AQUASENTINEL

SMART ROVER FOR WATER LEAKAGE DETECTION

Origin of the Idea

Water is often wasted silently through undetected leaks in residential buildings. Inspired by the urgent need for sustainable urban living, we envisioned a compact, sensor-powered rover that could travel inside pipelines and detect leakages early. This concept bridges IoT, robotics, and sustainability — helping cities save water and protect infrastructure.

Vision and Mission

Vision: To develop intelligent tech solutions that help buildings conserve water and prevent infrastructure damage.

Mission:

- **Create a compact, pipe-navigating rover using IoT sensors**
- **Detect hidden leakages before they cause serious harm**
- **Provide real-time data for preventive action**
- **Promote water sustainability in smart buildings**

Our Sensor Stack & Capabilities

Leakage Sensors

4+ advanced sensors including:

- Moisture Sensor (YL-69)
- Flow Sensor (YF-S201)
- Ultrasonic Sensor (HC-SR04)
- Optional ESP32-CAM

Target Coverage

1000+ Apartments and buildings

- Ideal for residential pipelines
- Scalable to urban smart water systems

IoT Connectivity

Real-Time Alerts via ESP8266

- Wi-Fi enabled data transmission
- Compatible with Arduino Cloud

How It Works

- Rover is inserted into residential building pipelines
- Sensors detect moisture, flow drop, and nearby obstructions
- Data is sent to a dashboard or app via Wi-Fi (ESP8266)
- Leakage alerts are generated for early maintenance

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Strengths

- Compact and innovative design
- Real-time IoT alerts
- Green tech for sustainable cities

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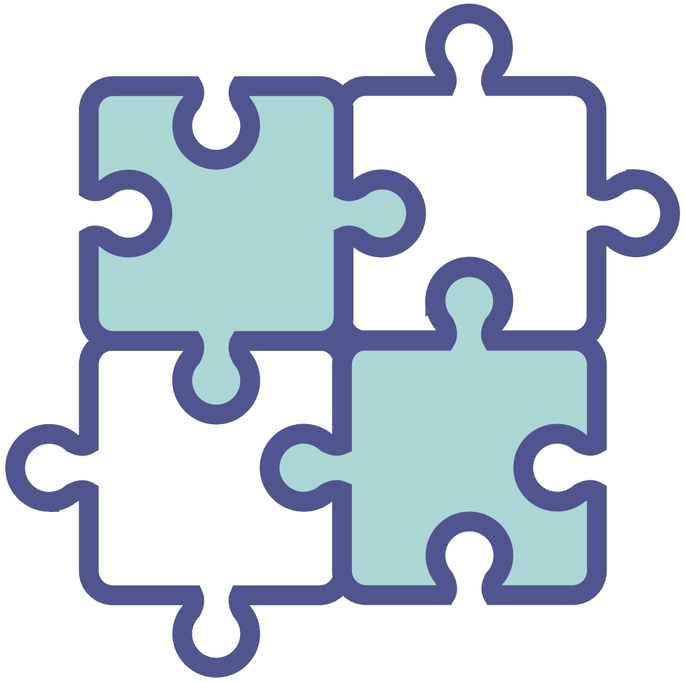
Weaknesses

- Limited in very narrow or curvy pipes
- Battery-dependent



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Threats

- Competing systems with thermal imaging
- Difficulty in reaching deeply buried pipelines

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Opportunities

- Integration in smart buildings
- Government support for water conservation

Thank you very much!

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