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347 Six-Sigma Quality Management of Additive Manufacturing
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377 Artificial-Intelligence-Driven Customized Manufacturing Factory: Key Technologies, Applications, and Challenges
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|INVITED PAPER| This article presents the architecture of an AI-driven customized smart factory, showcasing intelligent manufacturing devices, intelligent information interaction, and construction of a flexible manufacturing line.

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By T. Cerquitelli, D. J. Pagliari, A. Calimera, L. Bottaccioli, E. Patti, A. Acquaviva, and M. Poncino
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423 Learning-Based Automation of Robotic Assembly for Smart Manufacturing
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The cover illustration of a smart factory that utilizes robots to perform tasks with little or no human interaction aptly captures the theme of this month's issue.

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|INVITED PAPER| Based on the analysis of literature approaches and real-world use cases, this article identifies and discusses the main challenges that need to be faced for a tight integration of control and wireless communication in smart manufacturing.

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|INVITED PAPER| This article discusses the challenges of smart manufacturing based on artificial intelligence and information communication technology from a wireless networking perspective.

495 A Survey of Cybersecurity of Digital Manufacturing
By P. Mahesh, A. Tiwari, C. Jin, P. R. Kumar, A. L. N. Reddy, S. T. S. Bukkapatanam, N. Gupta, and R. Karri

|INVITED PAPER| This article presents and discusses the cybersecurity risks in the emerging digital manufacturing (DM) context, assesses the impact on manufacturing, and identifies viable approaches to secure DM.

517 A Unified Architectural Approach for Cyberattack-Resilient Industrial Control Systems
By C. Zhou, B. Hu, Y. Shi, Y.-C. Tian, X. Li, and Y. Zhao

|INVITED PAPER| This article deals with the cybersecurity issues posed by the Industry 4.0 era, with specific regard to industrial control systems (ICSs), and presents a unified architectural approach to proactively address these issues.

542 (Re)deployment of Smart Algorithms in Cyber–Physical Production Systems Using DSL4hDNCS
By B. Vogel-Heuser, E. Trunzer, D. Hujo, and M. Sollfrank

|INVITED PAPER| This article addresses the redeployment of intelligent algorithms and learning for evolving smart cyber–physical production systems (CPPSs) with a comprehensive domain-specific language (DSL), DSL4hDNCS.

556 A Methodology for Digital Twin Modeling and Deployment for Industry 4.0
By G. N. Schroeder, C. Steinmetz, R. N. Rodrigues, R. V. B. Henriques, A. Rettberg, and C. E. Pereira

|INVITED PAPER| This article focuses on the digital twin (DT), one of the key concepts of Industry 4.0, and proposes a methodology for DT design using model-driven engineering (MDE) that strives toward being both flexible and generic.

568 A Connective Framework to Support the Lifecycle of Cyber–Physical Production Systems
By R. Harrison, D. A. Vera, and B. Ahmad

|INVITED PAPER| This article envisions a connective framework to support the engineering of cyber–physical production systems (CPPSs) in smart manufacturing through the use of a set of digital twins consistent with the real system throughout its lifecycle.

582 A Platform Programming Paradigm for Heterogeneous Systems Integration
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|INVITED PAPER| This article revisits the programming paradigm that is currently used for lock-free multicore programming and explains its extension to the system level, exploring its application to two important developments in industrial design.

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