The Industrial Internet of Things

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The growth of the Internet of Things (IoT) is making a major impact in many fields, in particular in industrial settings. Therefore, the Industrial Internet of Things (IIoT) is often encountered in manufacturing, referring to the industrial subset of IoT. Specifically, IIoT is a new ecosystem that combines intelligent and autonomous machines, advanced predictive analytics, and machine-human collaboration to improve productivity, efficiency, and reliability. It brings about a world where smart, connected embedded systems and products operate as part of a larger complex system.

Similar to IoT, IIoT connects billions of mobile devices, manufacturing machines, industrial equipment, and many other industrial components/devices. Such an environment generates an unprecedented volume of industrial data. This big data can consume much of the network bandwidth and increase latency when moving such big data from the industrial local network edge to a central data center. In turn, IIoT with a centralized data center may not have the ability to support prompt data analysis for a multitude of applications. To solve this issue, edge computing has been proposed to connect IIoT devices and their remote data centers.

This Special Issue brings together researchers in the field to present their technical findings and provide possible solutions/directions to the challenges faced in this area. They also share recent results related to IIoT and big data, network latency, and bandwidth as well as investigate IIoT-enabled smart applications in terms of self-monitoring, self-diagnosing, self-healing, self-directing, and so on. Integrating intelligence into the edge is a promising development trend. Therefore, applying machine learning is expected to serve and support the emerging edge computing frameworks in IIoT. The authors of the 14 accepted papers in this Special Issue present and highlight the advances and the latest intelligent technologies, implementations, and applications in the field of edge-based IIoT. This is expected to move the theoretical and practical frontiers forward for a better understanding of this evolving field.

Many thanks to the efforts of the Guest Editors of this Special Issue: Song Guo, Kun Wang, Giovanni Pau, and Ammar Rayes. I strongly believe that this is a very interesting topic, and I am confident that you will find many of the articles very useful in your future research.

Your suggestions are always welcome.