



# IoT BASED SMART FARMING

Seyidhan YILMAZ<sup>1</sup>, Yusuf YUCESAN<sup>1</sup>  
Supervisor

Dr. Barış YÜKSEKKAYA<sup>1</sup>  
Hacettepe University, Electrical and Electronics Engineering<sup>1</sup>



Computing  
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Commission



## INTRODUCTION

- **Objective:** Implement IoT technologies to optimize agricultural practices
- **Sensors:** Soil moisture, temperature, humidity, and varying gas sensors
- **Connectivity:** Wireless communication via LoRa and WiFi, for data transmission
- **Data Processing:** Cloud-based platform (ThingSpeak by Mathworks) for data analysis and visualization
- **User Interface:** Mobile/desktop application for monitoring and control

## METHODOLOGY

### Electronic Architecture

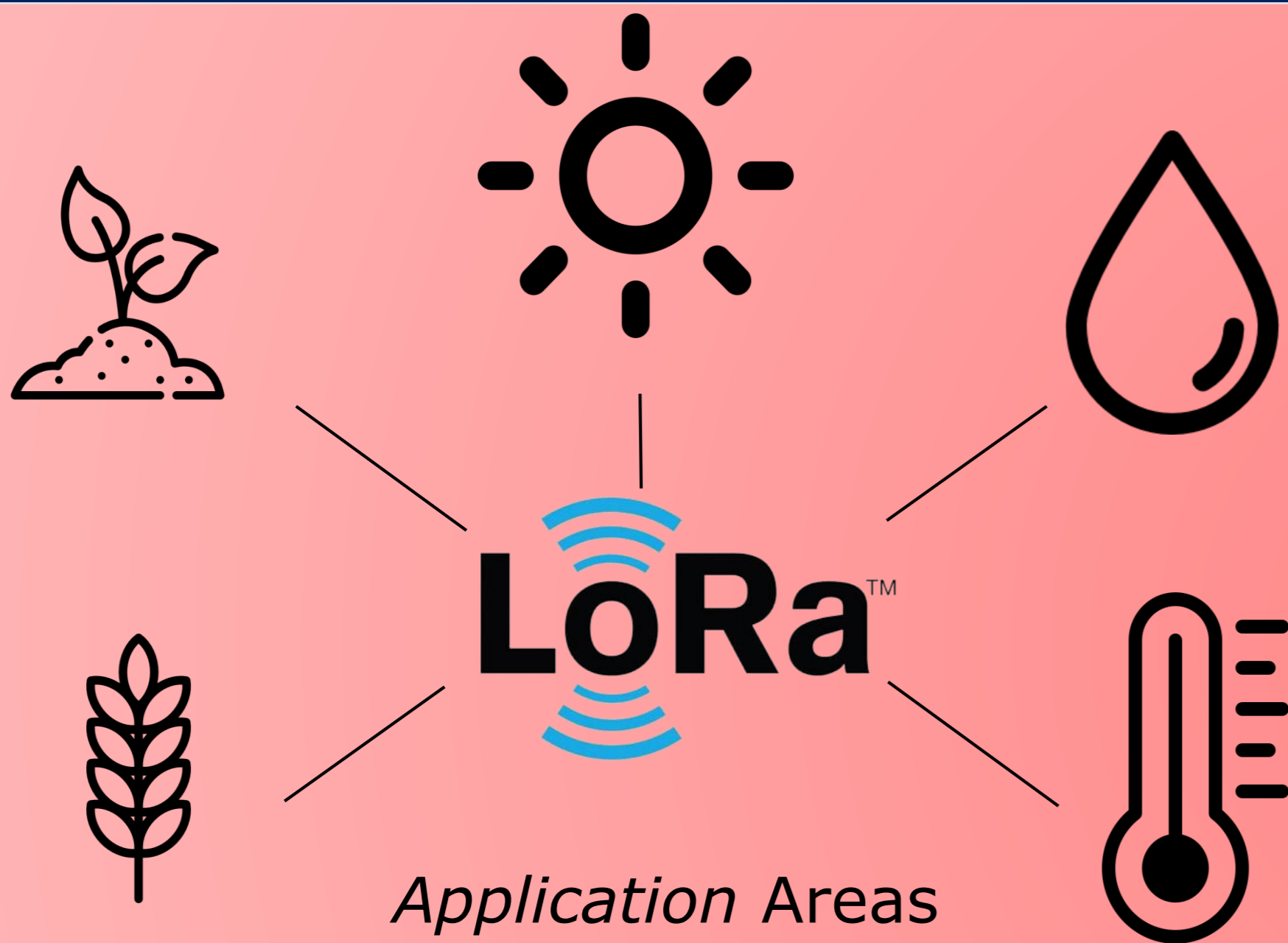
- **Sensors:** Moisture, temperature, humidity, gas sensors connected to Arduino Uno
- **Microcontroller:** Arduino Uno for data collection and transmission
- **Communication Module:** LoRa SX1278 module on Arduino for transmitting data
- **Receiver Side:** Raspberry Pi with LoRa receiver SX1278 to collect data
- **IoT Platform:** Via WiFi, Raspberry Pi sends data to the cloud-based platform for analysis

### Mechanical Architecture

- **Sensor Deployment:** Sensors embedded in the soil and environment

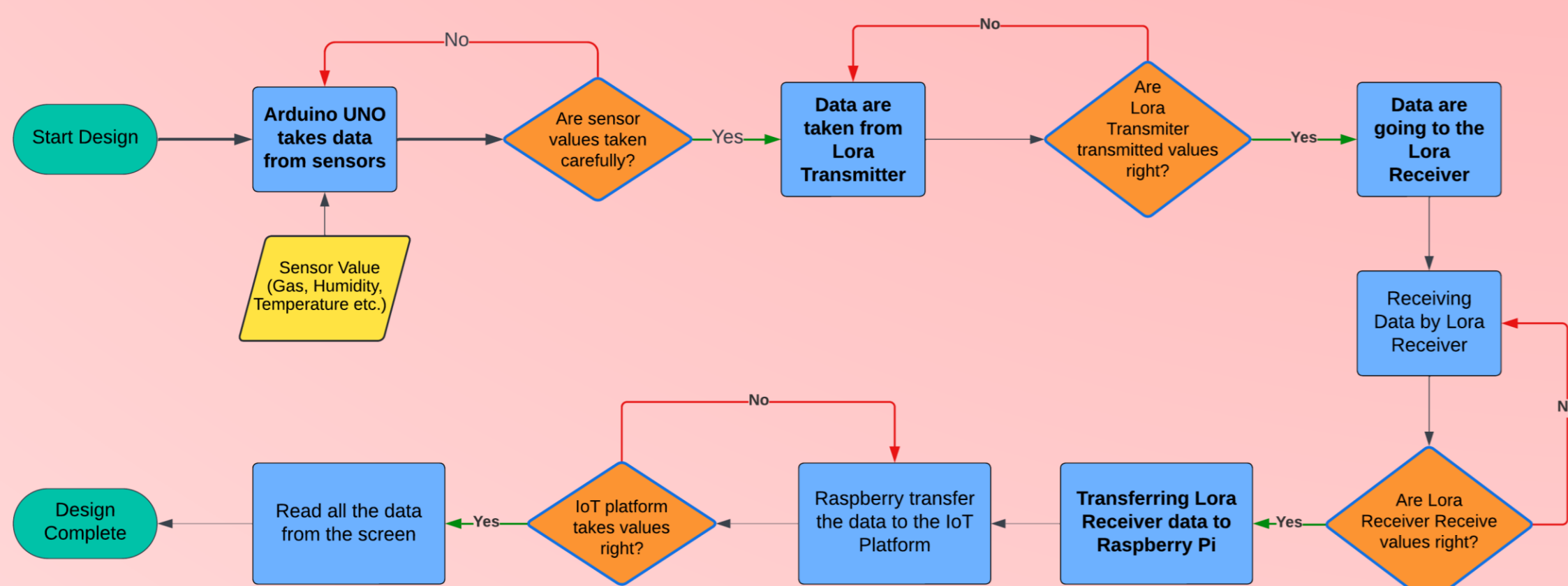
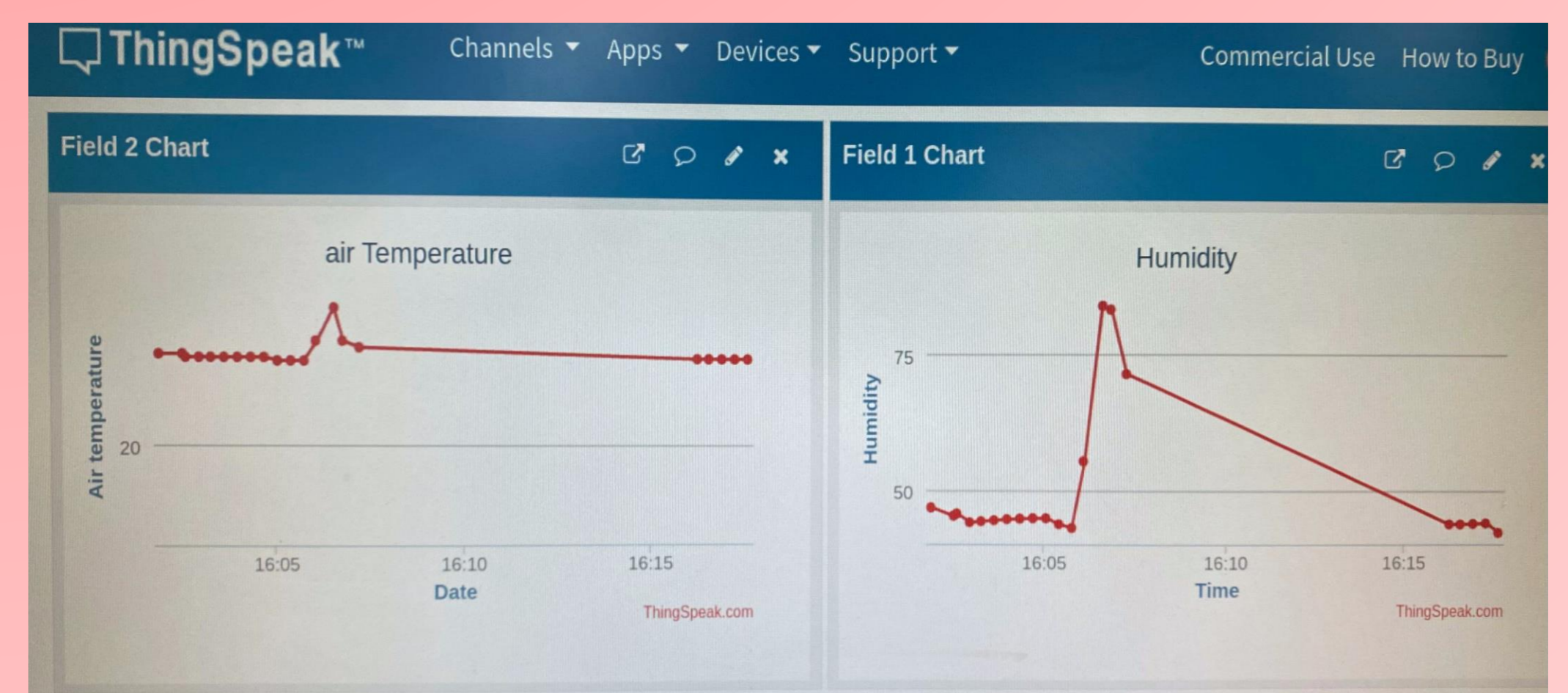
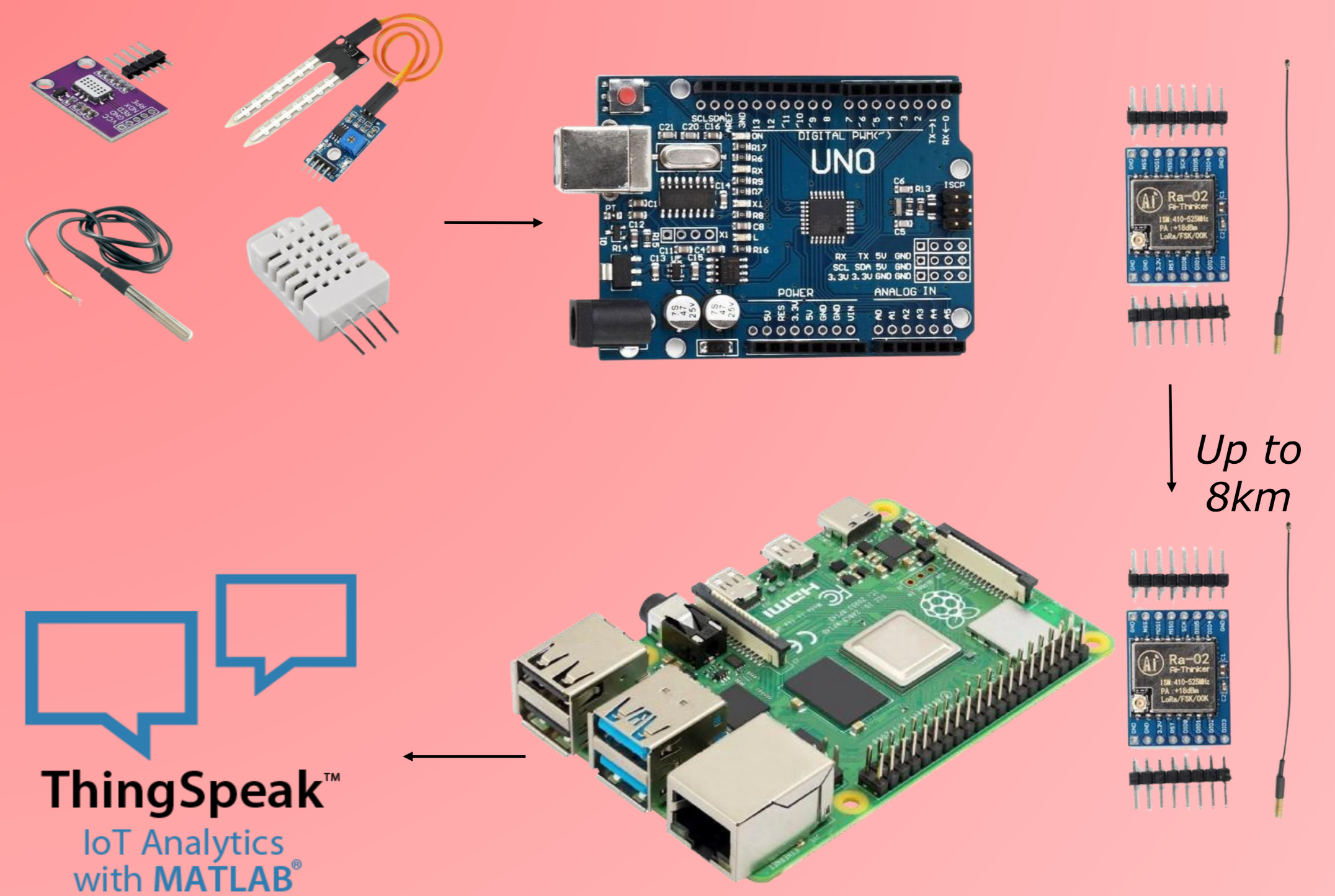
### Software Architecture

- **Arduino Software:** Code to read sensor data and transmit via LoRa
- **Raspberry Pi Software:** Python script to receive LoRa data and send to cloud
- **Cloud Platform:** Data storage, processing, and visualization



## APPLICATION AREAS

- **Efficiency:** Enhance resource usage (water and fertilizers) by precise monitoring
- **Yield Improvement:** Increase crop productivity through optimized growing conditions
- **Sustainability:** Promote sustainable farming by reducing waste and environmental impact
- **Scalability:** Applicable to various scales, from small farms to large agricultural enterprises
- **Automation:** Reduce labor costs and human error with automated systems
- **Decision Support:** Provide farmers with data-driven insights for better decision-making



Flowchart of the IoT System

## ACKNOWLEDGEMENTS

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