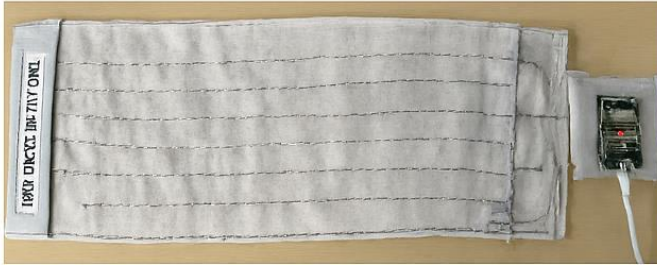


Reusable Wetness Detection Sensor

Smart, washable, and IoT-enabled moisture detection for healthcare and everyday use.

Project Overview

This innovative sensor is designed to detect moisture using conductive threads integrated into a fabric. Coupled with IoT technology, it provides real-time monitoring and alerts, making it ideal for a variety of applications.



Applications

- © Infant care: Diaper overflow detection
- 🏠 Healthcare: Monitoring bedridden patients
- 🏠 Home & Office: Spill detection on furniture

Get in Touch

Interested in collaboration or deployment?
Reach out to us for more details.

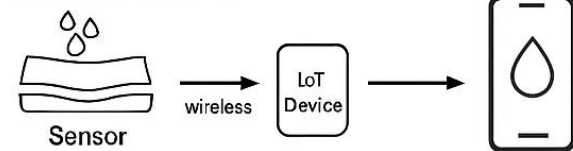
Objective

To develop a reusable, washable moisture detection sensor that offers real-time, remote monitoring capabilities at a low cost, without drawbacks of traditional moisture sensors.

Key Features

- ✓ Reusable and washable fabric sensor
- ✓ Foldable and easy to integrate
- ✓ IoT-enabled for remote monitoring
- ✓ Cost-effective and durable

How It Works



- 1 Liquid contacts the sensor fabric
- 2 Conductive threads bridge IO and Ground, allowing current to flow
- 3 An IO pin state changes from "1" to "0"

Reusable Wetness Detection Sensor

1. Overview

This project involves designing and implementing a reusable wetness detection sensor that can detect moisture or liquid spills using conductive threads embedded in fabric. The sensor is integrated with an Internet of Things (IoT) device for real-time monitoring and data transmission.

2. Objective

To develop a cost-effective, washable, and reusable sensor capable of detecting wetness due to liquids like water, urine, or coffee, especially useful in healthcare and infant care applications.

3. Background

Traditional wetness sensors use conductive electrodes or yarns and are often expensive and not reusable. Some change color when wet but lack digital integration. There is a need for a durable, affordable, and IoT-enabled sensor for continuous wetness monitoring.

4. Technical Description

The sensor comprises a fabric (e.g., cotton, rexine, rubber) embedded with conductive threads arranged in alternating Input/Output (IO) and Ground patterns. These threads are connected to GPIO pins of an IoT device. When liquid bridges the IO and Ground threads, the IO pin is pulled low, indicating wetness. The IoT device detects this change and transmits the data wirelessly.

5. Applications

- Healthcare: Detect diaper overflow in infants or bedridden patients.
- Smart Bedding: Monitor spills or moisture on beds or chairs.
- General Use: Detect accidental spills in homes or offices.

6. Features

- Reusable: Can be dried and reused.
- Washable: Fabric and threads are durable.
- Foldable: Easy to integrate into various surfaces.
- IoT Integration: Enables remote monitoring and alerts.

7. Methodology

1. Liquid Contact: Liquid reaches the sensor.
2. Conductive Path: IO and Ground threads are bridged.
3. Signal Change: IO pin changes from "1" to "0".
4. IoT Response: Device detects change and sends data.

8. Claims

- The sensor includes conductive threads stitched into fabric.
- Threads are connected to GPIO and ground of an IoT device.

- Sensor detects wetness via change in IO pin state.
- Method includes establishing a conductive path and determining wetness.

9. Abstract

A reusable wetness detection sensor integrates conductive threads into fabric and connects to an IoT device. It detects moisture by monitoring changes in electrical conductivity and transmits data wirelessly for real-time monitoring.

10. System Block Diagram (above)

Figure: Block diagram showing the sensor connected to an IoT device and mobile phone for real-time monitoring.