IEEE IoT Journal Special Issue on

Integrating Cognitive IoT Sensors with UAVs in Aerial Computing - Next Generation Industrial Systems

Aerial Computing is a new paradigm that merges the amalgamation of aerial radio access networks and edge computing. However, the studies on aerial computing with cognitive IoT devices, UAVs, and decisive machine learning are very limited. Aerial computing is a novel computational method comprising low-altitude computing (LAC) and high-altitude computing (HAC). It yields a technique that enables local data analysis, real-time service and increases communication accuracy where the conventional UAVs face limitations. Regarding the existing devices (i.e., IoT devices and UAVs), data transition and cooperation among IoT devices and UAVs in small areas takes place in the low altitude while data transition and cooperation in large areas takes place in the high altitude of aerial computing. Existing studies have specified that aerial computing techniques face various challenges such as energy efficiency, efficient resource management, and network stability. On other hand, Cognitive Internet of Things (CIoT) sensors are high-tech sensing devices that adopt artificial intelligence (AI) and machine learning (ML) paradigms to capture and realize real-time data from various sources. Hence, we wish to apply cognitive IoT devices, UAVs, and AI systems to overcome the challenges in next generation industrial systems engineering. The IoT devices have the issue of overcoming problems such as batteries, transmission power, and processing capacity to emerge the in-coming 6G network in industrial systems. UAVs have issues such as limited or absence of network connectivity, limited visual range, spread of the search zone, absence of GPS signal in low and high altitudes.

Subsequently, CIoT gateway framework's development is the other issue that will be capable of integrating information transmitted from various intelligent IoT devices and running various machine and deep learning algorithms for decision making and disseminating this useful information. To address these aforementioned problems, this special issue will explore advances in CIoT devices design, sensor system architectures, UAV navigation, UAV localization, and non-image data analysis. We aim to bridge the gap between IoT and UAV technology research for the next generation industrial systems. Finally, this issue will also highlight progress in machine learning for decisive neural network and sensor data processing to improve the ability of the aerial computing systems. Thus, within the scope of this special issue the following aspects are of particular importance but not limited to them. Original research contributions and review papers are sought in the following areas, including (not limited to):

- Development of cognitive IoT devices.
- Aerial computing for large-scale IoT systems
- AI-Enabled aerial computing & Application of edge/fog/cloud computing in UAV
- Software-Defined Networking and virtualization technology in Aerial Computing
- UAV's navigation and localization and sensor architecture for adaptive/automatic calibration
- UAV systems among sensor technologies for spatial environment perception
- UAV Collaborative sensing to enhance the smartness and robustness of sensing systems, (6G and beyond 6G)
- Cognitive AI-enabled solutions for drone detection, recognition, and classification
- Implementation/testbed/deployment of Cognitive IoT sensors in aerial computing
- Orchestration across communication, computation, caching, sensing, and control for aerial computing

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Submission Guidelines:

All original manuscripts or revisions to the IEEE IoT Journal must be submitted electronically through IEEE Manuscript Central, http://mc.manuscriptcentral.com/iot. When the authors reach the "Article Type" step in the submission process, they should select **SI: CIoT with UAV in Aerial Computing - Next Generation Industrial Systems.** Solicited original submissions must not be currently under consideration for publication in other venues. Author guidelines and submission information can be found at http://ieeeiotj.org/guidelines-for-authors/.