

# ***DESIGN OF AN AUTOMATIC WATERING SYSTEM FOR URBAN FARMING OF TOMATO PLANTS BASED ON THE INTERNET OF THINGS WITH ENVIRONMENTAL HUMIDITY AND TEMPERATURE SENSORS***

**DIKY AJIE ANDRIANA**

*Computer Engineering Study Program, Faculty of Science and  
Technology,*

*University of Technology Yogyakarta  
Jl. Ringroad Utara Jombor Sleman Yogyakarta  
E-mail : [dikyajie91@gmail.com](mailto:dikyajie91@gmail.com)*

## ***ABSTRACT***

*This research aims to design and implement an automatic watering system for tomato cultivation in an urban farming environment using Internet of Things (IoT) technology. This system uses a NodeMCU ESP8266 microcontroller integrated with a soil moisture sensor to detect soil moisture and a DHT11 sensor to read temperature and air humidity. Based on sensor data, the system can automatically activate or deactivate the water pump if the soil moisture falls below a threshold of 60%. Sensor readings are sent in real time to the Node-RED platform for monitoring and are also automatically saved to Google Sheets for historical records. Furthermore, the system sends watering notifications to users via the Telegram application. Testing shows that the system can work effectively in controlling watering and is efficient in water use. This research demonstrates the potential of IoT applications for smart farming in urban environments.*

***Keywords: Internet of Things, Automatic Watering, Urban Farming, Tomato Plants, Node-RED, Soil Moisture, ESP8266***