The Hong Kong Polytechnic University
Department of Logistics and Maritime Studies
Research Seminar

Parametric Forecasting and Stochastic Programming Models for Call-Center Workforce Scheduling

by

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Time: 10:30am - 11:30am
Venue: N114, Block N
The Hong Kong Polytechnic University

(Conducted in English)

Abstract:

We develop and test an integrated forecasting and stochastic programming approach to workforce management in call centers. We first demonstrate that parametric forecasts, discretized using Gaussian quadrature, can be used to drive stochastic programs whose results are stable with relatively small numbers of scenarios. We then extend our approach to include forecast updates and two-stage stochastic programs with recourse and provide a general modeling framework for which recent, related models are special cases. In our formulations, the inclusion of multiple arrival-rate scenarios allows call centers to meet long-run average quality-of-service targets, and the use of recourse actions helps them to lower long-run average costs. Experiments with two large sets of call-center data highlight the complementary nature of these elements.

Bio:

Haipeng Shen received his PhD in Statistics from The Wharton School of Business, University of Pennsylvania in 2003. He is Fellow of the American Statistical Association and Elected Member of the International Statistical

Institute. Prior to joining HKU in 2015, he was a tenured full professor of Statistics and Operations Research, at the University of North Carolina at Chapel Hill. His research evolves around the theme of data-driven decision making in the face of uncertainty, including fundamental statistical research about challenges imposed by big data (high dimensionality and complex structure), as well as interdisciplinary analytical research in business analytics, neuroimaging, bioinformatics, and network traffic modeling. His work has been supported by US NSF Statistics, NSF Service Enterprise Systems, NIH, and The Xerox Foundation. He has published research articles in top journals in both Statistics (JASA and AOAS) and Operations Management (MSOM). He currently serves on the editorial board of JASA, AOAS, MS, and Technometrics. He has collaborated with industry partners such as Allcatel-Lucent, Bank of America, and Xerox.

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All are welcome!