BJTU Seminar to be presented in Chinese

July 6th 2-3pm Beijing time

Title:

Why big data and machine learning must meet fractional calculus?

为什么大数据和机器学习必须和分数阶微积分相遇？

Abstract:

Fractional order calculus is about differentiation and integration of non-integer orders. Fractional calculus based fractional order thinking (FOT) has been shown to help us to better understand complex systems, better process complex signals, better control complex systems, better perform optimizations, and even better enable creativity. In this seminar I will briefly talk on basics of fractional calculus, fractional order thinking, and its rich stochastic models. Then I will justify the use of fractional calculus in big data analytics for quantifying its variability stemmed from the generating complex systems. I will justify why fractional calculus is needed in machine learning when we ask "what is the more optimal way to optimize?" in the last part. The take home message of this talk is "Big data and machine learning must meet fractional calculus".

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/