**Farzin sharifzadeh javidi,vahid ghasem zadeh, ali mosahebfard**

**Department of electrical engineering**

**Abstract**

The Internet of Things is revolutionizing agriculture by providing automated irrigation systems and real-time data monitoring. Farmers can use this technology to optimise water usage, save time, and boost crop yields while decreasing costs. Connected to a central hub through the internet, IoT sensors continuously monitor soil moisture levels, weather conditions, and other pertinent variables. The acquired data is analysed and used to autonomously control irrigation systems, ensuring that crops receive the appropriate amount of water at the appropriate time. Farmers can also access this data remotely, allowing them to make smart irrigation and crop management decisions. Overall, IoT-based irrigation systems provide a sustainable and efficient solution to modern agriculture's issues.

**Keywords :**

1. IoT
2. Automated irrigation systems
3. Real-time data monitoring
4. Agriculture industry
5. Water usage optimization
6. Crop yields
7. Cost reduction
8. Sensors
9. Soil moisture
10. Weather conditions
11. Remote access
12. Sustainable agriculture
13. Efficiency
14. Crop management
15. Data analysis.

**Introduction :**

Iran is a country that has faced severe water scarcity for decades, and with the changing climate, this has become an even more pressing issue. Agriculture is one of the major consumers of water, and with the increasing demand for food, the need for efficient water management in agriculture has become crucial. In this regard, the integration of IoT-based automated irrigation systems and real-time data monitoring can revolutionize the agriculture industry, allowing farmers to optimize water usage, increase crop yields, and reduce costs.

The use of IoT in agriculture involves the deployment of sensors and devices that collect data on various aspects of crop growth, such as soil moisture, temperature, humidity, and light intensity. This data is then analyzed to provide insights into crop health and growth patterns. With the help of automated irrigation systems, farmers can control the water supply to crops based on the real-time data, ensuring that the plants receive just the right amount of water they need.

The implementation of IoT-based automated irrigation systems in Iran can play a vital role in addressing the issue of water scarcity in the country. Iran has a dry and arid climate, with an average annual rainfall of only 250mm, which is much lower than the global average of 860mm. This has resulted in a shortage of water, particularly in rural areas where most of the agriculture is practiced. The available water resources are also being depleted rapidly, with groundwater levels falling at an alarming rate. This has led to a decline in crop yields and an increase in production costs, making it challenging for farmers to sustain their livelihoods.

By implementing IoT-based automated irrigation systems, farmers in Iran can overcome the challenges of water scarcity and improve crop management. The real-time data monitoring can help farmers to determine the optimum time for irrigation, based on the moisture levels of the soil and the weather conditions, ensuring that the crops receive the right amount of water at the right time. This can lead to a significant reduction in water usage, as well as an increase in crop yields and quality.

In conclusion, the integration of IoT-based automated irrigation systems and real-time data monitoring can bring about a revolution in the agriculture industry in Iran, allowing farmers to optimize water usage, increase crop yields, and reduce costs. The implementation of such systems can help address the issue of water scarcity in the country, which has become an increasingly pressing concern in recent years. By harnessing the power of technology, farmers in Iran can overcome the challenges posed by the dry and arid climate and ensure sustainable agriculture practices.

Python program

import serial

# Connect to the serial port

ser = serial.Serial('COM3', 9600) # Replace 'COM3' with the port your Arduino is connected to

# Read and print the data

while True:

data = ser.readline().decode().strip() # Read a line of data from the serial port

print(data) # Print the data

In this program, we first import the serial module, which allows us to connect to the serial port. We then create a Serial object, specifying the port and baud rate (9600 in this case) that our Arduino is connected to.

We then use a while loop to continuously read data from the serial port. We use the readline() method to read a line of data from the serial port, and then decode it to convert it from bytes to a string. We also use the strip() method to remove any leading or trailing whitespace.

Finally, we print the data to the console using the print() function. Note that you may need to modify the print() statement to format the data in a way that makes sense for your specific use case.