Control and Optimization of process Industries in the AI Era: Driven by Demand to Promote Intelligent Transformation

Professor Jinliang Ding 丁进良

Northeastern University

Abstract

The control and optimization of process industries in the AI era face enormous challenges. How to meet challenges and achieve the intelligent transformation of control disciplines is a widely concerned issue. From the perspective of the national strategy for intelligent process industry, there is an urgent need for intelligent upgrading and transformation in control and optimization. Driven by the actual demand for industrial intelligence, this report introduces the progress made in combining control and optimization with artificial intelligence. The purpose is to deepen the discussion and broaden our thinking by throwing bricks, and to meet the challenges brought by AI.

Jinliang Ding is currently a Professor with the State Key Laboratory of Synthetical Automation for Process Industries, Northeastern University. He has authored or coauthored over 200 refereed journal and international conference papers, and has invented or coinvented more than 50 patents. His research interests include modeling, plant-wide control and optimization for the complex industrial systems, machine learning, industrial artificial intelligence, computational intelligence, and its application.

Dr. Ding has received numerous awards, including the Young Scholars Science and Technology Award of China (2016), the National Science Fund for Distinguished Young Scholars (2015), the National Technological Invention Award (2013), the Natural Science Award of Liaoning Province (2022), and the First-Prize of Science and Technology Awards from the Ministry of Education in 2006, 2012, and 2018. Additionally, one of his articles in Control Engineering Practice won the Best Paper Award for 2011 – 2013. He also serves as an Associate Editor for IEEE Transactions on Evolutionary Computation, IEEE Transactions on Emerging Topics in Computational Intelligence, and IEEE Transactions on Circuits and Systems II: Express Briefs.