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Smart Manufacturing and Tactile Internet Powered by 5G: Investigation of Current Developments, Challenges, and Future Trends

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Abstract

Communication latency has been a significant barrier for many applications deployed in manufacturing networks. Despite the constant development of improved communication protocols and standards during Industry 4.0, the latency problem still exists, decreasing the Quality of Services (QoS) and Quality of experience (QoE). Therefore, high availability, security and ultra-low latency offered by Tactile Internet (TI), will create a new dimension to human-to-machine interaction (HMI) by enabling haptic and tactile sensations. The 5G mobile communication systems will support this emerging Internet at the wireless edge. Consequently, TI can be used as backbone for delay mitigation in cooperation with 5G networks, for ultra-reliable low-latency applications such as Smart Manufacturing, Virtual and Augmented Reality. Therefore, the aim of this paper is to present the state-of-the-art of 5G and TI, the challenges, the trends for 5G networks beyond 2020 and to provide a conceptual framework integrating 5G and TI to existing industrial case studies.

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