

SALINE LEVEL MONITORING SYSTEM

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Abstract

During recent years, due to technological advancements any sophisticated techniques have been evolved for assuring fast recovery of patients in hospitals. Need for good patient care in hospitals, assessment and management of fluid and the saline supply is the most fundamental thing required. All most in all hospital's nurse is responsible for monitoring the saline bottle level. But unfortunately most of the time, the observer may forget to change /remove the bottle at correct time due to their busy schedule. To overcome this critical situation an IOT based automatic altering and automatically off's the saline supply system is proposed where a weight sensor is used for measuring the weight then the input weight is converted into respective voltages. When the saline reaches the threshold limit the buzzer will produce an alarm sound and the servo motor which is connected to the infusion set will off's the saline supply. In hospital ICU, CCU, NICU most of all department of hospital required such kind of automatic monitoring system. Also health care industries will one of the users. Such monitoring system can be useful in small, medium and large size hospitals. Such a system will give assurity of non-harm conditions to patients.

1. INTRODUCTION

Saline solution is used in the hospital whenever some energy needs to be supplied to the patient in form of liquid. But there are some issues with this saline injection process. As there is more quantity to be injected it takes time to complete this process. In this injection process, continuous monitoring is required, where it is difficult in many hospitals. The monitoring staff may forget about the patient. This forgetting may

result in serious danger to the patient. when the saline bottle is about to empty the blood from the body of the patient flows back into the bottle. This flowing back of blood causes serious damage to the patient. The patient might be in a situation of unable to check his own saline bottle level.

2. RELATED WORK

The Literature studies the various technologies that are used worldwide in the automatic saline bottle level

detector. The load sensor is fixed on saline hanger and bottle is hung on it. This sensor converts the varying weight of the bottle into different voltages. So, each level of saline weight corresponds to some specific voltage. The output voltage from the load sensor is fed in the ESP32 WiFi chip. Out of the continuous input voltage received, when the specific voltage of interest is obtained, ESP32 will produce the suitable output. message such as FULL, ALERT and CRITICAL. The messages are generated under the following conditions.

1. FULL, when the saline bottle is full.
2. ALERT, when the liquid level is reduced to 50%.
3. CRITICAL, when only 10% of the liquid level is left in the bottle.

The generated output message is then published through WiFi network.

The drawbacks of the system is if there is no WiFi available the ESP32 WiFi chip will not send the SMS to the nurse. So, the saline level would not be detected. If it detects it will not off the saline supply automatically.

3. IMPLEMENTATION

Design a small machine which detects the saline bottle level and off the saline supply automatically before saline bottle becomes empty.

Objective

There is a back flow of blood when the saline bottle suddenly becomes empty. So the nurse's need an automatic system which detects the saline bottle level. We connect the load cell, Servo Motor and Buzzer to the Arduino. The power supply is given to all these by Regulated Power Supply. The saline bottle is placed on the loadcell. Loadcell detects the weight of the Saline bottle and displays it on the LCD. We initially set some particular threshold in the code written. If the weight of the Saline bottle reaches the threshold, with the help of Servo motor saline flow will be stop and a alarm sound is produced by the Buzzer so that near by available nurse's will hear and remove the saline bottle.

4. EXPERIMENTAL RESULTS

The aim of the project to stop the saline bottle flow before the saline bottle becomes empty. So that there will not be any backflow of blood. So we use the load cell which continuously calculate the weight. If the weight match with the threshold which is present in the code. The servo motor Off the saline flow and alarm sound is produced by Buzzer so that if there are near by nurse's they can hear and remove the saline supply. In this project we connect the load cell, Servo Motor and Buzzer to the Arduino. The power supply is given to all these by Regulated Power Supply. The saline bottle

is placed on the loadcell. Loadcell detects the weight of the Saline bottle and displays it on the LCD. We initially set some particular threshold in the code written. If the weight of the Saline bottle reaches the threshold, with the help of Servo motor saline flow will be stop and a alarm sound is produced by the Buzzer so that near by available nurse's will hear and remove the saline bottle.



Business Model

5. CONCLUSION

1. We have proposed a cost-effective smart saline level surveillance system by which the level of the saline feeding to the patient can be monitored by the nurse, care taker, hospital staff, doctor etc.
2. We have adopted A protocol as it is efficient for low cost and low power devices.
3. If the Saline level reaches threshold the system automatically off the saline supply and buzzer produces an alarm sound.

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