**Tentative Outline**

**Special Thematic Issue for the journal : International Journal of Sensors, Wireless Communications and Control**

**Title of the Thematic Issue: Artificial Intelligence of Things (AIoT) for Smart Agriculture**

***Guest Editors: Dr. Divya Upadhyay***

- **Scope of the Thematic Issue:**

Nowadays, climate change and increasing population are the most critical issues the world is facing. These issues are also challenging the world's management of food supply. An innovative and pioneering group of scientists are turning to advanced Artificial Intelligence and Internet of things tools to build solutions. This special issue aims to gather recent and innovative research on emerging discoveries in the convergence of Artificial Intelligence (AI) & Internet of Things (IoT) methods for analyzing, processing, and storing the data generated by AIoT based agricultural infrastructures. The special issue aims to include recent advancements in exploring and developing AIoT-powered strategies and mechanisms for future agriculture applications and architectures to help farmers in improving agricultural tasks.

Further, the issue also addresses current research trends, innovative technological developments, and current industrial needs. It will also introduce case studies, various experiences and evaluation reports, and best practices for utilizing AIoT applications in precision agriculture. This will strike a good balance between theoretical and practical aspects of AIoT issues. It will also provide technical and scientific information on AIoT technologies, ranging from basic concepts to research-grade material and future directions.

- **Background & Rationale:**

With the development of innovative and intelligent sensors media, the internet of things, and artificial intelligence, "Smart Agriculture" is obtaining extraordinary attention from academia, government, industries, researchers, and the various agricultural communities. In recent times, the Internet of Things (IoT) has converted an innovative vision world into reality with substantial data and numerous services. On the other hand, Artificial Intelligence fits very well with IoT and enables high-level cognitive processes like perceiving, thinking, problem-solving, learning, and decision-making capabilities. Combined with developments in analytics and computer processing power, data collection, and aggregation, AI presents various opportunities to supplement and complement human intelligence and enrich the way people live, operate, and work. AIoT holds on the promise of leading and driving a significant food revolution to meet the increased demand for global food (globally, nations need to produce 50% more food to cater to an additional two billion people by the mid of 2050 compared with today). AIoT can also address challenges, including lack of assured irrigation, inadequate demand and prediction, and overuse or misuse of fertilizers and pesticides. Some use-cases include an advanced detection of pest attacks, improved crop yield through a real-time advisory system, and early prediction of crop prices to inform sowing practices. By 2025 AIoT will have a major and significant global impact on agricultural productivity at all levels of the value chain. Estimation given by Markets and Markets Research valued through a survey that AI technology in the agriculture industry is $ 432 million in 2016 and is expected to grow at 22.5% CAGR to be valued at $ 2.6 billion by 2025.

While researchers are making many advancements for the study of convergence of AI & IoT to AIoT, very little consideration and attention have been given to the incorporation of this technology in developing low-cost, effective, and affordable, smart & intelligent devices and methods for various agriculture services. This convergence of the AI-IoT for smart agriculture has the potential to revolutionize many aspects of society at various levels. However, before the prospect of AIoT intersection is realized, many technical and procedural challenges need to be addressed. Some of these challenges include using the combined potential of IoT and AI or deploying this technology for providing smart agricultural services and solutions. Another significant challenge is using AIoT to assist farmers and farms at the right time and in the right place. IoT-AI convergence also needs to address big data analytics to facilitate agricultural data representation, storage, analysis, and integration for effective and intelligent agrarian solutions.

**Keywords:** Internet of Things, Smart Agriculture, Artificial Intelligence, Sensor Network, Precision Agriculture. Artificial Intelligence of Things, Edge Computing, Cloud Computing

## Sub-topics:

The sub-topics to be covered within the issue are:

- Classification and Innovative techniques and testbeds for AIoT enable connected agriculture
- Enabling convergence of AIoT technologies for Smart Agriculture
- Cognitive Computing and Big Data Analytics for Smart Agriculture
- Energy-efficient Data Offloading and Computing over AIoT for Smart Agriculture
- Low-Cost Data Offloading and Computing over AIoT for Smart Agriculture
- Agriculture IoT and big data analytics
- AIoT for human activity monitoring
- AIoT for animal activity monitoring
- Situation Understanding Context-aware for Smart Agriculture
- Deep Learning algorithm and approaches for Smart Agriculture
- Security and Privacy issues on integration of AI and IoT for Smart Agriculture
- Dynamic resource provisioning on AIoT for mobile Agriculture
- Algorithms, Techniques, and methods of analyzing and processing smart Agriculture data over the AIoT
- AIoT supported for Smart agricultural care

## Tentative titles of the articles

According to the consent received by the authors, please find below the tentative titles to be submitted in special issue along with the list of contributors.

1. Lite Deep Learning Framework for efficient reasoning and inferencing in AIoT-based devices for Smart Agriculture

2. Low-Cost Data Offloading and Computing over AIoT for Smart Agriculture

3. Cognitive Aspects and Computing Methods for Smart Agriculture

4. Optimized Cloud-based data processing architecture for Intelligent Devices in Agriculture

5. Situation Understanding Context-aware for Agriculture Automation

6. Advanced Big Data analytic approaches in Agriculture

7. Intelligent framework for maintaining Agriculture Production

## Schedule:

**Thematic issue submission deadline: 01st Nov 2022.**

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