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## Patent Search

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### Inventor

Name	Address	Country
A Vijay Kumar, Assistant Professor / Department of Computer Science, University Post Graduate College, Osmania University.	University Post Graduate College, Osmania University, Secunderabad, Hyderabad, Telangana-500003.	India
B Narender, Assistant Professor / Department of Computer Science, University Post Graduate College, Osmania University.	University Post Graduate College, Osmania University, Secunderabad, Hyderabad, Telangana-500003.	India
Rakhesh K, Assistant Professor / Department of CSE, Jayaprakash Narayan College of Engineering.	Jayaprakash Narayan College of Engineering, Dharmapur, Mahabubnagar, Telangana-509001.	India
Dr. K. Guru Raghavendra Reddy, Assistant Professor & HOD / Department of CSE, Jayaprakash Narayan College of Engineering	Jayaprakash Narayan College of Engineering, Dharmapur, Mahabubnagar, Telangana-509001.	India
Dr. Animoni Nagaraju, Associate Professor / Department of Mathematics and CSE, Malla Reddy Institute of Technology and Science.	Malla Reddy Institute of Technology and Science, Maisammaguda, Dhullapally, Hyderabad, Telangana-500100.	India
K. Radhika, Associate Professor / Department of CSE, Jayaprakash Narayan College of Engineering.	Jayaprakash Narayan College of Engineering, Dharmapur, Mahabubnagar, Telangana-509001.	India
A. Swathi, Assistant Professor / Department of CSE, Jayaprakash Narayan College of Engineering.	Jayaprakash Narayan College of Engineering, Dharmapur, Mahabubnagar, Telangana-509001.	India
P Annapurna, Assistant Professor / Department of ECE, Institute of Aeronautical Engineering.	Institute of Aeronautical Engineering, Dundigal, Hyderabad, Telangana-500043.	India

### Applicant

Name	Address	Country
A Vijay Kumar, Assistant Professor / Department of Computer Science, University Post Graduate College, Osmania University.	University Post Graduate College, Osmania University, Secunderabad, Hyderabad, Telangana-500003.	India
B Narender, Assistant Professor / Department of Computer Science, University Post Graduate College, Osmania University.	University Post Graduate College, Osmania University, Secunderabad, Hyderabad, Telangana-500003.	India
Rakhesh K, Assistant Professor / Department of CSE, Jayaprakash Narayan College of Engineering.	Jayaprakash Narayan College of Engineering, Dharmapur, Mahabubnagar, Telangana-509001.	India
Dr. K. Guru Raghavendra Reddy, Assistant Professor & HOD / Department of CSE, Jayaprakash Narayan College of Engineering	Jayaprakash Narayan College of Engineering, Dharmapur, Mahabubnagar, Telangana-509001.	India
Dr. Animoni Nagaraju, Associate Professor / Department of Mathematics and CSE, Malla Reddy Institute of Technology and Science.	Malla Reddy Institute of Technology and Science, Maisammaguda, Dhullapally, Hyderabad, Telangana-500100.	India
K. Radhika, Associate Professor / Department of CSE, Jayaprakash Narayan College of Engineering.	Jayaprakash Narayan College of Engineering, Dharmapur, Mahabubnagar, Telangana-509001.	India
A. Swathi, Assistant Professor / Department of CSE, Jayaprakash Narayan College of Engineering.	Jayaprakash Narayan College of Engineering, Dharmapur, Mahabubnagar, Telangana-509001.	India
P Annapurna, Assistant Professor / Department of ECE, Institute of Aeronautical Engineering.	Institute of Aeronautical Engineering, Dundigal, Hyderabad, Telangana-500043.	India

**Abstract:**

Abstract While traditional farming practices are combined with cutting-edge statistics skills like the IoT, cloud storage, and AI to create smart agriculture, new threats, vulnerabilities in this area's information infrastructure have emerged. To address the needs of low-power IoT devices, this study suggests incorporating lightweight cryptographic solutions into the improved agricultural IoT ecosystem. We also look into using a compact encryption protocol, the Efficient and cost-effective Cipher (X-cipher), which provides an encrypted channel between the sensing element and the operator in the Data transmission, and amongst the broker and its clients. The MQTT protocol serves by software communication procedure in intelligent irrigation systems, which is the subject of our test case. By optimizing water use in agriculture, "smart irrigation" aims to reduce the waste of scarce water resources. Furthermore, by preventing eavesdropping, theft, and unauthorized alterations to sensitive information that can adversely affect the development of crops, this secure channel addresses the primary security issue in precision farming. Also, the secure channel safeguards the data analytics (DA) and irrigation options on the irrigation period and the amount of freshwater that would be reverted to actuators. According to our enactment assessment, our preferred encryption procedure uses less energy, runs faster, and needs less memory compared to the standard mentioned above. The chosen lightweight encryption method consumes better throughput and memory than the CURRENT lightweight encryption method.

**Complete Specification**

Description: A Cutting-Edge IOT-Based Irrigation System Secured by the Expeditious Cipher for Optimal Crop Growth

**Field and Background of the Invention**

Many obstacles have inspired a rise in intelligent agricultural research investigations. The first is the rapid increase in the global population. The UN Food and Agriculture Organization estimates that by 2050, global food demand will have increased by as much as 70 percent. Second, we are running out of fresh water, arable land, and natural resources in short supply. Another factor is the worldwide decline in the availability of farm workers. Because of this scarcity of farm workers, there is a pressing need to implement Internet of Things (IoT) solutions into agricultural processes. Internet of Things solutions help farmers reduce the demand-supply gap. Farmers incorporating wireless sensor networks (WSNs) into their practices increasing harvest success. To assure a decrease in the potential intimidation to the manufacturing operation and aid farmers in making improved decisions, an extensive collection of multi-function with wireless technology where sensors are used to display various agricultural and obtain data from the environment and crop development and farm animals' health data. The Internet of Things (IoT) has recently surpassed WSNs as a primary enabling technology for sustainable farming. The Internet of Things is a hybrid system that combines technologies like RFID, WSN, MDM, EA, and the cloud. Moreover, smart agriculture is an improved agricultural solution that uses IoT skills to distantly receive data from sensors embedded in agriculture types of terrain to analyze various soil aspects throughout all stages.

Groundwater is a limited resource in many nations. Based on the data, we gathered decisions about when and how much water should be used for irrigation. Recent studies on IoT-grounded targeted irrigation arrangements are summarized, emphasizing the underlying inter-process communication, business intelligence, and security.

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