

FLOOD MONITORING & EARLY WARNING

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Deploying IoT sensors in flood-prone areas to measure water levels is a proactive approach to flood monitoring and management. To do this:

1.Select Sensor Type: Choose the appropriate water level sensors compatible with IoT technology. Ultrasonic sensors, pressure transducers, or capacitance sensors are commonly used for this purpose.

2.Sensor Placement: Install the sensors at strategic locations within the flood-prone areas, such as near rivers, streams, or floodplains.

3.IoT Connectivity: Configure the sensors to connect to an IoT network. This may involve using Wi-Fi, cellular, LoRa, or other suitable communication methods.

4.Data Transmission: Set up the sensors to regularly transmit water level data to a central server or cloud platform. Ensure data security and integrity.

5.Data Processing: Implement data processing algorithms to filter and analyze the incoming data for anomalies and flood potential.

6.Alert System: Develop an alert system that triggers notifications when water levels rise to a certain predefined threshold, indicating a potential flood event.

7.Integration: Integrate the sensor data with local weather information and other relevant data sources for a more comprehensive flood monitoring system.

IOT_Phase3

8. Monitoring and Maintenance: Regularly monitor the sensor network for functionality and perform maintenance as needed.

9. Community Outreach: Inform local authorities and communities about the system and its capabilities, so they can take timely actions in response to flood alerts.

10. Emergency Response Plan: Develop an emergency response plan that outlines actions to be taken when flood alerts are triggered, such as evacuation procedures and resource allocation.

This IoT-based flood monitoring system can greatly improve flood preparedness and response, potentially saving lives and reducing flood-related damages.

Python script on the IoT sensors to send collected water level data to the early warning platform.

```
import paho.mqtt.client as mqtt
```

```
import random
```

```
import time
```

```
# MQTT broker settings
```

```
mqtt_broker = "mqtt.eclipse.org" # Replace with your MQTT broker address
```

```
mqtt_port = 1883
```

```
# MQTT topic to publish to
```

```
mqtt_topic = "water_level"
```

```
# Initialize MQTT client
```

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```
client = mqtt.Client("WaterLevelSensor")
client.connect(mqtt_broker, mqtt_port)

try:
    while True:
        # Simulate collecting water level data (replace with real sensor data)
        water_level = round(random.uniform(0.0, 100.0), 2) # Simulated value
        between 0 and 100

        # Prepare the data payload
        payload = {
            "sensor_id": "sensor123", # Replace with your sensor ID
            "water_level": water_level,
            "timestamp": int(time.time())
        }

        # Publish the data to the MQTT broker
        client.publish(mqtt_topic, str(payload))
        print(f"Published data: {payload}")

        # Adjust the interval to your desired data sending frequency (e.g., every 5
        minutes)
        time.sleep(300) # 300 seconds (5 minutes)

except KeyboardInterrupt:
```

IOT_Phase3

```
print("Data publishing stopped.")
```

```
client.disconnect()
```