

## Miao Bai

Department of Operations and Information Management, University of Connecticut, Storrs, CT

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### CONTACT

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### EXPERIENCE

Assistant Professor, Department of Operations and Information Management, University of Connecticut, Storrs, CT, August 2019-Present.

Research Collaborator, Mayo Clinic, Rochester, MN, December 2019-Present.

Postdoctoral Research Associate, Mayo Clinic, Rochester, MN, July 2017-July 2019.

Operations Research Intern, Sabre Airline Solutions, Southlake, Texas, May-August 2016

### EDUCATION

Ph.D. in Industrial and Systems Engineering, Lehigh University, Bethlehem, PA, May 2017

- Advisors: Robert H. Storer and Gregory L. Tonkay.
- Dissertation: Optimization of Surgery Scheduling in Multiple ORs with PACU Capacity Constraints

B.Eng. in Industrial and Systems Engineering, Hong Kong Polytechnic University, Hong Kong, May 2011

- Graduated with first class honors.

### RESEARCH INTERESTS

Leverage mathematical optimization, data analytics and machine learning to develop effective and efficient analytical and algorithmic solutions for complex problems arising in healthcare systems and medicine.

### PUBLICATIONS

(\* student co-authors)

#### **Published**

[1] Miao Bai, Bjorn Berg, Esra Sisikoglu Sir, Mustafa Y. Sir, "Partially-partitioned Templating Strategies for Outpatient Specialty Practices", forthcoming at *Production and Operations Management*

- **Finalist**, POMS College of Healthcare Operations Management (CHOM) Best Paper Award Competition, 2021.

- [2] Miao Bai, Robert H. Storer, Gregory L. Tonkay, “Surgery Sequencing Coordination with Recovery Resource Constraints”, *INFORMS Journal on Computing*, 2022 34:2, 1207-1223.
- [3] Miao Bai, Kimberly R. Gergelis, Mustafa Y. Sir, Thomas J. Whitaker, David M. Routman, Bradley J. Stish, Brian J. Davis, Thomas M. Pisansky, Richard Choo, “Comparing bowel and urinary domains of patient-reported quality of life at the end of and 3 months post radiotherapy between intensity-modulated radiotherapy and proton beam therapy for clinically localized prostate cancer”, *Cancer Medicine*, 2020, PMID: 32931662.
- [4] Kimberly R. Gergelis, Miao Bai, Thomas J. Whitaker, David M. Routman, Mustafa Y. Sir, Richard Choo, “Acute Patient-reported Toxicities after Proton Therapy or Intensity-modulated Radiotherapy for Prostate Cancer”, *Journal of Clinical Oncology* 2020 38:6\_suppl, 305-305 (Published abstract).
- [5] Miao Bai, Mustafa Y. Sir, Kalyan S. Pasupathy, “Pattern-based Surgical Capacity Planning”, *Journal of Biomedical Informatics*, Vol 94, 2019.
- [6] Miao Bai, Robert H. Storer, Gregory L. Tonkay, “A Sample Gradient-based Algorithm for Multiple-OR and PACU Surgery Scheduling”, *IISE Transactions*, Vol. 49, Issue 4, pp 367-380, 2017.  
 - **Winner**, Van Hoesen Family Best Publication Award, ISE department, Lehigh University, 2016.
- [7] H.C. Man, Miao Bai, F.T. Cheng, “Laser Diffusion Nitriding of Ti-6Al-4V for Improving Hardness and Wear Resistance”, *Applied Surface Science*, Vol 258, pp 436-441, 2011. (Senior-year project paper).

### Submitted Journal Articles

- [1] Ayush Sengupta\*, Shu He, Miao Bai, Xinxin Li, “Ride-to-Health: The Impact of Ridesharing on Patients’ Emergency Care Access”.  
 - Reject and Resubmit at *Information Systems Research*
- [2] Miao Bai, Nan Liu, Zheng Zhang, “Helping the Captive Audience: Advance Notice of Diagnostic Service for Hospital Inpatients”.
- [3] Miao Bai, Ying Cui, Guangwen Kong, Zhenhuan Zhang\*, “No Panic in Pandemic: The Impact of Individual Choice on Public Health Policy and Vaccine Priority”.  
 - **1st place**, Post-Pandemic Supply Chain and Healthcare Management Conference Best Paper Competition, 2021.  
 - **2nd place**, POMS College of Humanitarian Operations & Crisis Management (HOCM) Best Paper Award Competition, 2021.  
 - **Winner**, Best Problem-Driven Analytical Research Paper Award, Decision Sciences Institute (DSI) Annual Conference, 2021.  
 - Covered by article “Social distancing should stick around” at *The Hill*.  
 - Covered by article “No panic in pandemic” at *the Fox School of Business*.
- [4] Dongmin Li\*, Miao Bai, Xiaochen Xian, “Data-driven Pathwise Sampling Approaches for Online Anomaly Detection”.

- **Finalist**, INFORMS Quality, Statistics, and Reliability (QSR) Best Paper Competition, 2021.
- Covered by article “Research Spotlight: Improving Data Sampling Methods” at *the Warren B. Nelms Institute for the Connected World*.

### **Work In Progress**

- [1] Miao Bai, George Qi Chen, Cuihong Li, “First Dose or Second Dose? A Study of Vaccination Policy with Supply and Capacity Constraints”.
- [2] Miao Bai, Carlos Cardonha, “Cardinality Constrained Knapsack Problem with Concave Piecewise-Linear Utilities”.
- [3] Ayush Sengupta\*, Shu He, Miao Bai, Xinxin Li, “The Societal Impact of Gig Economy: Opportunities and Equality”.

### **MEDIA COVERAGE**

- [1] Research Spotlight: Improving Data Sampling Methods, Warren B. Nelms Institute for the Connected World, March 7, 2022
- [2] No panic in pandemic, Fox School of Business, February 8, 2022
- [3] Social distancing should stick around, The Hill, June 7, 2021
- [4] A New Mathematical Model Streamlines Hospital OR Scheduling, Lehigh News, December 29, 2017
- [5] A New Mathematical Model Streamlines Hospital OR Scheduling, Lehigh Research Review, Vol 3, 2018

### **HONORS & AWARDS**

- Winner, Best Problem-Driven Analytical Research Paper Award, Decision Sciences Institute (DSI) Annual Conference, 2021
- Finalist, INFORMS Quality, Statistics, and Reliability (QSR) Best Paper Competition, 2021
- 1st place, Post-Pandemic Supply Chain and Healthcare Management Conference Best Paper Competition, 2021
- 2nd place, POMS College of Humanitarian Operations & Crisis Management (HOCM) Best Paper Award Competition, 2021
- Finalist, POMS College of Healthcare Operations Management (CHOM) Best Paper Award Competition, 2021
- POMS Emerging Scholars Meeting, 2021
- INFORMS New Faculty Colloquium, Seattle, WA, October 2019
- Nominee for Elizabeth V. Stout Dissertation Award, 2017

- Departmental nomination for the College-wide dissertation award at Lehigh University.
- Winner, Van Hoesen Family Best Publication Award, ISE department, Lehigh University, 2016
- Winner, Teaching Assistant of the Year, Lehigh University, 2016
  - University-wide graduate teaching award.
  - Honorable mention, 2013 and 2015.
- Honorable mention, Graduate Life Leadership Award, Lehigh University, 2016
- IIE Doctoral Colloquium, Anaheim, CA, May 2016
- INFORMS Doctoral Colloquium, Philadelphia, PA, November 2015
- Merit-based College Scholarship, The Hong Kong Polytechnic University, 2007-2011
  - 4-year scholarship with a full coverage of tuition and living allowance.
- Dean's honors list of the Faculty of Engineering, The Hong Kong Polytechnic University, 2007-2011
- Industrial and Systems Engineering Scholarship, The Hong Kong Polytechnic University, 2010
- 1st runner-up in Hong Kong Society for Quality Student Project Competition, 2010
- Certificate of Appreciation in HSBC Young Entrepreneur Awards, 2010

## **TEACHING EXPERIENCE**

### **Courses Taught at the University of Connecticut**

OPIM3104 Operations Management, 2019-2021

- Spring 2022, rating 4.90/5; enrollment 52; response rate 81%
- Fall 2021, rating 4.50/5; enrollment 129; response rate 78%
- Spring 2021, rating 4.90/5; enrollment 41; response rate 83%; virtual due to COVID-19
- Fall 2020, rating 4.83/5; enrollment 135; response rate 73%; virtual due to COVID-19
- Spring 2020, rating: 4.60/5; enrollment 40, response rate 35%; second half virtual due to COVID-19
- Fall 2019, 4.86/5; enrollment 139, response rate 60%

### **Courses Taught at Lehigh University**

ISE215 Fundamentals of Modern Manufacturing, Summer 2012-2013

- Evaluation: 4.71/5 (2013); 5/5 (2012).

ISE216 Manufacturing Laboratory, Fall 2011-2016

- Evaluation: 4.94/5 (2016), 4.81/5 (2015); 4.66/5 (2014); 4.75/5 (2013); 4.16/5 (2012); 3.65/5 (2011).

ISE132 Work Systems Laboratory, Spring 2012-2017

- Evaluation: 4.76/5 (2017), 4.72/5 (2016); 4.58/5 (2015); 4.59/5 (2014); 4.56/5 (2013); 4.73/5 (2012).

## MENTORSHIP

- Graduate
  - Ayush Sengupta, Associate advisor, University of Connecticut, 2021-Present
  - Saharnaz Mehrani, Associate advisor, University of Connecticut, 2020-2021
  - Amelia Conway, Master thesis co-advisor, Lehigh University, 2020-2021
- Undergraduate
  - Behic Guven, undergraduate intern, Mayo Clinic, 2018

## PRESENTATIONS

- [1] M. Bai, N. Liu, Z. Zhang, Helping the Captive Audience: Advance Notice of Diagnostic Service for Hospital Inpatients
  - INFORMS Annual Conference, Indianapolis, IN, October 2022.
  - Presented by Z. Zhang, International Conference of CSAMSE (Online), July 2022.
  - POMS Annual Conference (Online), April 2022.
- [2] A. Sengupta\*, S. He, M. Bai, X. Li, Ride-to-Health: The Impact of Ridesharing on Patients' Emergency Care Access
  - Presented by A. Sengupta, INFORMS Annual Conference, Indianapolis, IN, October 2022.
  - Video presentation by A. Sengupta, Platform Strategy Research Symposium, Boston, MA, July 2022.
  - Presented by A. Sengupta, Conference on Health IT and Analytics (CHITA), Washington, DC, March 2022.
  - Presented by A. Sengupta, Conference on Information Systems and Technology (CIST), Newport Beach, CA, October 2021.
  - Presented by A. Sengupta, INFORMS Annual Meeting, Anaheim, CA (Hybrid), Oct 2021.
- [3] M. Bai, Y. Cui, G. Kong, Z. Zhang\*, No Panic in Pandemic: The Impact of Individual Choice on Public Health Policy and Vaccine Priority
  - Presented by G. Kong, INFORMS Annual Conference, Indianapolis, IN, October 2022.
  - Presented by G. Kong, POMS Annual Conference (Online), April 2022.
  - DSI 52nd Annual Conference (Online), November 2021.
  - Presented by G. Kong, INFORMS Annual Conference (Hybrid), Anaheim, CA, October 2021.
  - International Conference of CSAMSE (Online), July 2021.
  - INFORMS Healthcare Conference (Online), July 2021.
  - Presented by G. Kong, Post-Pandemic Supply Chain and Healthcare Management Conference (Online), June 2021.
  - Invited talk (Online) at School of Management, Zhejiang University, China, June 2021

- M&SOM Conference (Online), June 2021
  - POMS Annual Conference (Online), May 2021.
- [4] D. Li\*, M. Bai, X. Xian, Data-driven Pathwise Sampling Approaches for Online Anomaly Detection
- (scheduled) INFORMS Annual Conference, Indianapolis, IN, October 2022.
  - Presented by D. Li, INFORMS Annual Conference (Hybrid), Anaheim, CA, October 2021.
  - M&SOM Conference (Online), June 2021.
  - POMS Annual Conference (Online), May 2021
  - Previously circulated as “Online Monitoring with Mobile Sensors: Data-driven Pathwise Sampling Strategies” and “Data-driven Pathwise Sampling Approaches for Online Anomaly Detection”
- [5] M. Bai, B. Berg, E. Sisikoglu Sir, M.Y. Sir, Priority-based templating for outpatient specialty practices
- INFORMS Annual Conference (Hybrid), Anaheim, CA, October 2021.
  - POMS Annual Conference (Online), May 2021.
  - INFORMS Annual Conference (Online), November 2020.
  - INFORMS Annual Conference, Seattle, WA, October 2019.
  - INFORMS Healthcare Conference, Cambridge, MA, July 2019.
- [6] K. Gergelis, M. Bai, M. Sir, T. Whitaker, D. Routman, B. Stish, B. Davis, T. Pisansky, R. Choo, Acute Patient-reported Toxicities after Proton Therapy or Intensity-modulated Radiotherapy for Prostate Cancer,
- Presented by K. Gergelis, American Society of Clinical Oncology (ASCO) Genitourinary Cancers Symposium, San Francisco, CA, February 2020
- [7] M. Bai, Lessons Learned from My Work at Mayo Clinic
- Healthcare Systems Engineering Seminar, Lehigh University, Bethlehem, PA, February 2020.
- [8] M. Bai, M.Y. Sir, K.S. Pasupathy, Dynamic Coordination of Exams in the Radiology Practice
- INFORMS Annual Conference, Phoenix, AZ, November 2018.
- [9] P. Kostandy, M. Bai, K. Maass, S. Romero Brufau, S. R. Schultz, M. Sir, K. Pasupathy, B. Bartholmai, Data-Driven Capacity Assessment of Nursing Bay Resources Shared Among Multiple Radiology Modalities
- Presented by P. Kostandy, Radiological Society of North America (RSNA) Annual Conference, Chicago, IL, November 2018.
- [10] M. Bai, Surgery Scheduling under Uncertainties and Disruptions: an Industrial Engineering Approach
- Surgery Grand Round at St. Luke’s University Hospital, Bethlehem, PA, April 2017.
- [11] M. Bai, R.H. Storer, G.L. Tonkay, T.E. Theman, Proactive-Reactive Surgery Scheduling with Disruptions

- Healthcare Systems Engineering Seminar, Lehigh University, Bethlehem, PA, February 2017.
  - Department of Information Systems, Statistics, and Management Science, University of Alabama, Tuscaloosa, AL, January 2017.
- [12] M. Bai, J. Wang, X. Luo, Accurate Modeling of Flight Connections: Connection-based Minimum Ground Time
- Operations Research Seminar, Sabre Airline Solutions, Southlake, TX, August 2016.
- [13] M. Bai, R.H. Storer, G.L. Tonkay, T.E. Theman, Reactive Surgery Rescheduling on the Day of Surgery
- INFORMS Annual Conference, Nashville, TN, November 2016.
  - MOPTA, Bethlehem, PA, August 2016.
  - IIE Annual Conference, Anaheim, CA, May 2016.
- [14] M. Bai, R.H. Storer, G.L. Tonkay, Surgery Sequencing and Scheduling in Multiple ORs with PACU Constraints
- Information and Decision Engineering Seminar at Kern Center for the Science of Health Care Delivery, Mayo Clinic, Rochester, MN, November 2017.
  - IIE Annual Conference, Anaheim, CA, May 2016.
  - INFORMS Annual Conference, Philadelphia, PA, November 2015.
- [15] M. Bai, R.H. Storer, G.L. Tonkay, A Sample Gradient-Based Algorithm for Multiple-OR and PACU Surgery Scheduling
- INFORMS Annual Conference, Philadelphia, PA, November 2015.
  - MOPTA, Bethlehem, PA, July 2015.

## **PROFESSIONAL SERVICES**

- School and Departmental Services at UConn
  - Member, Management & Engineering for Manufacturing (MEM) Program Committee, 2020-Present
  - Member, Departmental Ph.D. Qualifying Paper Committee, 2021-Present
  - Member, Departmental Ph.D. Committee, 2020-2021
  - Member, School Committee for Beta Gamma Sigma, 2019-2022
  - Member, Departmental MIS Scholarship Committee, 2019-2020
  - Member, Departmental Faculty Search for Professor-in-Residence, Spring 2020
- Voluntary Services at UConn
  - Member, Departmental Online Teaching Guidance Committee, May 2020
  - Member, OPIM 3104 Review and Standardization, Summer 2021

- Judge, UConn MIS Case Competition, October 2019

- Referee Service

- Computers and Operations Research, Decision Support Systems, Health Care Management Science, IISE Transactions, IISE transactions on Healthcare Systems Engineering, INFORMS Journal on Computing, INFORMS Journal on Data Science, Journal of the Operational Research Society, MIS Quarterly, Naval Research Logistics, Production and Operations Management
- M&SOM Student Paper Competition 2021, 2022, POMS CHOM Best Paper Award competition, 2022

- Session Organizer/Chair

- INFORMS Annual Meeting, POMS Annual Conference, MOPTA

- Student Volunteer

- INFORMS Annual Meeting, 2015, 2016
- MOPTA, 2015, 2016

- Student Organization

- Secretary, INFORMS Lehigh University Student Chapter, 2012
- Committee Member, Hong Kong Institution of Engineers Student Chapter, 2010

## **TEACHING TRAINING**

Teacher Development Program for Graduate Students, Lehigh University, 2012

## **PROFESSIONAL MEMBERSHIPS**

Member: Institute for Operations Research and the Management Sciences (*INFORMS*)

Member: Production and Operations Management Society (*POMS*)