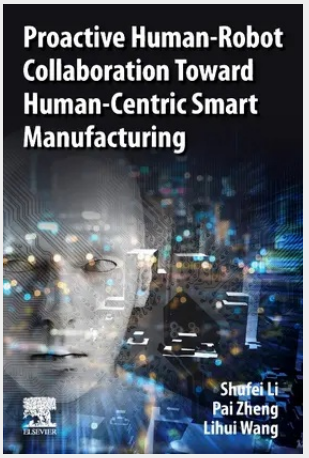
Li / Zheng / Wang

Proactive Human-Robot Collaboration Toward Human-Centric Smart Manufacturing



Proactive Human–Robot Collaboration Toward Human-Centric Smart Manufacturing is driven by an appreciation of manufacturing scenarios where human and robotic agents can understand each other's actions and conduct mutual-cognitive, predictable, and self-organizing teamwork. Modern factories' smart manufacturing transformation and the evolution of relationships between humans and robots in manufacturing tasks set the scene for a discussion on the technical fundamentals of state-of-the-art proactive human–robot collaboration; these are further elaborated into the three main steps (i.e., mutual-cognitive and empathic coworking; predictable spatio-temporal collaboration; self-organizing multiagent teamwork) to achieve an advanced form of symbiotic HRC with high-level, dynamic-reasoning teamwork skills. The authors then present a deployment roadmap and several case studies, providing step-by-step guidance for real-world application of these ground-breaking methods which crucially contribute to the maturing of human-centric, sustainable, and resilient production systems. The volume proves to be an invaluable resource that supports understanding and learning for users ranging from upper undergraduate/graduate students and academic researchers to engineering professionals in a variety of industry contexts.

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