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Automatic Medical Drawer System Using Face Authentication

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ABSTRACT:

Today, manual systems of care are employed in the medical field. In which drawer, it is impossible to find out what kind of medicine is available. The main problem with the normal system is this. As the customer base increases, regular systems become more complex and take longer to operate. They need to know what the store is all about. Our system's going to find out where the medicine is. Our system synchronizes with the devices and software that are working quickly, so it saves a lot of time.

The project proposes to use ATmega328P microcontrollers for the design and implementation of a digital medicine drawer. There is a GSM module installed in the drawer, as well as an air conditioning and face detection system. If the medicine is about to run out, the GSM module will send an SMS message to the user. To keep the medicinal product at a constant temperature, the cooling system shall be used. In order to prevent unauthorised access to the drawer, a facial detection system shall be used.

The Resources which we have used during this project building are ATmega328P microcontroller, GSM module, Cooling system, Python, OpenCV, Embedded Systems.

INTRODUCTION:

For better reliability and faster functioning, a complete automated system for the medical drawer shall be implemented. The drawer systems nowadays are manual or automatic on some instinct, but we have made a system that is truly automated. The main issue now is the automation of all sectors. However, some problems such as automated opening and closing of drawer, invoicing, quantity remainders, expiry dates restand Automatic cooling system for the requested separate storage compartment have been encountered in certain areas like medicine.We have come up with an idea for these all problems in one model.

It's the combination of hardware and software that is our model. Hardware based on a microcontroller ATmega328P and motors is built up in the first stage through Bluetooth connections with motor drivers. In the area of software, we use Python for Machine Learning Platform that's how our software is developed. Software get the information about medicine and which compares with saved medicine data. Depending on the owner's convenience, that data can be saved in software.This information is sent to the Microcontroller for additional processing. The microcontroller will process the data, detecting and opening the drawer we require using its I. O.S. ports to indicate what it's looking for. The next generation of the current system is systems such as ours. It takes less time for our system.

LITERATURE SURVEY:

1.Auto-Open Drawer

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It may be a difficult task to gain access to the full, weighty drawer. This will also apply to people who can't move for long periods of time, and they may have trouble opening the drawer using their strength or range of motion. We want to enhance the drawer opening and closing mechanisms in order to give people with restricted mobility more autonomy. We will create a system that can extend and retract drawers in a dresser without input from the user beyond a command signal. In view of the fact that people with limited mobility already invest in various aid services, our drawer system needs to be as affordable as possible. The price of the automated dresser needs to be at least twice as much as that of an equivalent technologyless dresser. IKEA's got three main drawer dressers, ranging in price from $40 to $180. It's because of this that our design can be very flexible in cost, and the final price for these additions will remain under $180.

2. Development of Electrical Push Open for Drawers

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The objective of making life easier for the user of the product is one of the main objectives of today's furniture design, which is why an open electrical outlet has been developed. It is mainly used in the kitchen environment today, both in the drawer and in the door. When a user gives the drawer or door a little push, the function of an electronic opening is that it opens with automatic operation. The objective of the project was to develop concepts for electrical opens, build simple prototypes, perform cost analyses and describe their functions in a function description. Delimitations of the project were to focus on a TV-bench and not focus on developing the software for the push open. The concept work was designed as intended, but it would need further development before its production could take place.

METHODOLOGY :

Finding problem statement :

We visited a medical store to find out what's going on in the neighbourhood, and we discussed the issue of the job. We had planned to make a drawer system that would be automated once we found out about the Manual System of Drawers at the shop.

Planning :

Trying to solve the problem, and coming up with a solution. This step includes goals, scope and working to be carried out. A detailed project plan is envisaged, with the responsibility of each group member being laid down in order to organise work processes.

To find the required hardware and software resources :

According to the work plan of project, this includes identifying the correct hardware and software resources and to know about their functionalities.

Hardware design :

This shall also cover the design of hardware which was obtained by means of these resources. The hardware is built on a microcontroller, motors and drivers, GSM module 900A, cooling system and all the components needed to build it.

Software design and Implementation of hardware :

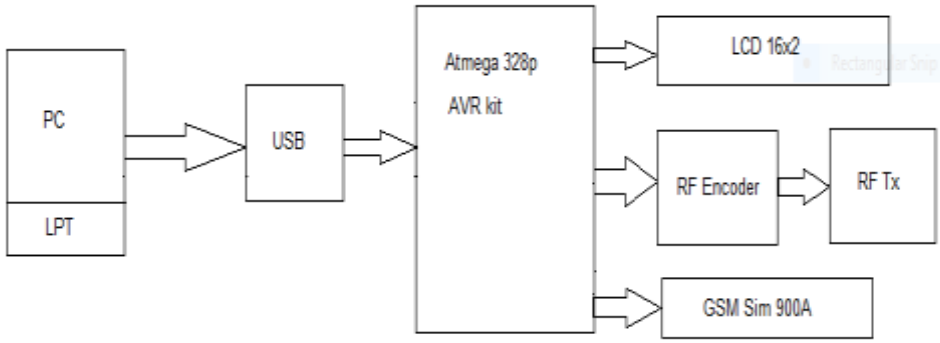
This step includes the software design according to our hardware and implement the connection of system. The software is made using Python language, machine learning algorithms and different python libraries such as OpenCV, Matplotlib, Firebase etc.

Testing :

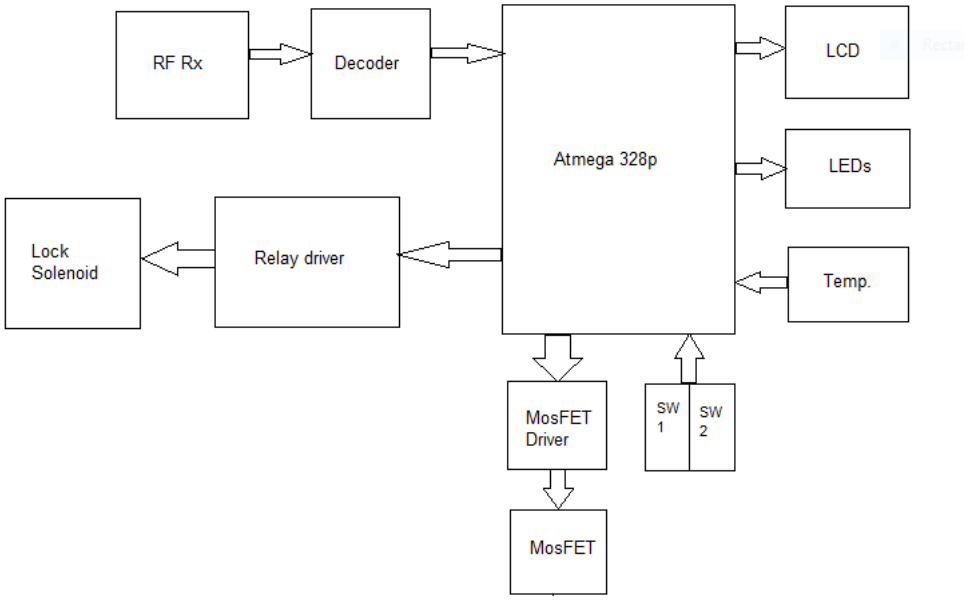
To evaluate the entire system with real world resources and to check that it is functioning in accordance with the requirements laid down at this stage. The safety, reliability and functioning of this equipment must be taken into account.

SYSTEM IMPLEMENTATION AND BLOCK DIAGRAM :

Transmitter :



Receiver :



Block diagram of proposed system :

The block diagram for the proposal system is given in the figures above. For software interaction with the system by means of a USB cable, this transmitter includes laptop or personal computer. Data to be entered for model mechanism are shown in the software interface. Microcontrollers, which obtain the software data and use it to perform further action, are a major component of this model. Displays on the LCD screen show information such as temperature. The RF encoder encodes the data from controller and transmit the data for further process via RF transmitter.

There is a RF receiver receiving information from the transmitter, and an RF decoder decoding it into data for drawer opening and closing. The controller shall process the received data, and the relay driver shall convert that data to a change in the relay. The motor is driven by the driver and signals an electric solenoid lock attached to each drawer, which should be opened for a specified time. To send an SMS to a contact number that is the remainder of the stock and the expiry date of the medicine in the drawer, the GSM module Sim900A receives the data and compares it to the stored data. Temperature sensor DHT11 senses the temperature at all times, turns on the cooling system that is needed for cold storage if it exceeds the required temperature.

CONCLUSION:

Finally, significant progress has been achieved with regard to the development and introduction of automated medical cabinets that use face recognition technology. The need to deliver medical supplies effectively and safely is addressed in this novel approach, which ensures that authorized staff are able to carry out the collection of essential items. In addition to boosting security measures, integrating face recognition will facilitate the process of medical supply management by making it easier for a more structured and effective time allocation. Our system has proven to be reliable in accurately identifying and verifying individuals through rigorous testing and validation, contributing to its overall effectiveness and efficiency.

The potential impact of this technology on healthcare settings, promising improved patient care and operational efficiency, is underlined by the positive results observed in real world scenarios. Future work may also look at other features and improvements, e.g. real time inventory tracking, integration with EMRs or scaling up to meet the needs of a wide range of healthcare settings .Furthermore, addressing potential challenges and ethical considerations will be crucial to ensuring the responsible and widespread adoption of this technology.

In summary, this research has shown how the automated medical drawer system in question cannot just solve a problem of healthcare supply management but also lead to future development of smart healthcare systems. This activity aims at creating safer, more effective and patient focused environments by contributing to the continuous evolution of healthcare technology.

REFRENCES:

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2. Master of Science Thesis MMK 2013:38 MKN 086 KTH Industrial Engineering and Management Machine Design SE-100 44 STOCKHOLM