

INTERNET OF THINGS USING IOT

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Literature about IoT

The Internet of Things (IoT) is the devices or things that have sensors installed in them so they can connect and exchange data with other IoT devices and upload to the cloud through a network. A broad range of industries around the world are widely utilised IoT technology for the purpose of boosting productivity, ameliorating customer service, making better decisions, and enhancing the value of their business. IoT allows data to be transferred across a network without requiring communication between people or between people and computers. An Internet of Things ecosystem is made up of web-enabled smart devices to gather, transfer, and act upon data they gain from their surroundings using embedded systems, which include Central Processing Units (CPUs), sensors and communication hardware. (S.Gillis, n.d.)

People can live and work smarter thanks to Internet of Things. IoT makes it possible for machines to accomplish monotonous and repeated tasks without assistance from humans. Companies may apply IoT technology to automate procedures, lessen cost of labours, reduce wastage, and upgrade the service of delivery. In addition, IoT technology is not only beneficial to business, but also essential to home used. Users' lifestyle will be improved via making use of IoT-embedded devices like cars. For instance, an individual's car may communicate with the garage to open the door when they get home. It creates convenience for the owners as they are not required to get out of the car to open the door, especially during the day of downpour. (S.Gillis, n.d.)

Due to the benefit of using IoT at home, we plan to adopt a system of IoT based water level indicator on bathtub at home so that the data can be monitored via cloud over a stable network. Ultrasonic sensor is known as an electronic device that utilises ultrasonic sound waves to measure an object's distance and then transforms the sound into an electronic signal when it is reflected. The speed of ultrasonic waves exceeds the rate of audible sound. Two primary

parts of ultrasonic sensors are the transmitter and the receiver. By using an ultrasonic distance measurement sensor, the water level of the bathtub will be detected. (IoT Based Water Level Indicator Using Ultrasonic Sensor, 2020) Sensor will record the water level in bathtub and send to the cloud. User can check the record of water level remotely via mobile phone. User will be informed that the condition of the water level through mobile phone over the network and promptly go to bathroom to switch off the water when the water level reaches the high level. It helps user to prevent water waste and save the cost of water bill. While waiting for the water filled in the bathtub, user can execute other daily chores including do dishes, do laundry, and sweep the kitchen.

Problem Statement

Our project addresses the common challenge of monitoring bathtub water levels, aiming to tackle issues related to forgetfulness and the inconvenience of constant monitoring. Traditional solutions often lack precision, relying on manual checks and standard overflow drains, leading to water inefficiencies. We employ IoT technology, using the NodeMCU ESP8266 microcontroller and an ultrasonic sensor for precise water level detection. (Long Tail Risk, 2019)

Informed by sustainability goals and research by (Long Tail Risk, 2019) our solution not only mitigates forgetfulness risks but actively contributes to broader water conservation efforts. The system, beyond functionality, includes LED indicators for real-time information on water levels and system status. Designed for energy efficiency, our system targets a significant reduction in manual intervention to prevent unintended bathtub overflows.

Tailored for homeowners, especially those who regularly use bathtubs, our automated approach offers a simplified method for managing water levels, directly addressing challenges posed by forgetfulness. Throughout the development process, we remain mindful of constraints such as budget limitations, time constraints, and compatibility with various bathtub designs. (Long Tail Risk, 2019)

The success of our project will be measured by tangible outcomes, including a noticeable decrease in unintended overflows and evident improvements in energy efficiency. Going beyond a quick fix, our IoT system represents a shift in home water management, aligning with broader environmental sustainability objectives through LED indicators. Customized for homeowners, our design prioritizes the user experience, exemplified by simplified interaction. In essence, this project represents a conscious step toward a more sustainable and user-friendly future in managing water levels at home. (Long Tail Risk, 2019)

The model

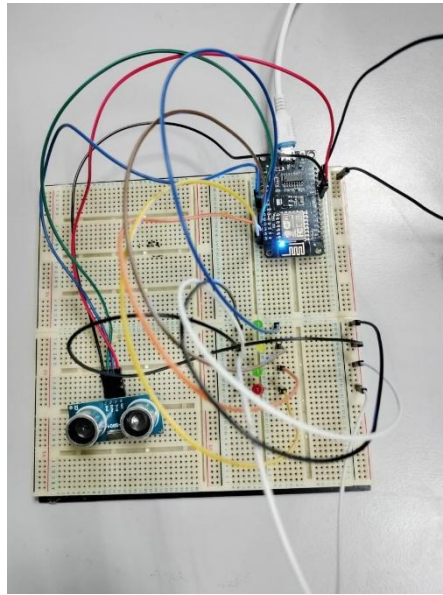


Figure 1: The model of the water level monitor project

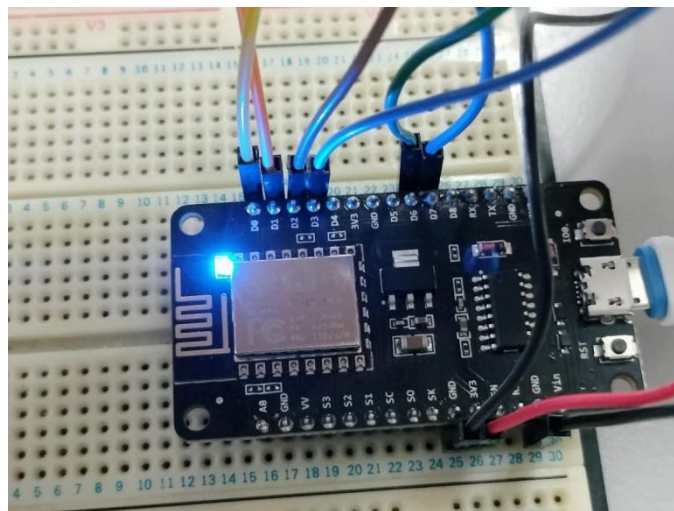


Figure 2: NodeMCU ESP 8266

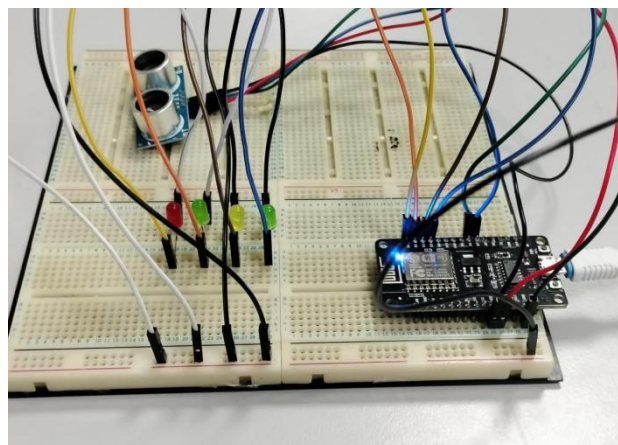
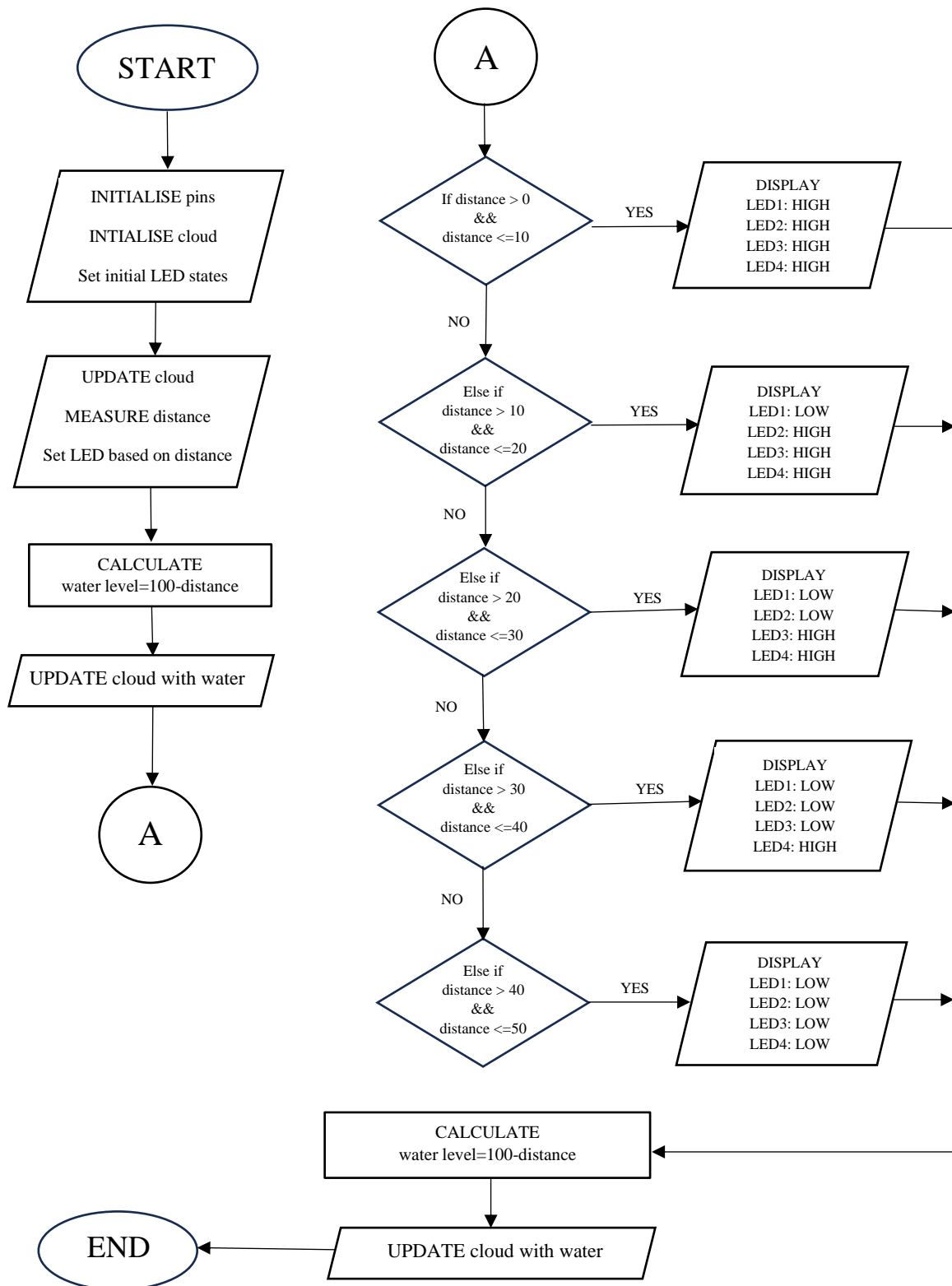


Figure3: Side view of the model

Flowchart



Conclusion

This project provides a solution for remote water level monitoring, preventing overflow, and minimising water waste. By allowing users to track and protect against excess water use, it addresses a crucial concern in residential areas. The proposed system plays a pivotal role in significantly reducing water loss. With real time-data, users will have the ability to manage the water level by maintaining it between 30% to 70% of the bathtub capacity. This ensures the prevention of overflow and promotes mindful water management practices. (Gourav Jaiswal, Luv Agarwal, Subhadip Roy, Rajreeta Maiti, 2019)

References

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