

Professor Manabu Kano



Bio:

Manabu Kano is a Professor in the Department of Informatics at Kyoto University. He previously served as a faculty member in the Department of Chemical Engineering, where he also earned his B.S., M.S., and Ph.D. degrees from Kyoto University. He has authored nearly 300 publications and is internationally recognized for his contributions to Process Systems Engineering, particularly in process control, process monitoring, soft sensors, and intelligent manufacturing systems for the process industries. He has also been active in the field of medical engineering.

Talk Title:

Learning Process Models When Data Are Scarce: Transferable Knowledge for Process Monitoring and Optimization

Abstract:

Industrial process data analytics is fundamentally constrained by data scarcity. Process data are strongly dependent on operating regimes, product grades, control policies, equipment, and scale. These characteristics make it difficult to build reliable models for new plants, new products, abnormal conditions, or future operating regimes. This talk discusses emerging approaches for learning process models under such data-scarce conditions. Relevant sources of transferable knowledge include mechanistic models,

laboratory experiments, previous products and plants, and pretrained time-series representations. I will discuss how such knowledge can be exploited through grey-box or hybrid modeling, physics-informed machine learning, transfer learning, and time-series foundation models. The focus will be on these methodologies and their applications to industrial process monitoring and optimization. Particular attention will be paid to source selection and negative transfer.