

数学与系统科学研究院
计算数学所网络学术报告

报告人: **Prof. Yoshinobu Kawahara**

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报告题目:

Data-driven modeling of complex dynamics: Koopman analysis, dynamic mode decomposition and machine learning

邀请人: 于海军 副研究员

报告时间: 2020 年 11 月 10 日 (周二)

上午 10:00-12:00

报告工具: 腾讯会议 (ID: 145 695 867)

会议链接:

<https://meeting.tencent.com/s/fdP5B2BqdYnd>

Abstract:

Data-driven modeling of complex systems has received much attention over the recent years, largely due to the availability of large datasets. In particular, the analysis of nonlinear dynamical system with Koopman operator has been actively discussed in applied mathematics and various scientific fields for this purpose. This is because it can provide physical interpretations of the dynamics based on deep theoretical backgrounds and is endowed with prominent estimation methods such as dynamic mode decomposition (DMD). DMD is a numerical method for estimating spectra of Koopman operator, and has been attracting attention as a way of obtaining global modal descriptions of nonlinear dynamics from data without requiring explicit prior knowledge. In this talk, I overview the recent advances on this research topic, focusing on spectral analysis of dynamical systems with Koopman operator and DMD. Then, I describe several recently-proposed related algorithms using machine learning principles. During the talk, I occasionally show some applications of these method to several real-world data.

Short bio.:

Yoshinobu Kawahara is a Professor at Institute of Mathematics for Industry (IMI), Kyushu University. He is also a Team Leader of Structured Learning Team at Center for Advanced Intelligence Project (AIP), RIKEN. He received the Bachelor's, Master's and Ph.D. degrees in engineering from The University of Tokyo in 2003, 2005 and 2008, respectively. He is awarded The Young Scientists' Prize, The Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology of Japan in 2020. His research interests include machine learning and its applications to scientific and engineering fields.

欢迎大家参加！