

The Hong Kong University of Science and Technology

Dept of Information Systems, Business Statistics and Operations Management

OM Seminar



Optimizer's Information Criterion: A Diagnostics Framework in Data-Driven Optimization

by

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Date : **21 November 2025 (Friday)**
Time : **10:30am – 11:45am**
Venue : **Meeting room 4047, LSK Business Building**

Abstract:

Data-driven optimization aims to integrate observed samples and machine learning predictions into downstream decision-making objectives. Different methods -- varying in model classes and algorithmic design -- can outperform one another across problem instances. This variability underscores a fundamental yet challenging question: how can we evaluate and compare the out-of-sample objective performance of data-driven optimization methods accurately and efficiently? In this talk, I will introduce Optimizer's Information Criterion (OIC), a general, decision-focused diagnostics framework that extends existing information criteria such as Akaike's Information Criterion from model selection to decision selection. OIC analytically approximates and removes the bias arising from the interaction between model fitting and downstream optimization. It covers a wide range of optimization formulations and provides reliable performance estimates without repeatedly re-solving optimization problems as in cross-validation. This perspective highlights how analyzing the structure of data-driven optimization algorithms offers a systematic and theoretically grounded approach to evaluating their performance.

Bio:

Tianyu Wang is a fifth-year PhD student in Operations Research at Columbia University, coadvised by Professors Garud Iyengar and Henry Lam. His research focuses on the statistical and computational foundations of data-driven decision-making, with applications in trustworthy AI, pharmaceutical manufacturing and emergency medical services. His work has received several recognitions, including paper awards from the Stochastic Programming Society and the INFORMS MSOM Society. He earned a B.E. in Information Systems and a B.S. in Mathematics from Tsinghua University in 2021, and gained industry experience as a research scientist intern at Amazon in the summer of 2023.

All interested are welcome!

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