What left to be done for PID control research? 2020 IFAC World Congress full day PID pre-conference workshop and beyond

PID 控制研究还有什么要做？
从 2020 IFAC 世界大会全天 PID 会前研讨会谈起

YangQuan Chen

Professor, School of Engineering, University of California, Merced(UCM)

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报告形式：**腾讯会议（ID：704 107 034）**

主 持 人：**高嵩 西安工业大学电子信息工程学院院长**

会议直播：**https://meeting.tencent.com/l/pBR4eFN0VLrN**

Abstract:

In this seminar, as a "hard-core control guy", I wish to make a correction to a popular saying that "There isn't anything left for PID control research" by first sharing with you my experience as one of the 10 speakers at the 2020 IFAC World Congress full day PID pre-conference workshop entitled "Advanced Topics in PID Control System Design, Automatic Tuning and Applications" then some of my personal perspectives on the future of PID research. With some detailed elaborations, I will suggest two broad directions I) fractional order PID controllers (where the orders of integrator and/or differentiator are non-integers); II) smarter PID control when embracing big data, machine learning, digital twin, edge computing, embedded tiny AI, towards a smarter control engineering (SCE) which is a new paradigm signified with 5 attributes 1) Taskable; 2) Cognitive; 3) Reflective; 4) Ethical; 5) Knowledge-rich.

Biography:

YangQuan Chen earned his Ph.D. from Nanyang Technological University, Singapore, in 1998. He had been a faculty of Electrical Engineering at Utah State University (USU) from 2000-12. He joined the School of Engineering, University of California, Merced (UCM) in summer 2012 teaching "Mechatronics", "Engineering Service Learning" and "Unmanned Aerial Systems" for undergraduates; "Fractional Order Mechanics", "Linear Multivariable Control", "Nonlinear Controls" and "Advanced Controls: Optimality and Robustness" for graduates. His research interests include mechatronics for sustainability, cognitive process control (smart control engineering enabled by digital twins), small multi-UAV based cooperative multi-spectral "personal remote sensing", applied fractional calculus in controls, modeling and complex signal processing; distributed measurement and control of distributed parameter systems with mobile actuator and sensor networks. He received Research of the Year awards from USU (2012) and UCM (2020). He was listed in Highly Cited Researchers by Clarivate Analytics in 2018 and 2019. His lab website is http://mechatronics.ucmerced.edu/