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Academic Positions

Associate Professor Department of Industrial Systems Engineering & Management	National University of Singapore Jul. 2018–Present
Assistant Professor Department of Industrial Systems Engineering & Management	National University of Singapore Aug. 2011–Jun. 2018
Courtesy Appointment Department of Analytics & Operations	National University of Singapore Jul. 2017–Present
Visiting Associate Professor H. Milton Stewart School of Industrial & Systems Engineering	Georgia Institute of Technology Jan. 2019–Jun. 2019

Education

Ph.D. in Operations Research	Georgia Institute of Technology, 2011
Ph.D. in Electrical Engineering	Auburn University, 2007
M.S. in Electronic Engineering	Tsinghua University, 2003
B.E. in Electronic Engineering	Tsinghua University, 2000

Research Interests

Stochastic modeling, analysis, and control
Applications in service, healthcare, and transportation systems
Statistical signal processing and analysis

Journal Articles

1. S. He, “Diffusion approximation for efficiency-driven queues when customers are patient,” *Operations Research*, to appear.
2. S. He, M. Sim, and M. Zhang, “Data-driven patient scheduling in emergency departments: A hybrid robust–stochastic approach,” *Management Science*, to appear.
3. D. Zhang, Y. Liu, and S. He, “Vehicle assignment and relays for one-way electric car-sharing systems,” *Transportation Research Part B: Methodological*, vol. 120, pp. 125–146, Feb. 2019.
4. S. He, D. Yao, and H. Zhang, “Optimal ordering policy for inventory systems with quantity-dependent setup costs,” *Mathematics of Operations Research*, vol. 42, no. 4, pp. 979–1006, Nov. 2017.

5. J. G. Dai and S. He, "Many-server queues with customer abandonment: Numerical analysis of their diffusion model," *Stochastic Systems*, vol. 3, no. 1, pp. 96–146, Nov. 2013.
6. J. G. Dai and S. He, "Numerical analysis for diffusion models of $GI/Ph/n + GI$ queues," *ACM SIGMETRICS Performance Evaluation Review*, vol. 39, no. 4, p. 37, Apr. 2012.
7. J. G. Dai and S. He, "Many-server queues with customer abandonment: A survey of diffusion and fluid approximations," *Journal of Systems Science and Systems Engineering*, vol. 21, no. 1, pp. 1–36, Mar. 2012.
8. J. G. Dai, S. He, and T. Tezcan, "Many-server diffusion limits for $G/Ph/n + GI$ queues," *The Annals of Applied Probability*, vol. 20, no. 5, pp. 1854–1890, Oct. 2010.
9. J. G. Dai and S. He, "Customer abandonment in many-server queues," *Mathematics of Operations Research*, vol. 35, no. 2, pp. 347–362, May 2010.
10. J. K. Tugnait and S. He, "Multiuser/MIMO doubly selective fading channel estimation using superimposed training and Slepian sequences," *IEEE Transactions on Vehicular Technology*, vol. 59, no. 3, pp. 1341–1354, Mar. 2010.
11. J. K. Tugnait, S. He, and H. Kim, "Doubly-selective channel estimation using exponential basis models and subblock tracking," *IEEE Transactions on Signal Processing*, vol. 58, no. 3, pp. 1275–1289, Mar. 2010.
12. S. He and J. K. Tugnait, "On doubly selective channel estimation using superimposed training and discrete prolate spheroidal sequences," *IEEE Transactions on Signal Processing*, vol. 56, no. 7, pp. 3214–3228, Jul. 2008.
13. J. K. Tugnait and S. He, "Doubly-selective channel estimation using data-dependent superimposed training and exponential basis models," *IEEE Transactions on Wireless Communications*, vol. 6, no. 11, pp. 3877–3883, Nov. 2007.
14. X. Meng, J. K. Tugnait, and S. He, "Iterative joint channel estimation and data detection using superimposed training: Algorithms and performance analysis," *IEEE Transactions on Vehicular Technology*, vol. 56, no. 4, pp. 1873–1880, Jul. 2007.
15. S. He, J. K. Tugnait, and X. Meng, "On superimposed training for MIMO channel estimation and symbol detection," *IEEE Transactions on Signal Processing*, vol. 55, no. 6, pp. 3007–3021, Jun. 2007.
16. S. He, P. Johnson, Z. Li, and W. Tang, "An example in elementary probability," *Alabama Journal of Mathematics*, vol. 31, pp. 23–25, Spring 2007.
17. J. K. Tugnait, X. Meng, and S. He, "Doubly-selective channel estimation using superimposed training and exponential bases models," *EURASIP Journal on Applied Signal Processing*, vol. 2006, Article ID 85303, 11 pages, 2006.
18. S. He, "Adaptive equalization for multipath fading channels using Laguerre filters," *Telecommunication Engineering (in Chinese)*, vol. 44, no. 1, pp. 82–86, Jan. 2004.

Book Chapters

1. J. G. Dai and S. He, "Queues in service systems: Customer abandonment and diffusion approximations," in *TutORials in Operations Research* (J. Geunes, Ed.), Hanover, MD: INFORMS, 2011.

Working Papers

1. P. Cao, S. He, J. Huang, and Y. Liu “To pool or not to pool: Queueing design for large-scale service systems,” submitted to *Operations Research*, under major revision.
2. S. Han, S. He, and H. C. Oh, “Data-driven inpatient bed assignment: A P -model approach to boarding and overflowing,” submitted to *Manufacturing & Service Operations Management*, under major revision.

Conference Proceedings

1. J. G. Dai and S. He, “Estimating customer patience-time density in large-scale call centers,” in *Proc. 7th International Conference on Service Systems and Service Management (ICSSSM)*, Tokyo, Japan, Jun. 28–30, 2010.
2. S. He and J. K. Tugnait, “Decision-directed tracking of doubly-selective channels using exponential basis models,” in *Proc. 2008 IEEE International Conference on Communications (ICC)*, Beijing, China, May 19–23, 2008, pp. 5098–5102.
3. J. K. Tugnait and S. He, “Recursive least-squares doubly-selective channel estimation using exponential basis models and subblock-wise tracking,” in *Proc. 33rd IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Las Vegas, NV, Mar. 30–Apr. 4, 2008, pp. 2861–2864.
4. S. He and J. K. Tugnait, “Doubly-selective channel estimation using exponential basis models and subblock tracking,” in *Proc. 50th IEEE Global Telecommunications Conference (GLOBECOM)*, Washington, DC, Nov. 26–30, 2007, pp. 2847–2851.
5. S. He and J. K. Tugnait, “Self-interference suppression in doubly-selective channel estimation using superimposed training,” in *Proc. 2007 IEEE International Conference on Communications (ICC)*, Glasgow, UK, Jun. 24–28, 2007, pp. 3028–3033.
6. S. He and J. K. Tugnait, “Doubly-selective multiuser channel estimation using superimposed training and discrete prolate spheroidal basis expansion models,” in *Proc. 32nd IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Honolulu, HI, Apr. 15–20, 2007, pp. ii-861–ii-864.
7. S. He and J. K. Tugnait, “Doubly-selective channel estimation using superimposed training and discrete prolate spheroidal basis models,” in *Proc. 49th IEEE Global Telecommunications Conference (GLOBECOM)*, San Francisco, CA, Nov. 27–Dec. 1, 2006.
8. S. He and J. K. Tugnait, “Direct equalization of multiuser doubly selective channels based on superimposed training,” in *Proc. 14th European Signal Processing Conference (EUSIPCO)*, Florence, Italy, Sep. 4–8, 2006.
9. J. K. Tugnait and S. He, “Direct FIR linear equalization of doubly selective channels based on superimposed training,” in *Proc. 31st IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Toulouse, France, May 14–19, 2006, pp. iv-589–iv-592.
10. S. He and J. K. Tugnait, “On bias-variance trade-off in superimposed training-based doubly selective channel estimation,” in *Proc. 40th Conference on Information Sciences and Systems (CISS)*, Princeton Univ., NJ, Mar. 22–24, 2006, pp. 1308–1313.
11. J. K. Tugnait and S. He, “Doubly-selective channel estimation using data-dependent superimposed training and exponential bases models,” in *Proc. 40th Conference on Information Sciences and Systems (CISS)*, Princeton Univ., NJ, Mar. 22–24, 2006, pp. 375–380.

12. J. K. Tugnait, S. He, and X. Meng, "On superimposed-training power allocation for time-varying channel estimation," in *Proc. 13th IEEE Workshop on Statistical Signal Processing (SSP)*, Bordeaux, France, Jun. 17–20, 2005, pp. 1330–1335.
13. J. K. Tugnait and S. He, "Performance analysis of an MIMO channel estimator based on superimposed training and first-order statistics," in *Proc. 13th IEEE Workshop on Statistical Signal Processing (SSP)*, Bordeaux, France, Jun. 17–20, 2005, pp. 1336–1341.
14. S. He, X. Shan, and Y. Ren, "A new adaptive equalization scheme for MIMO channels," in *Proc. 3rd International Symposium on Image and Signal Processing and Analysis*, Rome, Italy, Sep. 18–20, 2003, pp. 1028–1033.
15. S. He and X. Shan, "Adaptive equalization for multipath fading channels using Laguerre filters," in *Proc. 2003 IEEE Pacific Rim Conference on Communications, Computers, and Signal Processing (PACRIM)*, Victoria, Canada, Aug. 28–30, 2003, pp. 450–453.
16. S. He, X. Shan, Y. Ren, and S. Cao, "Adaptive Laguerre equalization for MIMO fading channels," in *Proc. 2003 IASTED International Conference on Circuits, Signals, and Systems*, Cancun, Mexico, May 19–21, 2003, pp. 17–22.

Teaching Experience

Instructor 2011–Present
 Department of Industrial & Systems Engineering National University of Singapore

- ◇ IE 2100/2100E: *Probability Models with Applications*, Spring 2014, 2015
- ◇ IE 2120E: *Probability and Statistics*, Fall 2011–2015
- ◇ IE 5002: *Applied Engineering Statistics*, Spring 2012
- ◇ IE 5004: *Engineering Probability and Simulation*, Fall 2013–2019
- ◇ IE 6004: *Stochastic Processes I*, Fall 2012, 2015, 2016, 2019
- ◇ IE 6099: *ISE Research Methodology*, Spring 2012–2014, 2018

Instructor 2010, 2019
 School of Industrial & Systems Engineering Georgia Institute of Technology

- ◇ ISyE 3232: *Stochastic Manufacturing and Service Systems*, Summer 2010
- ◇ *Weak Convergence in Stochastic Systems*, Spring 2019

Ph.D. Students

Lan Ding Aug. 2012–Dec. 2016
 Thesis: *Diffusion Approximation for Efficiency-Driven Queues Under Refined Patience Time Scaling*
 First position after PhD: Research Fellow, Department of Industrial Systems Engineering & Management, National University of Singapore

Bo Jia Aug. 2012–Dec. 2016
 Thesis: *Optimal Ordering Policies for Brownian Inventory Models with General Setup costs*
 First position after PhD: Assistant Vice President, Citi Group

Yang Yunfang Aug. 2018–Present

Postdoctoral Mentoring

- Dacheng Yao Nov. 2012–Apr. 2014
Current position: Associate Professor, Academy of Mathematics and Systems Science, Chinese Academy of Sciences
- Han Ye (co-mentored with Melvyn Sim) Aug. 2013–Jul. 2014
Current position: Assistant Professor, College of Business, University of Illinois at Urbana–Champaign
- Jin Qi (co-mentored with Melvyn Sim) Aug. 2013–Jul. 2014
Current position: Assistant Professor, Department of Industrial Engineering and Logistics Management, Hong Kong University of Science and Technology
- Bo Wei Feb. 2015–Mar. 2017
Current position: Research Fellow, Department of Industrial Systems Engineering and Management, National University of Singapore
- Lan Ding Nov. 2017–Feb. 2019
Current position: Data Scientist, OMNETRIC

Research Grants

1. PI, “Data-based control of queueing networks: A robust–stochastic framework,” S\$625,232, Academic Research Fund Tier 2, Ministry of Education, Nov. 2017–Oct. 2020.
2. PI, “Optimal control of surgery waiting lists,” S\$160,000, Academic Research Fund Tier 1, Ministry of Education, Mar. 2015–Feb. 2018.
3. PI, “Modeling, analysis, and control of patient flow in hospitals: A data-driven approach,” S\$300,000, Global Asia Institute Grant, National University of Singapore, Apr. 2013–Mar. 2016.
4. PI, “Analysis of service systems with many servers,” S\$179,900, Academic Research Fund Tier 1, Ministry of Education, Nov. 2011–Oct. 2014.
5. Co-PI, “Service Productivity and Innovation Research (SPIRE),” S\$4,119,439, Social Science Research Thematic Grant, Ministry of Education, Jun. 2017–May 2022.
6. Co-PI, “Integrated car sharing design and operations with existing transportation network,” S\$170,999, Academic Research Fund, Ministry of Education, Mar. 2016–Feb. 2019.
7. Co-PI, “Risk mitigation through supply chain cooperation,” S\$454,500, Science & Engineering Research Council Grant, Agency for Science, Technology and Research, Dec. 2012–Nov. 2014.

Awards and Honors

- Third Place, INFORMS Junior Faculty Interest Group Paper Competition, 2015.
- Team Member, Next Generation Container Port Challenge Grand Prize Winner, 2013.
- Teaching Commendation List, Faculty of Engineering, National University of Singapore, 2012/2013, 2016/2017.
- Finalist, Georgia Tech Teaching Assistant Award, 2011
- Vodafone–US Foundation Fellowship, 2005–2007

Plenary Talks

1. Data-Driven Inpatient Bed Assignment: Balancing Boarding and Overflowing
 - Symposium on Artificial Intelligence in Medicine
Singapore, Apr. 4, 2018
2. Data-Driven Patient Scheduling in Emergency Departments
 - The 2nd NUS–USTC Business Analytics Workshop
Hefei, China, Apr. 9, 2017
 - Mostly OM Workshop
Beijing, China, May 27, 2016

Invited Seminars

1. Diffusion Approximation for Efficiency-Driven Queues When Customers are Patient
 - College of Business, City University of Hong Kong
Hong Kong, China, Apr. 7, 2017
2. A Diffusion Model for Efficiency-Driven Queues
 - Nanyang Business School
Singapore, Apr. 10, 2015
3. A One-Dimensional Diffusion Model for Overloaded Queues with Customer Abandonment
 - Business School, National University of Singapore
Singapore, Oct. 23, 2013
 - School of Management, University of Science and Technology of China
Hefei, China, Jun. 24, 2013
 - School of Operations Research and Information Engineering, Cornell University
Ithaca, NY, Apr. 9, 2013
 - IBM Thomas J. Watson Research Center
Yorktown Heights, NY, Apr. 3, 2013
4. Many-Server Queues in the QED Regime
 - Department of Logistics and Maritime Studies, Hong Kong Polytechnic University
Hong Kong, China, Dec. 18, 2012
5. Many-Server Queues with Customer Abandonment
 - Department of Industrial and Systems Engineering, National University of Singapore
Singapore, Feb. 8, 2011
 - Department of Industrial Engineering and Management Sciences, Northwestern University
Evanston, IL, Feb. 1, 2011

Invited Conference Presentations

1. “On Brownian approximation for superposition of renewal processes,” INFORMS Annual Meeting, Phoenix, AZ, Nov. 4, 2018.
2. “Data-based control of queues: A P -model approach,” INFORMS Applied Probability Society Conference, Evanston, IL, Jul. 12, 2017.
3. “Complete resource pooling in open shop networks,” INFORMS Annual Meeting, Nashville, TN, Nov. 13, 2016.
4. “Data-driven patient scheduling in emergency departments: A hybrid robust–stochastic approach,” INFORMS Annual Meeting, Philadelphia, PA, Nov. 4, 2015.
5. “Diffusion approximation for efficiency-driven queues: A space–time scaling approach,” INFORMS Annual Meeting, Philadelphia, PA, Nov. 1, 2015.
6. “Optimal scheduling for symmetric open shop networks,” INFORMS Applied Probability Society Conference, Istanbul, Turkey, Jul. 7, 2015.
7. “Diffusion approximation for efficiency-driven queues: A space–time scaling approach,” IMA Special Workshop on Reflected Brownian Motions, Stochastic Networks, and Their Applications, Minneapolis, MN, Jun. 25, 2015.
8. “A one-dimensional diffusion model for overloaded queues with customer abandonment,” INFORMS Applied Probability Society Conference, San Jose, Costa Rica, Jul. 15, 2013.
9. “Numerical analysis for diffusion approximations of many-server queues,” A*STAR–Fujitsu Joint Workshop on Computational Social Science and Engineering for Urban Sustainability, Singapore, Apr. 26, 2013.
10. “Numerical analysis for diffusion models of many-server queues,” INFORMS Annual Meeting, Charlotte, NC, Nov. 13, 2011.
11. “Numerical analysis for diffusion models of $GI/Ph/n + GI$ queues,” The 7th International Conference on Matrix-Analytic Methods in Stochastic Models (MAM7), New York, NY, Jun. 14, 2011.
12. “Computing stationary distributions for diffusion limits of $G/Ph/n + GI$ queues,” INFORMS Annual Meeting, Austin, TX, Nov. 7, 2010.
13. “Customer abandonment in many-server queues,” INFORMS Annual Meeting, San Diego, CA, Oct. 12, 2009.
14. “Decision-directed tracking of doubly-selective channels using exponential basis models,” IEEE International Conference on Communications (ICC 2008), Beijing, China, May 22, 2008.
15. “Direct FIR linear equalization of doubly selective channels based on superimposed training,” Vodafone Fellows Initiative 2007 Symposium, Auburn University, AL, Mar. 30, 2007.
16. “Doubly-selective channel estimation using superimposed training,” Vodafone Fellows Initiative 2006 Symposium, University of California at Berkeley, CA, Apr. 8, 2006.
17. “On bias-variance trade-off in superimposed training-based doubly selective channel estimation,” The 40th Conference on Information Sciences and Systems (CISS 2006), Princeton University, NJ, Mar. 24, 2006.
18. “Doubly-selective channel estimation using data-dependent superimposed training and exponential bases models,” The 40th Conference on Information Sciences and Systems (CISS 2006), Princeton University, NJ, Mar. 22, 2006.

Campus Services

Deputy Head (Research), ISEM Department	Oct. 2018–Present
Assistant Head (Research), ISEM Department	Jan. 2018–Oct. 2018
Member of Faculty Search Committee, ISEM Department	2014–2015, 2017–Present
Member of M.Sc. Curriculum Revision Task Force, ISEM Department	2013–2014
Member of Ph.D. Program Committee, Institute of Operations Research and Analytics	2017–Present
Member of GEP Admission/Scholarship Interview Committee, Faculty of Engineering	2015–2016
Member of Ph.D. Interview Committee, Faculty of Engineering	2014

Professional Activities

Journal referee

- *The Annals of Applied Probability*
- *Operations Research*
- *Mathematics of Operations Research*
- *Management Science*
- *Stochastic Systems*
- *Queueing Systems*
- *Advances in Applied Probability*
- *INFORMS Journal on Optimization*
- *Production and Operations Management*
- *Performance Evaluation*
- *Stochastic Models*
- *IIEE (IIE) Transactions*
- *Mathematical Methods of Operations Research*
- *Annals of Operations Research*
- *Naval Research Logistics*
- *Transportation Research Part B: Methodological*
- *Transportation Research Part E: Logistics and Transportation Review*
- *IEEE Journal on Selected Areas in Communications*
- *IEEE Transactions on Automatic Control*
- *IEEE Transactions on Communications*
- *IEEE Transactions on Multimedia*
- *IEEE Transactions on Signal Processing*
- *IEEE Transactions on Vehicular Technology*
- *IEEE Transactions on Wireless Communications*
- *IEEE Communications Letters*
- *IEEE Signal Processing Letters*

- *Signal Processing*

Competition judge

- INFORMS Manufacturing & Service Operations Management Society (MSOM) Student Paper Competition, 2016

Grant proposal reviewer

- Academic Research Fund, Ministry of Education Singapore
- General Research Fund, Research Grants Council of Hong Kong
- Early Career Fund, Research Grants Council of Hong Kong
- National Security Agency Mathematical Sciences Program, American Mathematical Society

Workshop organizer

- Symposium on Artificial Intelligence in Medicine: Towards Smart Health, 2018

Member of technical program committees

- IEEE Global Communications Conference (GLOBECOM), 2011–2015
- International Conference on Testbeds and Research Infrastructures for the Development of Networks and Communities (TRIDENTCOM), 2009
- International Conference on Communications and Networking in China (CHINACOM), 2008

Conference session organizer

- “Optimal control in queueing networks,” INFORMS Annual Meeting, 2014
- “Diffusion models for queues,” INFORMS Annual Meeting, 2014
- “Stochastic modeling and analysis in healthcare systems,” POMS International Meeting, 2014
- “Analysis and control of queues,” INFORMS International Meeting, 2012
- “Supply chain management II,” IIE Asian Conference, 2012

Organizer of Stochastic Systems Seminars, Georgia Tech, 2009–2011

Member of IEEE, IMS, and INFORMS