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Education **Massachusetts Institute of Technology**, Cambridge, MA
PhD in Operations Research; September 2018. GPA: 5.0
Thesis: Operations Management in a Large Online Retailer: Inventory, Scheduling and Picking
Advisors: Prof. Retsef Levi and Prof. Georgia Perakis

University of Cambridge, Cambridge, UK
BA in Mathematics, June 2012.

Work and Research Experience

- 2021–Present** **Institute of High Performance Computing**, Singapore
Senior Research Scientist. Manager: Dr. John Pang
Informing government agency policy on energy infrastructure by conducting research to optimize the placement of electric vehicle charging infrastructure and assess the impact of vehicle electrification on Singapore's transport and energy systems.
- 2021–Present** **Amazon**, Singapore
Senior Research Scientist. Manager: Dr. Tolga Cezik
Concurrently engaged in part-time research supporting fulfillment network planning and fulfillment centre operations with the Modeling and Optimization team. Influenced strategic plan on network topology.
- 2024** **Singapore University of Technology and Design**, Singapore
Adjunct Lecturer.
Co-taught 2 cohorts for Simulation Modelling and Analysis, adding the use of interactive Python notebooks as part of a broader effort to align programming languages used in courses across the university.
- 2018–2021** **Amazon**, Seattle, WA
Research Scientist. Manager: Dr. Tolga Cezik
Worked on optimization for fulfillment networks and fulfillment centre operations in the Modeling and Optimization team. Influenced strategic direction on a global initiative, wrote algorithm for a decision support tool used in production, and contributed to research that resulted in half a billion dollars in savings.
- 2013–2018** **Massachusetts Institute of Technology**, Cambridge, MA
Research Assistant. Advisors: Prof. Retsef Levi and Prof. Georgia Perakis
Collaborated with a large online retailer on a policy for picking multi-item orders in a warehouse, and worked on a batch scheduling problem with submodular cost functions, a complementary perspective to the same problem. Also worked on a robust version of the data driven newsvendor problem for mixture distributions.

- 2015** **Amazon, Seattle, WA**
Operations Research Scientist Intern. Manager: Dr. Felix Cheng
 Developed a model to attribute changes in inventory turnover rate based on historical data during a three-month internship.
- 2012–2013** **Institute for Infocomm Research, Singapore**
Research Engineer. Supervisor: Dr. Tony Q. S. Quek
 Wrote papers based on two projects, using stochastic geometry to model heterogeneous networks in cyber-physical systems, and using neural network techniques to deal with missing data in sensor networks.
- 2008** **Institute for Infocomm Research, Singapore**
Research Intern. Supervisor: Dr. Lekha Chaisorn
 Developed a robust algorithm for video signature generation and video matching during a three-month internship.

Publications

“Algorithm for robotic picking in Amazon fulfillment centers enables humans and robots to work together effectively”, with R. Allgor and T. Cezik, INFORMS Journal of Applied Analytics, 2023.

“Backhauling in heterogeneous cellular networks: Modeling and tradeoffs”, with T. Q. S. Quek and M. Kountouris, IEEE Transactions on Wireless Communications, 2015.

“Imputing missing values in sensor networks using sparse data representations”, with L. Z. Wong, H. Chen and S. Lin, 17th ACM International Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems, Montreal, Canada, Sep 2014.

“Wireless backhaul in small cell networks: Modelling and analysis”, with T. Q. S. Quek and M. Kountouris, in Proc. IEEE Vehicular Technology Conference Spring, Seoul, Korea, May 2014.

“Ordinal-based method for robust image/video signature generation”, with L. Chaisorn and S. Rahardja, in Proc. SPIE Optics and Photonics, 2008.

Works in progress

“A practical and precise model for shared charging dynamics of electric vehicles: insights for charger allocation”, with H. E. Tan, submitted to Production and Operations Management, 2024.

“Picking multi-item orders in a warehouse: data, models and simulation”, with T. Cezik, R. Levi and G. Perakis, R&R at Management Science.

“Incorporating parametric information in robust data-driven optimization”, in preparation for submission to Manufacturing & Service Operations Management.

“Submodular batch scheduling”, with T. Cezik, R. Levi and G. Perakis, in preparation for submission to Mathematics of Operations Research.

“Robust optimal inventory level when facing uncertainty in mixed demand”, with R. Levi and G. Perakis, working paper.

Teaching Experience

- 2024**
(Spring) **Singapore University of Technology and Design, Singapore**
*Adjunct Lecturer for **Simulation Modelling and Analysis** (40.015)*
Co-taught 2 cohorts, adding the use of interactive Python notebooks as part of a broader effort to align programming languages used in courses across the university.
- 2017**
Kaufman Teaching Certificate Program
Completed a series of eight practice-based workshops to learn evidence-based teaching techniques grounded in the scholarship of teaching and learning.
- 2017**
(Summer) **MIT Sloan School of Management, Executive MBA program, Cambridge, MA**
*Teaching Assistant for **Introduction to Operations Management** (15.734) – Rating: 5.97/7.0*
Core course on operations and revenue management. Taught recitations, held office hours and graded assignments.
- 2017**
(January) **MIT Sloan School of Management, Executive MBA program, Cambridge, MA**
*Teaching Assistant for **Risk Management** (15.731) – Rating: 6.57/7.0*
Elective course discussing frameworks and methodologies for risk management. Assisted in preparation of new course material and advised students on their projects.

Honors and Awards

- 2022** Firefly Borderless Award (Silver), Ministry of Trade and Industry, Singapore (team award)
- 2019** Amazon Research Scientist Summit 2019 Best Paper
- 2008–2018** National Science Scholarship, Agency for Science, Technology and Research, Singapore
- 2010** College Scholarship and College Prize, Pembroke College, University of Cambridge, UK
- 2008** Cambridge Commonwealth Trust Honorary Scholarship
- 2004/2005** Silver (2005) and Bronze (2004) Medals at the International Mathematical Olympiad

Skills and Activities

Languages: English, Mandarin
Programming: Python, Java, Julia, MATLAB, R, Gurobi, SQL

- Citizenship** Citizen of Singapore