

IoT-Based Water Leak Detection for Residential Buildings

Visit and Problem Identification

Conduct a Group Visit

In order to find and analyze the problems related to the water leakage, our group went to several low-rise buildings, markets and hotels dusty.

Document the Problems

Noticed Problems:

- Water Leakage: A number of buildings suffer from unnoticed and damaging water leakage as seen in the massive billed water expenses.
- Limitations of Detection: The merit about some of the detection devices is that they are not continuous and thus any leak that occurs while the monitoring is suspended might go unnoticed for quite some time.
- Cost: Normal leak detection methods and devices are out of reach for most residents as they are costly.
- Discomfort: Physical checks of the sites for any leaks were slow and due to the nature of the work, were prone to delays.

Analysis and Selection

Analyze the Identified Problems

After Analysis, we found that:

- Frequency: It is not new to many buildings that water leakages are frequently noticed.
- Severity: Water infiltrated leakage can lead to a lot of damage costs on the property together with high water bills as well.
- Impact: Impacts families' households and the ecological nature because of water wastage.

Problem Selection

Selected Problems

- Efficient Water solder Leak Prevention: In order to avoid water misuse and destruction of assets.
- Accessible Solutions: Reasonable pricing so that many people will be able to afford them.

Rationale

These particular problems are worth tackling because they provide people with immediate relief by forestalling wastage and destruction of water and such a cost-effective approach is realistic.

Solution Design

Detailed Design

System Overview

An IoT based Real-Time Application of Water Leak Detection and Warning System.

Technical Specifications

- Sensors: Water flow and leak sensors will be fixed at the desired positions.
- Microcontroller: Processing Unit which may be Arduino or other suitable ones.
- Connectivity: Wi-Fi, Bluetooth linkage for data transmission.

- Notification System: Use of mobile apps or SMS to send out alerts to unnecessary alarms.
- Power Supply: Battery powered with very low energy consumption or wired.

Features

- Leak detection capability in real time
- Push Notifications through Mobile App
- Simple installation
- Routine Health Evaluation of the Loop

Potential Impact

Detection of the leaks at the early stage to prevent damage, save on the water bills and use water effectively.

Concept Sketch

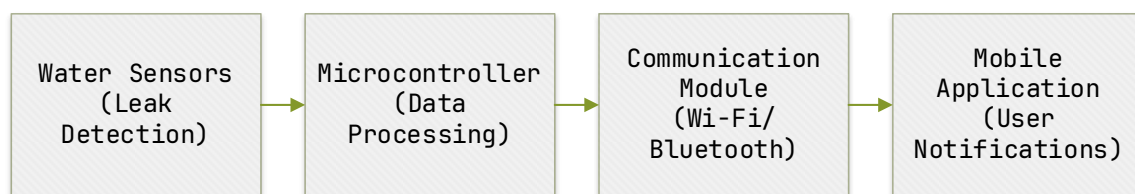
Description

Describe a concept sketch that includes:

- Sensor Placement: On pipes and leak prone surfaces.
- Microcontroller Unit: Yardstick for data computation.
- Communication Module: Wi-Fi/Bluetooth transmission of data.
- Mobile App Interface: Alerts for users and notifications.

Concept Flowchart

Report Presentation



Overall Report Presentation

Structure:

- Introduction: Explain the water leakage as a problem and a way of resolving it.
- Methodology: Touch upon garment and its stages and the problems encountered including analysis.

- Findings: Identify the main issues and justify the areas of focus selected.
- Conclusion: State the solution suggested, its gains and the drawbacks if any.

Writing Quality

Checklist:

- Clarity: Use simple and plain language.
- Coherence: Be particular about the interconnection of paragraphs in the report.
- Grammar: Recheck the report for any grammatical errors.
- Citation: Add a bibliography of any other sources that were used.