

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

**Robust Capacity Planning for Project Management**

by

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**Date: 13 June 2019 (Thursday)**  
**Time: 11:00am - 12:00nn**  
**Venue: M714, Li Ka Shing Tower**  
**The Hong Kong Polytechnic University**

**(Conducted in English)**

**Abstract:**

We consider a significant problem that arises in the planning of many projects.

Project companies often use outsourced providers which require capacity reservation that must be contracted before task durations are realized. We model these decisions for a company which, given partially characterized distributional information, assumes the worst case distribution for task durations. Once task durations are realized, the project company makes decisions about fast tracking and outsourced crashing, to minimize the total capacity reservation, fast tracking, crashing, and makespan penalty costs. We model the company's objective using the target-based measure of minimizing an underperformance riskiness index. We allow for correlation in task performance, and for piecewise linear costs of crashing and makespan penalties. A computationally efficient optimal solution of the discrete, nonlinear model is possible for practical size projects. We compare the performance of our model against the best available benchmarks from the robust optimization literature, and show that it provides lower risk and greater robustness to distributional information. Our work thus enables more effective risk minimization in projects, and provides insights about how to make more robust capacity reservation decisions.

(Joint work with A.J. Conejo, D.Z. Long and R. Zhang)

**Bio:**

Nicholas G. Hall is Berry Professor in the Department of Management Sciences at the Fisher College of Business, and in the Department of Integrated Systems Engineering, at The Ohio State University. He holds a Ph.D. in Management Science from the University of California, Berkeley (1986), as well as B.A., M.A. degrees from the University of Cambridge, and a professional qualification in accounting. His research interests are in project management, incentives, scheduling, and pricing, and applications of operations research. He has published over 80 articles in the journals *Operations Research*, *Management Science*, *Mathematics of Operations Research*, *Mathematical Programming*, *Games and Economic Behavior*, *Interfaces*, and several other journals. His main teaching interest is in project management. A 2008 citation study ranked him 13th among 1,376 scholars in the operations management field. He won the Fisher College Pacesetters' Faculty Research Award in 1998 and 2005. He has served as President of Manufacturing and Service Operations Management society (1999-2000). He has served on the State of Ohio Steel Industry Advisory Council (1997–2002). In 2018, he served as the 24th President of INFORMS.

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**All are welcome!**