Guest Editorial on Special Issue Part II: Radio Frequency Identification (RFID), Sensing and Imaging

As the demand for low cost, flexible, and power-efficient broadband wireless electronics increases, materials and integration techniques become critical and face more challenges, especially with the ever growing interest for "cognitive intelligence" and wireless applications, married with RF identification (RFID) technologies. This demand is further enhanced by the need for inexpensive, reliable, and durable wireless RFID-enabled sensor nodes, driven by applications such as logistics, aero identification (aero-ID), anti-counterfeiting, supply-chain monitoring, space, healthcare, and pharmaceutical, and is regarded as one of the most disruptive technologies to realize truly ubiquitous ad-hoc networks.

Over the last decade RFID-enabled sensing systems have received an increasing level of attention due to their relative simple system architecture, that consist of simple sensing tags and interrogation readers facilitating their integration with other existing Wireless Sensor Networks (WSN) and RFID infrastructure. Integrating sensors with the RFID tags renders the whole system capable of not only tracking, but also providing real-time cognition of aspects of its status or its environment (e.g., storage conditions of perishable items, such as food). The ultimate goal is to create an easily deployable and rugged intelligent network of RFID-enabled sensors encompassing active (battery-enabled), semi-active (batteryless/energy harvesting) and passive architectures. RFIDs can constitute low-power wireless platforms with broad sensing capabilities including temperature, gas, strain and humidity sensing. Electronics utilizing low-power RFID- enabled motion sensors can be turned on at user's presence or need, which leads to energy saving. Such sensor systems can be used as a smart skin for strain, ambient conditions and biomonitoring sensing applications or a bio-monitoring sensor as well as a Machine-to-Machine (M2M) communication node. RFID-enabled sensor systems could potentially be one of the most enabling factors to implement realistic large-scale topologies of Internet of things (IoT) in the future.

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