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Guest editorial: AI-enabled software-defined industrial networks: Architectures, algorithms, and applications

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Abstract

The papers in this special section focus on artificial intelligence-enabled software defined industrial networks. With the development of intelligent manufacturing, new manufacturing modes such as personalized customization and networked collaboration have been widely developed. These new manufacturing modes require frequent data exchanges between manufacturing machines and industrial information systems through the networks, and dynamically change according to the variations of orders, business, and environments, which cannot be supported in traditional manufacturing modes that focus on local and fixed processes. The current industrial network architecture cannot meet the needs of the aforementioned upcoming manufacturing mode. For example, there are many industrial network protocols, forming a complex industrial heterogeneous network, which seriously affects the interconnections between the underlying devices and the upper layer application systems. In addition, the layering information technology (IT) networks and the operation technology (OT) networks in the factory have hindered the developments of the industrial networks and intelligent manufacturing. There is an urgent need to build a flat, efficient, and flexible industrial network to support the new manufacturing modes.