**Vermicomposting of Biodegrable Waste:**

**An Iot based Approach**

* Temperature Sensor: Measures the temperature within the compost pile. It helps ensure that the temperature remains in the optimal range for worm activity and decomposition.

**DS18B20 Temperature Sensor:**

- digital temperature sensor that is both accurate and water-resistant.

- It can operate in a wide temperature range, making it suitable for vermicomposting environments.

- compatible with microcontrollers like Arduino

**Thermocouple Temperature Sensor:**

- ability to measure high temperatures.

- can withstand the harsh conditions sometimes found in compost piles.

- However, thermocouples require an amplifier or specialized interface circuitry to work with microcontrollers and digital systems.

* Moisture Content Sensor: Provides precise information about the moisture levels within the compost pile, ensuring it doesn't become too wet or too dry.

**Tensiometers**

- Tensiometers measure the soil moisture by assessing the tension in the soil water.

- but they can be more expensive and may require more maintenance.

**Capacitive Soil Moisture Sensor**

- These sensors are widely used for measuring soil moisture.

- They are affordable, easy to use, and work well in soil-like mediums. Popular models include the FC-28 and the widely available SparkFun Soil Moisture Sensor.

* pH Sensor: Measures the acidity or alkalinity of the compost. Worms thrive in a specific pH range, so this sensor helps maintain the right conditions.

**Wireless pH**

- Some pH sensors come with built-in wireless capabilities (e.g., Bluetooth or Wi-Fi) for direct communication with IoT devices.

- These sensors may be more suitable for applications where you need real-time monitoring without additional wires

* Gas Sensors (e.g., CO2 and O2): These sensors help monitor gas levels within the compost, ensuring adequate oxygen for the worms and the breakdown of organic matter.

**Non-Dispersive Infrared (NDIR) CO2**

- NDIR sensors are highly accurate and commonly used for measuring CO2 levels.

- They work by analyzing the absorption of infrared light by CO2 molecules.

**Electrochemical O2 Sensor**

- These sensors are commonly used for measuring O2 levels.

- They work by generating a voltage that is proportional to the oxygen concentration.

* Aeration Sensor: Monitors airflow within the composting system, ensuring proper oxygen supply to the worms and microorganisms.
* Bacterial Growth: To detect disease or bacterial growth in compost.

Wireless Connectivity: Incorporating Wi-Fi, Bluetooth, or other wireless communication options allows these sensors to transmit data to a central control unit or a cloud platform for remote monitoring and control

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----Moisture sensors

More moisture 🡪 more current

So measure current analog then we convert into digital and send it into rasp

----Nutrients level for worms

----waterproof sensors

---- Esp32 camera <later>

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