

MENGFAN XU

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ACADEMIC APPOINTMENT

University of Massachusetts Amherst, United States Assistant Professor, Mechanical and Industrial Engineering	<i>Sep. 2024 - Present</i>
University of Massachusetts Amherst, United States Adjunct Assistant Professor, Manning College of Information & Computer Sciences	<i>Apr. 2025 - Present</i>

EDUCATION

Northwestern University, United States Ph.D. in Industrial Engineering and Management Sciences Dissertation title: “Multi-armed Bandit with Several Agents and Objectives”	<i>Aug. 2018 - Jul. 2024</i>
University of Science and Technology of China, China B.S. in Statistics	<i>Jun. 2018</i>
Yale University, United States BioStats, Summer exchange program	<i>Jun. 2017 - Sep. 2017</i>

RESEARCH INTERESTS

Online Learning, Multi-Agent Systems, Statistical Learning and Algorithm Design, Stochastic Processes and Simulation Optimization, Applications in Operations Research

PROFESSIONAL EXPERIENCE

Machine Learning Engineer Intern at LinkedIn • Developed natural language understanding models and large language models (LLMs) for keywords extraction based on user queries in search AI team; • Prompt engineering and data mining; • Developed a workflow and pipeline to ultimately improve users' search experience	<i>Jun. 2023 - Sep. 2023</i>
Algorithm Engineer at Didi Chuxing • Developed two-staged algorithms that achieve over 25% improvement on baselines for pricing of multiple ride options at Didi; • Developed the very first algorithm with causal forest for model-based route-based pricing of Didi Discount Express and iterated multiple versions with superior performance; • Built data pipelines with Spark for processing billions of data and advancing feature engineering to support large-scale model training and distributional computations; • Built a model pipeline for online recommender systems with causal neural networks; • Conducted research on treatment effect estimation: proving the convergence of GCF for non-parametric DRF, delivering multiple presentations, and completing a paper accepted for oral presentation at KDD 2022	<i>2021</i>

AWARDS AND HONORS

Silver Reviewer at machine learning conference ICML	<i>2026</i>
Meritorious Reviewer at INFORMS Journal on Computing	<i>2025</i>
Top Reviewer at machine learning conference NeurIPS	<i>2024</i>

Honorable Mention at RLC workshop	2024
Spotlight presentation at machine learning conference NeurIPS (top 3%)	2023
Walter P. Murphy Graduate Fellowship, Northwestern University	2018 - 2019
Runner up, Guo Moruo Scholarship, USTC (the highest honor)	2018
National Scholarship, Chinese Ministry of Education (top 1%)	2017
National Scholarship, Chinese Ministry of Education (top 1%)	2016
Mobile Commerce Competition, USTC (top 1)	2016
Scholarship of Minglong Huang, USTC (top 10%)	2015
National High School Mathematics Olympiad, Chinese Mathematics Society The Second Prize in Province	2013

PUBLICATIONS

- J. Li, Z. Qu, and **M. Xu**, *Dynamic Balancing and Matchmaking in Competitive Live-Service Games*. Major Revision at Management Science (MS), 2026.
- M. Xu** and D. Klabjan, *Open Multi-agent Multi-armed Bandit with Applications in Permissionless Blockchain*. International Conference on Artificial Intelligence and Statistics (AISTATS), Tangier, Morocco, 2026.
- W. Shen, Y. Zhang, M. Huang, **M. Xu**, J. Zhang, and C. Shen, *MLorc: Momentum Low-rank Compression for Large Language Model Adaptation*. International Conference on Artificial Intelligence and Statistics (AISTATS), Tangier, Morocco, 2026.
- M. Xu**, L. Shan, F. Ghaffari, X. Wang, X. Liu, and M. Hajiesmaili, *Heterogeneous Multi-agent Multi-armed Bandits on Stochastic Block Models*. Proceedings of the ACM on Measurement and Analysis of Computing Systems (ACM SIGMETRICS/POMACS), Ann Arbor, Michigan, 2026.
- M. Xu** and D. Klabjan, *Multi-agent Multi-armed Bandit Regret Complexity and Optimality*. International Conference on Artificial Intelligence and Statistics (AISTATS), Phuket, Thailand, 2025.
- J. Liu, H. Qiu, L. Yang, and **M. Xu**, *Distributed Multi-agent Bandits Over Erdős-Rényi Random Networks*. Advances in Neural Information Processing Systems (NeurIPS), Vancouver, Canada, 2025.
- X. Wang and **M. Xu**, *Multi-agent Multi-armed Bandit with Fully Heavy-tailed Dynamics*. Winter Simulation Conference (WSC), Seattle, Washington, 2025.
- M. Xu**, *Multi-Armed Bandit With Several Agents and Objectives*. Ph.D. Dissertation, Northwestern University, 2024.
- M. Xu** and D. Klabjan, *Decentralized Blockchain-based Robust Multi-agent Multi-armed Bandit*. Coordination and Cooperation in Multi-Agent Reinforcement Learning (CoCoMARL; **Honorable Mention**), 2024.
- M. Xu** and D. Klabjan, *Decentralized Randomly Distributed Multi-agent Multi-armed Bandit with Heterogeneous Rewards*. Advances in Neural Information Processing Systems (**NeurIPS Spotlight**), New Orleans, Louisiana, 2023.
- M. Xu** and D. Klabjan, *Pareto Regret Analyses in Multi-objective Multi-armed Bandit*. International Conference on Machine Learning (ICML), Honolulu, Hawaii, 2023.
- S. Wan, C. Zheng, Z. Sun, **M. Xu**, X. Yang, H. Zhu, and J. Guo, *GCF: Generalized Causal Forest for Heterogeneous Treatment Effect Estimation in Online Marketplace*. KDD Workshop on Decision Intelligence and Analytics for Online Marketplaces, Washington D.C., 2022.

PRESENTATIONS

Oral Presentation at Next-Generation AI & Machine Learning , Boston, MA <i>Collective Intelligent Decision-Making Under Uncertainty via Multi-Agent Learning</i>	<i>Nov. 2026</i>
Oral Presentation at INFORMS , San Francisco, CA <i>Are Stochastic Multi-objective Bandits Harder than Single-objective Bandits?</i>	<i>Nov. 2026</i>
Oral Presentation at ACM SIGMETRICS , Ann Arbor, MI <i>Heterogeneous Multi-agent Multi-armed Bandits on Stochastic Block Models</i>	<i>June. 2026</i>
Lightning Talk at Mentoring Workshop , Ann Arbor, MI <i>Collective Intelligent Decision Making via Multi-agent Learning</i>	<i>June. 2026</i>
Oral Presentation at IISE , Arlington, TX <i>Multi-agent Bandits Over Erdős-Rényi and Heavy-tailed Random Networks</i>	<i>May. 2026</i>
Oral Presentation at UIUC , Champaign, IL <i>Multi-agent and Multi-objective Learning in Complex Systems</i>	<i>Apr. 2026</i>
Oral Presentation at Northwestern University , Evanston, IL <i>Alumni Seminar</i>	<i>Mar. 2026</i>
Oral Presentation at Mount Holyoke College , Mount Holyoke, MA <i>Multi-agent Bandits Over Erdős-Rényi and Heavy-tailed Random Networks</i>	<i>Feb. 2026</i>
Oral Presentation at DoorDash , Seattle, WA <i>Multi-agent Bandits Over Erdős-Rényi and Heavy-tailed Random Networks</i>	<i>Dec. 2025</i>
Oral Presentation at WSC , Seattle, WA <i>Multi-agent Multi-armed Bandit with Fully Heavy-tailed Dynamics</i>	<i>Dec. 2025</i>
Poster Presentation at NeurIPS , San Diego, CA <i>Distributed Multi-agent Bandits Over Erdos-Rényi Random Networks</i>	<i>Dec. 2025</i>
Oral Presentation at INFORMS , Atlanta, GA <i>Multi-agent Bandits Over Erdős-Rényi and Heavy-tailed Random Networks</i>	<i>Oct. 2025</i>
Oral Presentation at Math Symposium in Association of Women in Math , Amherst, MA <i>Apr. 2025</i> <i>Optimality and Complexity in Decentralized Multi-agent Multi-armed Bandits</i>	
Poster Presentation at Workshop in IMSI , Chicago, IL <i>Multi-agent Multi-armed Bandit with Fully Heavy-tailed Dynamics</i>	<i>Mar. 2025</i>
Oral Presentation at CS Theory Seminar , Amherst, MA <i>Optimality and Complexity in Decentralized Multi-agent Multi-armed Bandits</i>	<i>Feb. 2025</i>
Oral Presentation at INFORMS 2024 , Seattle, WA <i>Decentralized Blockchain-based Robust Multi-agent Multi-armed Bandit</i>	<i>Oct. 2024</i>
Oral Presentation at Northwestern University , Virtual <i>Alumni Seminar</i>	<i>Sep. 2024</i>
Poster Presentation at RLC 2024 , Amherst, MA <i>Decentralized Blockchain-based Robust Multi-agent Multi-armed Bandit</i>	<i>Aug. 2024</i>
Spotlight Presentation at NeurIPS 2023 , New Orleans, LA <i>Decentralized Randomly Distributed Multi-agent Multi-armed Bandit with Heterogeneous Rewards</i>	<i>Dec. 2023</i>
Oral Presentation at INFORMS 2023 , Phoenix, AZ <i>Multi-agent and Multi-objective Multi-armed Bandit</i>	<i>Oct. 2023</i>

- Oral Presentation** at **LinkedIn**, Sunnyvale, California *Sep. 2023*
On natural language understanding and large language models for LinkedIn search recommendation
- Poster Presentation** at **ICML 2023**, Honolulu, Hawaii *Jul. 2023*
Pareto Regret Analyses in Multi-objective Multi-armed Bandits
- Oral Presentation** at **LinkedIn**, Virtual *Oct. 2022*
GCF: Generalized Causal Forest for Heterogeneous Treatment Effect Estimation in Online Marketplace
- Oral Presentation** at **KDD 2022**, Washington DC *Aug. 2022*
GCF: Generalized Causal Forest for Heterogeneous Treatment Effect Estimation in Online Marketplace
- Oral Presentation** at **Northwestern**, Evanston, IL *Jun. 2019*
Fully Sequential Ranking And Selection Procedures With PAC Guarantee, by Y. Zhong, L.J. Hong

TEACHING EXPERIENCE

Instructor at UMass Amherst

- MIE 524: Machine Learning for Dynamic Decision Making (Spring 2027)
- MIE 373: Introduction to Simulation (Spring 2025, 2026)
- MIE 621: Descriptive Analytics (Fall 2024, 2025, 2026)

Teaching Assistant at Northwestern University

- MLDS-400: Everything starts with data (Fall 2023)
- IEMS-404/MLDS-401: Predictive analytics (Fall 2023)

Teaching Assistant at University of Science and Technology of China

- Real analysis (Spring 2017)
- Functions of complex variables (Fall 2016)

STUDENTS

Phd students:

Kenneth Chen (M.S. at University of Chicago), Starting Sep. 2026

Jingqi Fan (co-advised with Prof. Hajiesmaili at CICS, B.S. at Northeastern), Starting Sep. 2026

Zirui Liu (co-advised with Prof. Ma at CICS, M.S. at University of California Irvine)

Bingnan Huo (M.S. at Brown University)

Undergraduate students:

Jingyuan Liu, Oct. 2024 - Present (at Nanjing University)

- incoming graduate student at UC Berkeley

John Wang, Sept. 2025 - Present (at UMass Amherst)

- now graduate student at UMass

Jose Cruz, Dec. 2024 - July 2025 (at UMass Amherst)

- now graduate student at UMass

Jingshuai Zhang, Sep. 2024 - July 2025 (at University of Minnesota - Twin Cities)

- now graduate student at UPenn

Jessica Lanin, Spring 2023 (at Northwestern)

Alejandra Bustamante, Spring 2023 (at Northwestern)

Tom Muma Ratemo, Spring 2023 (at Northwestern)

Tyler Shannon, Spring 2023 (at Northwestern)

Konyin Rilwan Okubadejo, Spring 2023 (at Northwestern)

PROFESSIONAL ACTIVITIES

Track Co-chair/organizer:

- IISE Annual Meeting & Conference, 2026

Session Chair:

- INFORMS Annual Meeting, 2026, 2025, 2024

Program Committee:

- Reviewer - AISTATS, NeurIPS, ICML, ICLR, ACML
- PC - ACM SIGMETRICS, International Workshop on Large Language Model Supply Chain Analysis (LLMSC 2025)

Journal Reviewer:

- INFORMS Journal on Computing
- TMLR
- OMEGA
- IISE
- IEEE TON

PhD Committee:

- Bingnan Huo, PhD student, Industrial Engineering at UMass Amherst
- Zirui Liu, PhD student, CICS at UMass Amherst
- Kelvin Ekun R., PhD student, Industrial Engineering at UMass Amherst
- Sonza Singh, PhD student, Industrial Engineering at UMass Amherst
- JaEon Cho, PhD student, Biomedical Engineering at UMass Amherst
- Amirmahdi Mirfakhar, PhD student, CICS at UMass Amherst
- Fatemeh Ghaffari, PhD student, CICS at UMass Amherst

Master Committee:

- Stephen Onyeukwu, PhD student, Industrial Engineering at UMass Amherst

Faculty Advisor:

- Undergraduate Club at UMass Amherst for Institute of Industrial and Systems Engineers (IISE), 2024-2025, 2025-2026
- Client Project Challenge (CPC) at Northwestern University, Spring 2024

Judge:

- Research Symposium, College of Engineering at UMass Amherst, 2025

Panelist:

- Data Science Night, Northwestern University, October 2024
- Academia Job Search, Northwestern University, April 2024

SKILLS

Programming: Python, R, SQL, Scala, C; Linux, Spark, Hadoop, Kubernetes, Pytorch, GCC

Selected taken courses: Statistical learning, Probability theory, Algorithms, Convex optimization, Dynamic optimization, Stochastic analysis, Mathematical statistics, Real analysis, Functional analysis, Complex analysis, Algebra, Bayesian statistics

REFERENCES

Diego Klabjan

Professor of Industrial Engineering and Management Sciences

Director of Master of Science in Machine Learning and Data Science Program

Director of Center for Deep Learning

Department of Industrial Engineering and Management Sciences

McCormick School of Engineering

Northwestern University

Barry Nelson

Walter P. Murphy Professor Emeritus of Industrial Engineering and Management Sciences

Department of Industrial Engineering and Management Sciences

McCormick School of Engineering

Northwestern University

Achal Bassamboo

Charles E. Morrison Professor of Decision Sciences

Professor of Operations, Chair of Operations Department

Co-Director of MMM Program

Kellogg School of Management

Northwestern University

Zhaoran Wang

Associate Professor of Industrial Engineering and Management Sciences

Associate Professor of Computer Science (by courtesy)

Department of Industrial Engineering and Management Sciences

McCormick School of Engineering

Northwestern University