

AI challenges and applications in Industry: From framework to deeper data associativity and interoperability

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Abstract— This presentation is about Artificial Intelligence (AI) challenges and applications in the context of industry engineering management, from an angle of engineering informatics. Network based resources collaboration is becoming an essential business strategy in critical global projects. Keeping the industrial competitiveness depends on the emerging technologies over the big-data intelligence, algorithms, high speed internet, especially the cyber-physical systems, and deep-collaboration in ever more integrated and yet conflicting environment. Thematic review of machine learning and modern AI technologies in engineering informatics field is to be presented. The contents mainly focus on data associativity and deep interoperability among applications. Hopefully, the proposed collaborative AI approach will generate meaningful discussion about new technology, business and education changes in the coming years.

Keywords— Network-oriented engineering management; Industry 4.0; Artificial Intelligence in Engineering; Deep-reasoning; Value-chain



Dr. Yongsheng Ma has been a full professor at Southern University of Science and Engineering in Shenzhen, China since July, 2021. Before that he had been a full professor at University of Alberta where he had joined since 2007. Dr. Ma is also a member of ASME, ASEE, SME, SPE, CSME and an Alberta registered Professional Engineer (P.Eng.). His main research areas include engineering informatics for design and manufacturing, CAD/CAM, and product lifecycle management. Dr. Ma received his B.Eng. from Tsinghua University, Beijing (1986), both [M.Sc.](#) (1990) and Ph.D. (1994) from UMIST, UK. In 2000-2007, he was an associate professor with Nanyang Technological University, Singapore. Dr. Ma started career as a Ngee Ann Polytechnic lecturer in Singapore (1993); and then a senior research fellow and group manager (1996-2000) at Singapore Institute of Manufacturing Technology. Dr. Ma has published more than 200 internationally recognized top journal and conference papers, and two specialty books. Dr. Ma had been an associate editor of *IEEE Transaction of Automation Science and Engineering* (2009-2013). In 2012, he won the prestigious ASTech award sponsored by The Alberta Science and Technology Leadership Foundation together with Drader Manufacturing Ltd. Dr. Ma had been engaged for collaboration with many academic institutions and industrial partners internationally. 2019-2020, Dr. Ma had been a visiting professor of SUSTech (China). Since 2020, Dr. Ma has become an associate editor for *Advanced Engineering Informatics* (Elsevier), *ASME Journal of Computer Information Science and Engineering* (JCISE), and *Frontiers in Mechanical Engineering – Digital Manufacturing* (Frontiers, open access). He also serves as an Editorial Member for Scientific Reports published by Springer Nature.,