

Miao Bai

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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.

- Advisors: Kalyan S. Pasupathy and Mustafa Y. Sir

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

(* indicates Ph.D. students)

Published

- [1] **M. Bai**, K. Gergelis, M. Sir, T. Whitaker, D. Routman, B. Stish, B. Davis, T. Pisansky, R. 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
- [2] **M. Bai**, M.Y. Sir, K.S. Pasupathy, Pattern-based Surgical Capacity Planning, *Journal of Biomedical Informatics*, Vol 94, 2019.
- [3] **M. Bai**, R.H. Storer, G.L. Tonkay, A Sample Gradient-based Algorithm for Multiple-OR and PACU Surgery Scheduling, *IISE Transactions*, Vol. 49, Issue 4, pp 367-380, 2017.
- [4] H.C. Man, **M. 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).

Published Peer-reviewed Abstracts

- [1] K. Gergelis, **M. Bai**, T. Whitaker, D. Routman, M. Sir, R. 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

Working Papers

- [1] **M. Bai**, R.H. Storer, G.L. Tonkay, Surgery Sequencing Coordination with Recovery Resource Constraints, *Minor revision at INFORMS Journal on Computing*, available on SSRN
- [2] **M. Bai**, R.H. Storer, G.L. Tonkay, T.E. Theman, Reinvestigating Surgery Scheduling in the “To-Follow” Practice, *Reject and resubmit at Manufacturing & Service Operations Management*, available on SSRN
- [3] **M. Bai**, B. Berg, E. Sisikoglu Sir, M.Y. Sir, Partially-partitioned Templating Strategies for Out-patient Specialty Practices, *Major revision at Production and Operations Management*, available on SSRN
- [4] Z. Zhang*, **M. Bai**, Y. Cui, G. Kong, No Panic in Pandemic: The Impact of Individual Choice on Public Health Policy and Vaccine Priority, *Prepare for Submission*, available on SSRN

Work In Progress

- [1] Dynamic Exam Coordination in Radiology Practices, with S. Mehrani*, D. Bergman, C. Cardonha and K.S. Pasupathy
- [2] Online Monitoring with Mobile Sensors: Data-driven Pathwise Sampling Strategies, with X. Xian and D. Li*
- [3] Dynamic Appointment Scheduling considering Patients’ Preferences, with S. Sozuer* and R.H. Storer,

Finished Work

- [1] **M. Bai**, M.Y. Sir, K.S. Pasupathy, Patient-centered Surgery Scheduling in the Spine Surgery Practice at Mayo Clinic.
- Manuscript available upon request.
- [2] **M. Bai**, B. Guven, M.Y. Sir, K.S. Pasupathy, A Novel Approach for Capacity Assessment of Nursing Bay Resources in Radiology.
- B. Guven was an undergraduate mentee; Manuscript available upon request.

MEDIA COVERAGE

- [1] A New Mathematical Model Streamlines Hospital OR Scheduling, Lehigh News, Dec. 29, 2017
- [2] A New Mathematical Model Streamlines Hospital OR Scheduling, Lehigh Research Review, Vol 3, 2018

TEACHING EXPERIENCE

Courses Taught at the University of Connecticut

OPIM3104 Operations Management, 2019-2021

- Fall 2020, rating 4.83/5; enrollment 135; response rate 73%
- Spring 2020, rating: 4.60/5; enrollment 40, response rate 35%
- 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

- Saharnaz Mehrani, Ph.D. dissertation committee member, University of Connecticut, 2020-present
- Sean Conway, Master thesis co-advisor, Lehigh University, 2020-present
- Secil Sozuer, Ph.D. dissertation committee member, Lehigh University, 2017-present

• Undergraduate

- Behic Guven, undergraduate intern, Mayo Clinic, 2018

HONORS & AWARDS

- 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.
- *Van Hoesen Family Best Publication Award*, ISE department, Lehigh University, 2016
- *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

PRESENTATIONS

- [1] M. Bai, B. Berg, E. Sisikoglu Sir, M.Y. Sir, Priority-based templating for outpatient specialty practices
 - INFORMS Healthcare Conference, Cambridge, MA, July 2019.
 - INFORMS Annual Conference, Seattle, WA, October 2019.
 - INFORMS Annual Conference (Virtual), November 2020.
- [2] 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
- [3] M. Bai, Lessons Learned from My Work at Mayo Clinic
 - Healthcare Systems Engineering Seminar, Lehigh University, Bethlehem, PA, February 2020.
- [4] M. Bai, M.Y. Sir, K.S. Pasupathy, Dynamic Coordination of Exams in the Radiology Practice
 - INFORMS Annual Conference, Phoenix, AZ, November 2018.

- [5] 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.
- [6] 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.
- [7] M. Bai, R.H. Storer, G.L. Tonkay, T.E. Theman, Proactive-Reactive Surgery Scheduling with Disruptions
- Presented by R.H. Storer, Department of Industrial and Manufacturing Engineering at the Pennsylvania State University, State College, PA, April 2017.
 - Healthcare Systems Engineering Seminar, Lehigh University, Bethlehem, PA, February 2017.
- [8] 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.
- [9] 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.
- [10] 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.
- [11] 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

- Referee Service

- Computers and Operations Research, Decision Support Systems, Health Care Management Science, IIE Transactions, IIE transactions on Healthcare Systems Engineering, INFORMS Journal on Computing, Journal of the Operational Research Society, Production and Operations Management

- Session Chair
 - INFORMS Annual Meeting, 2016, 2018, 2019
 - MOPTA, 2016
- Volunteer
 - INFORMS Annual Meeting, 2015, 2016
 - MOPTA, 2015, 2016
- 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*)