Retraction

Retraction: Medicine Lending Machine for Elderly Patients
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This article (and all articles in the proceedings volume relating to the same conference) has been retracted by IOP Publishing following an extensive investigation in line with the COPE guidelines. This investigation has uncovered evidence of systematic manipulation of the publication process and considerable citation manipulation.

IOP Publishing respectfully requests that readers consider all work within this volume potentially unreliable, as the volume has not been through a credible peer review process.

IOP Publishing regrets that our usual quality checks did not identify these issues before publication, and have since put additional measures in place to try to prevent these issues from reoccurring. IOP Publishing wishes to credit anonymous whistleblowers and the Problematic Paper Screener [1] for bringing some of the above issues to our attention, prompting us to investigate further.

[1] Cabanac G, Labbé C and Magazinov A 2021 arXiv:2107.06751v1

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Medicine Lending Machine for Elderly Patients

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Abstract. In this fast moving life style almost everything around us are getting automated. This in turn greatly reduces the time taken for a work and also increases efficiency. An automatic medicine lending machine is one that helps the patients and uneducated people to keep track on their medical pills in a timely manner. This machine contains containers that contain loaded pills that can be dispensed in timely manner. Major components in this machine are stepper motor, large storage space and inventory monitoring system. All these are monitored by a program fed microcontroller. This machine also contains the alarm system which reminds the patient to take pills at correct time. This machine also has a data storage system which stores the exact date and time that the patient took the medicine from the medical box. From the above concept we can conclude that, this medicine lending machine is feasible for elderly patients to take the medicines by alerting them at the right time.

1. Introduction

In our daily life the usage of medicine is increased due to the fact that humans are affected to various diseases easily and in this busy world everybody is running behind job and money and nobody spends time to look after the elders in their house whether they took medicine correctly or not and sometimes they themselves forgot to take medicine in a correct time which affects their health conditions. The elders in every family are mainly affected by various diseases like Blood Pressure, Sugar, Thyroid, Joint Pains etc. They need a special care from their family because when they took the wrong medicine it affects their health very badly. On the other hand there is a solution for every problem because of the evolution of new technologies and it is very easy to monitor anybody by using those technologies. The technology we adapt here help the younger generations to monitor their parents and elders anytime and anywhere. This also helps the doctors to keep track on their patients and helps them to find at what time the medicines are taken by their patients. There are already many projects available but our project have some other extra features like cloud data storage system, remaining pills count etc.

2. Existing Method

In the paper [1] an automatic machine for medicine lending is built using PIC microcontroller connected to GSM, LCD and a keypad. This machine is designed to provide medicines at any time when placed in a hospital or private place. So it is clearly seen that the machine provides only the common medicines that are taken for fever and cough. This serves as the main disadvantage of this system. This system is incapable of providing prescribed medicine for dedicated person. In the paper [2] the medicine vending machine is equipped with Raspberry Pi. This machine collects coins after
providing the required medicine. This system ensures availability of pills 24/7, but the main drawback is that as they are places in the public places and the machine does not have any user authentication or verification method to ensure security for the medicines loaded in the machine. In the paper [3] the lending machine controlled using PIC microcontroller provides medicine to a dedicated patient when he/she comes and type the medicine they want. The main disadvantage of this system is that it does not have any alerting system if the patients do not take their medications on time. In the paper [4] the medicine lending machine is designed using Arduino WeMos and RTC. This system is designed for dedicated patients. The main disadvantage from all the above machines is that they do not store any database of patients pills taking time and also those machines do not notify the care takers about the remaining pills in the machine. Figure 1 shows Block diagram of existing method.

3. Proposed Method

The mechanical structure of the machine contains boxes with number of slots, Arduino UNO, Buzzer, LCD display, Real Time Clock module, Wi-Fi module, Push buttons and LED lights. The connections are made with these components and the program is dumped into the Arduino UNO. The number of slots available in the machine can be assigned to different time periods like Morning, Afternoon Evening and Night with the help of LCD Display and Push button [5]. For Example: If the machine has 8 slots/chambers, the first slot can be assigned for morning before food, second slot for morning after food, third slot for noon before food and so on. This can be assigned by the user and after assigning the slots for different time periods, the tablets are filled in the respected slots. This system also has the advantage that the user can set the time so that the alarm rings in the specific time. RTC DS3231 is used to get the real time and whenever the alarm rings and the button is pressed the specific box is opened and it is also indicated using LED lights. With the help of Wi-Fi module the tablet taken time is stored in the cloud and the access is given to the family members and doctor so that whenever they can check whether the specific person took tablet in correct time or not. In addition to this the pills count is regularly updated and the person with access to cloud can check the remaining number of pill and can buy the pills in advance. This machine mainly helps the elderly patients because due to ageing they forgot to take tablets in correct time and in some houses they always depend on someone to give tablets in time. To overcome the problem this machine is designed so that they need the help once in a month for filling tablets in specified box [6-9].
4. Hardware Description

A. ARDUINO UNO

➢ The Arduino Uno of model AT Mega328 is used here.
➢ This board contains 14 digit I/O pins.
➢ The operating voltage is around 5V and the recommended Input Voltage is from 7-12V.
➢ The flash memory ranges from 32kB. SRAM with 2kB and EEPROM with 1kB. It contains a frequency of 16 MHz as shown in Figure 3.

B. LCD DISPLAY

➢ LCD is a modulated optical device that uses light-modulating properties of liquid crystals combines with polarizer.
➢ They do not emit light directly but they use backlight or reflector to produce images in monochrome. In this project 16x12 LCD display is used.
➢ The 16x12 display which is the basic one among the LCD display as shown in Figure 4.
➢ It could display a custom generated character
C. BUZZER

➢ Buzzer also known as beeper and it is a audio signaling device
➢ They are usually used alarm devices, timers and confirmation of inputs from the user.
➢ Basically, the buzzer contains two pins namely power and ground.
➢ Whenever the current is being applied to the buzzer pins it causes either contraction or expansion of the ceramic disk as shown in Figure 5.
➢ This in turn causes sound due to vibration of disc.

D. PUSH BUTTON

➢ A push button is a simple switch mechanism to control some aspects of a machine
➢ Particular connections only when we press the button as shown in Figure 6.
➢ It makes the circuit connected when pressed and breaks when released.
➢ A push button is also used for trigger of SCR by gate terminal
E. STEPPER MOTOR

- Step angle: 1.8 ° per step, Holding torque: 46Kg/Cm, (4.6Nm)
- Motor Shaft Length: 31mm, Shaft Diameter: 12mm
- Rated Current: 4Amp, Rated Voltage: 4.16V
- 4 wire, Stepper motor is compatible with all 2-phase drivers
- Motor mounting frame Size: 86mm x 86mm
- Mounting direction: both horizontal & vertical
- Use in positioning and torque for 3D printers
- DIY CNC, XY plotters, Industrial automation, robotics, Solar platform position, robotics automation, laboratory equipment, Packaging Machinery as shown in Figure 7.

![Figure 7. Stepper Motor](image)

F. LED LIGHTS

- LED is a light emitting diode that is made of semiconductor materials as shown in Figure 8.
- The electrons present in the semiconductor combines with holes resulting in formation of photons.
- They also have wide variety of color range which can be employed in different aspects of the project.

![Figure 8. LED Lights](image)

G. WIFI MODULE

- The Wi-Fi that allows to connect us to the network and transfer data
- They use certain protocols like TCP/IP to communicate as shown in Figure 9.
- Through Wi-Fi module we can save the Medical reports of the patients in a dedicated cloud storage.
- They are considerably affordable in cost.
- The I/O source current is 12mA maximum. It also contains a built with the low power of 32-bit MCU with a frequency of 80MH
H. RTC DS3231

➢ The RTC DS3231-Real Time Clock is a chip that automatically switches between main and backup power sources when necessary.
➢ The RTC keeps track on seconds, minutes, hours, day, date and years data.
➢ It also automatically adjusts for months with less than 31 days and also for leap years. The clock can operate in either 24H or 12H(with AM/PM) formats as shown in Figure 10.
➢ The digital temperature sensor with plus or minus 3 degree Celsius.
➢ The output is in form of programmable square wave output.
➢ It consumes very low power and the battery has two to three year life this is the main reason for using this in the project.

5. Flow Diagram

Flow Diagram Explanation:

➢ The time buzzer should alarm is set by the user during the time of filling tablets into the machine.
➢ The RTC feeds the real time to the Arduino.
➢ Whenever the real time equals to the assigned time the alarms starts to ring.
➢ The alarm rings till the button is pressed by the patient.
➢ If the button is pressed by the patient the alarm stops as shown in Figure 11.
➢ After that desired box is opened with the help of stepper motor
➢ The specific box from which the tablets are to be taken is indicated using LED lights.
➢ The data such as time and date is sent to the cloud using the Wi-Fi module.
➢ The pills count is updated in the cloud automatically.
6. Conclusion
This machine is not only useful for the elderly patients but also to the persons who took medicine on regular basis. This machine helps the doctor very much because many of us cheat them by saying that the tablet is taken regularly at correct time and complaint them when the disease gets severe or not get cured. The machine has the capability of storing months of data so whenever we visit the doctor the doctor can confirm by the data whether the person took tablet in correct time or not. It has lot more advantages that it is portable and user friendly so anyone can use easily. Arduino is used as a controller which is available at cheap rate so that overall cost of machine is also reduced. If needed this machine can be made in such a way that it is operated in both battery power and normal AC line.

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