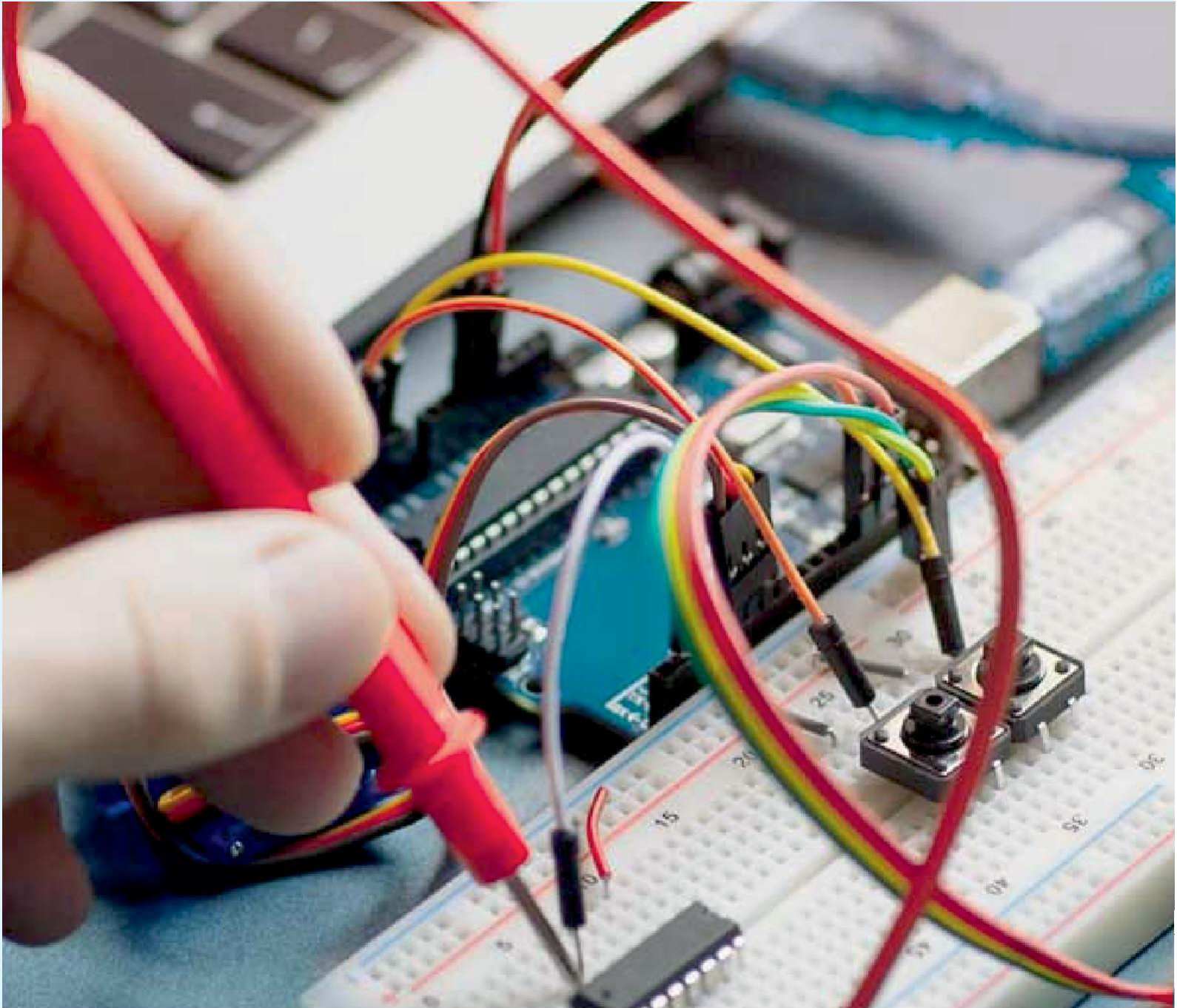
The project contains some gaps; First, The DS does not have sensors to detect if the SMB is in the right position or not. In addition to that, SMB consumes battery in short time that affects the performance of SMB. Moreover, voice recognition requires loud and clear voice; otherwise, the user should repeat some instructions. As this project is a prototype and due to the limited time, the packaging and the size of the device are not efficient enough and it needs to be improved and modified. This project can be improved to add more features such as adding buttons as a way of interaction and a screen for visible people. Voice interaction could be with different languages especially Arabic languages as it could be preferred locally. Equally important that DS should be redesigned to be able to handle different pills sizes and shapes and support liquid medicines. VI. FUTURE WORK Though the proposed method is cheap, portable and automated; there is some functionality that can be improved. The size of SMB can be reduced even more to be practical. Addition of screens and voice interactions in Arabic can be done. Also a provision to switch off the voice interactions can be made. Additional care can be taken to design DS to load different shapes and sizes of the pills. Addition of scanner that can scan medicine prescription and add medicine information directly.



Finally, a new feature that allows the doctors or caregiver to access and update the medicines' information through Wi-Fi can be added.

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