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Disruptive Trends in Automation Technology

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The industrial sector is being transformed by the convergence of information technology and operational technology. The latter is another name for automation technology and covers established systems such as supervisory control and data acquisition (SCADA), programmable logic controllers (PLC), fieldbuses, and automation and control systems. As this technology is connected to the Internet and 5G networks, some monitoring, control, and analytic functionalities are deployed to the edge or cloud, and researchers are challenged to ensure the security, dependability, real-time performance, and maintainability of the resulting systems. The big data that is accessible from these systems create opportunities for artificial intelligence applications that can further disrupt the established practices in the automation domain. For example, reinforcement learning is emerging as an alternative technology for industrial process control and optimization, and machine learning is heavily applied to fault diagnostic and predictive maintenance. Real-time connectivity, cloudification, big data, and artificial intelligence are all driving the transformation of conventional simulators to digital twins.



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