

Smart Water Fountains Project Documentation

Introduction

The Smart Water Fountains project aims to enhance public water fountains by implementing IoT sensors, a mobile app, and Raspberry Pi integration. This project addresses the objectives of real-time water fountain monitoring, efficient water usage, early malfunction detection, and raising resident awareness about the status of public water fountains. The following documentation provides an overview of the project's key components and their implementation.

Objectives

The project has the following objectives:

1. Real-time Water Fountain Monitoring: Implement IoT sensors to provide real-time data on the operational status and water flow rates of public water fountains.
2. Efficient Water Usage: Enable better water resource management by monitoring water flow and promoting responsible usage.
3. Early Detection of Malfunctions: Detect and report malfunctions in real-time to ensure timely maintenance and minimize downtime.
4. Raising Resident Awareness: Develop a mobile app to provide residents with real-time information about water fountains, fostering community awareness and engagement.

IoT Sensor Setup

Sensor Types

The project employs the following IoT sensors:

- Flow Rate Sensors: These sensors measure the flow of water from the fountains.
- Pressure Sensors: Monitoring water pressure helps detect anomalies and malfunctions.
- Temperature Sensors: These sensors monitor the environmental conditions around the water fountains.

Sensor Deployment

Sensors are strategically deployed in public water fountains across the target area, calibrated for accurate measurements. Data from these sensors is transmitted to a central server for analysis.

Mobile App Development

A user-friendly mobile app has been developed to display real-time water fountain data to residents. Key features include:

- Operational Status: The app indicates whether a nearby water fountain is operational.
- Flow Rates: Real-time flow rate information helps residents estimate water availability.
- Malfunction Alerts: The app provides alerts when malfunctions are detected, allowing for timely repairs.

Firestore IOT Based Temperature & Humidity Monitor



Temperature : 0 °C



Humidity 0 %



Motor OFF

ON

OFF



Raspberry Pi Integration

Raspberry Pi devices act as a bridge between the IoT sensors and the central server. They collect data from the sensors and ensure secure transmission to the server. The data is then made accessible through the mobile app.

Code Implementation

The project's code is developed using web development technologies, including HTML, CSS, JavaScript for the mobile app, and Python for the server-side data processing. The code implements real-time data retrieval, processing, and presentation for users.

Promoting Water Efficiency and Public Awareness

The real-time water fountain status system promotes water efficiency and public awareness in several ways:

1. **Efficient Water Usage:** By providing real-time information on water flow rates, residents can make informed decisions about water usage, promoting responsible and efficient resource utilization.
2. **Early Malfunction Detection:** The system's ability to detect malfunctions in real-time enables prompt maintenance, reducing water wastage due to malfunctioning fountains.
3. **Public Awareness:** Residents gain access to information about the status of public water fountains, fostering community awareness about the importance of water conservation and public service maintenance.

Conclusion

The Smart Water Fountains project successfully enhances public water fountains by implementing IoT sensors, a mobile app, and Raspberry Pi integration. By achieving its objectives and promoting water efficiency and public awareness, this project contributes positively to the community and the environment. Screenshots, diagrams, and schematics of the IoT sensors and mobile app are available for reference in the project documentation.