



北京大學
Peking University

报告地点: 新奥工学大楼2047

时间: 07月26日 10:00 - 11:30

COOL RESEARCH

系列报告第二十二讲

报告人: Bin Liu (斯特拉思克莱德大学副教授)

报告题目: Data-Driven Maintenance
Optimisation

Control, Optimization, Operations research, and Learning (COOL) Research Seminar是由北大工学院相关领域的几位老师发起, 旨在为国内外青年学者提供一个交流平台, 分享和探讨最新最有趣的研究成果, 促进领域内和跨领域沟通学习, 推动前沿理论的发展。





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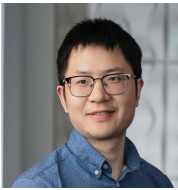
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Data-Driven Maintenance Optimisation

Abstract: This talk presents data-driven decision-making for smart operation and maintenance, focusing on failure prediction and maintenance optimisation. I will first discuss extending the applicability of deep learning (DL) algorithms for failure prediction with limited time series data. To broaden the application of DL algorithms in predicting failures using relatively limited datasets, we propose leveraging data augmentation methods. Different from existing approaches that indiscriminately blend synthetic and real data without considering the selection or weighting of synthetic samples, our novel method involves generating, selecting, and reweighting synthetic samples to enhance prediction accuracy. A case study of failure prediction in a wastewater treatment plant will be used to illustrate the effectiveness of the proposed method. Subsequently, I will present maintenance optimisation based on Markov decision processes, focusing on online learning and control of degradation process under dynamic working conditions.



Speaker: Bin Liu (Associate Professor at the University of Strathclyde)

Biography: Dr. Liu Bin is a Senior Lecturer (Associate Professor) in the Department of Management Science at the University of Strathclyde, UK. He obtained the B.E degree from Zhejiang University in automation and the PhD degree from City University of Hong Kong in industrial engineering. Dr. Liu's research interests encompass risk and reliability

analysis, intelligent maintenance management, and data-driven decision-making. He has published over fifty journal articles in disciplinary-leading journals such as European Journal of Operational Research, Automatica, IJSE Transactions, and IEEE Transactions journals.

主持人: 尤鹏程 (北京大学工学院助理教授)

