

Qinyi Chen

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Education

Massachusetts Institute of Technology (MIT), Cambridge, MA 09/2020-05/2025 (Expected)

Ph.D. Candidate in Operations Research, GPA: 5.0/5.0.

Research focus: Online Learning, Fairness, Approximation Algorithms, Games and Auctions, Revenue Management, Online Platforms and Marketplaces.

Advisor: Prof. Negin Golrezaei

University of California, Los Angeles (UCLA), Los Angeles, CA 09/2016-03/2020

B.S. in Applied Mathematics, Specialization in Computing, GPA: 3.99/4.00.

Summa Cum Laude, College Honors, Departmental Honors, Phi Beta Kappa.

Research

Bidding in Ad Auctions with Budgets and Varying Update Frequencies, MIT. 04/2022-Present

- Designed and implemented two adaptive pacing bidding strategies for second-price ad auctions, using online mirror descent (OMD) and bandit gradient descent (BGD) schemes.
- Studied conditions under which the bidding strategies constitute Nash/Stackelberg equilibrium.

Fair Assortment Planning for Online Platforms, MIT. 07/2021-Present

- Formulated a novel linear optimization problem that (i) maximizes a platform's revenue/market share and (ii) ensures fair exposure for all items on the platform. Showed its NP-completeness.
- Designed a series of polynomial-time near-optimal algorithms (1/2-approximate algorithm, PTAS, dynamic programming based FPTAS) and provided theoretical guarantees.
- Applied the algorithms to the MovieLens dataset with 100K reviews and showed their efficacy.

Dynamic Bandits with Temporal Structure, MIT (in partnership with IBM Research). 10/2020-Present

- Formulated a multi-armed bandit problem where the rewards follow autoregressive time series.
- Designed a novel learning algorithm (AR2) that attains near-optimal performance compared to the best dynamic policy in hindsight and provided theoretical lower/upper regret bounds.
- Implemented AR2 and numerically demonstrated its superiority over multiple benchmarks.

Subgraph Matching on Multiplex Networks, UCLA. 04/2018-08/2020

- Developed a suite of filtering algorithms for subgraph isomorphism detection on multiplex networks.
- Created open-source Python packages for subgraph matching and optimization algorithms, which display top performance on both real-world data and synthetic data created by DARPA.

Continuous-Time Contagions on Tie-Decay Temporal Networks, UCLA. 01/2019-06/2020

- Formulated a continuous-time SIR model on tie-decay networks and derived its epidemic threshold.
- Implemented a fast simulation algorithm for epidemic processes on tie-decay networks.

Online Resource Allocation with Non-Stationary Arrivals, UCLA & Alibaba. 06/2019-08/2019

- Developed and implemented an online learning and optimization algorithm that dynamically learns customer preferences and arrival rates to allocate resources in a profit-maximizing way.

Publications

1. "Fair Assortment Planning", with N. Golrezaei, and F. Susan, under review at Management Science.

Preprint available at Arxiv: <https://arxiv.org/abs/2208.07341>.

- Accepted at 2022 Revenue Management & Pricing Conference, Spotlight Talk
- Accepted at 2022 MSOM Service Management SIG Conference (acceptance rate: 12%)
- Finalist, INFORMS IBM Service Science Best Student Paper Award

- Finalist, INFORMS Social Media Analytics Best Student Paper Competition
- Honorable Mention, INFORMS Minority Issue Forum Student Poster Competition

2. "Dynamic Bandits with an Auto-Regressive Temporal Structure", with N. Golrezaei and D. Bouneffouf, under review at AISTATS. Preprint available at SSRN: <http://ssrn.com/abstract=3887608>.

3. "Epidemic Thresholds of Infectious Diseases on Tie-Decay Networks", with M.A. Porter, Journal of Complex Networks, 10(1): cnab031, February, 2022.

4. "Subgraph Matching on Multiplex Networks", with J.D. Moorman, T.K. Tu, X. He, and A.L. Bertozzi, IEEE Transactions on Network Science and Engineering, 8(2): 1367-1384, February, 2021.

5. "Inexact Attributed Subgraph Matching", with T.K. Tu, J.D. Moorman, D. Yang, and A.L. Bertozzi, 2020 IEEE International Conference on Big Data (Big Data), pages 2575-2582, December, 2020.

6. "Online Learning and Matching for Resource Allocation Problems", with A. Boskovic, D. Kufel, and Z. Zhou, SIAM Undergraduate Research Online (SIURO), 13: 207-230, October, 2020.

7. "Filtering Methods for Subgraph Matching on Multiplex Networks", with J.D. Moorman, T.K. Tu, Z.M. Boyd, A.L. Bertozzi, 2018 IEEE International Conference on Big Data (Big Data), pages 3980-3985, December, 2018.

Honors and Awards

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| 1. Finalist, INFORMS IBM Service Science Best Student Paper Award | 2022 |
| 2. Finalist, INFORMS Social Media Analytics Best Student Paper Competition | 2022 |
| 3. Honorable Mention, INFORMS Minority Issue Forum Student Poster Competition | 2022 |
| 4. Daus Scholarship in Mathematics (awarded to a top-ranked student in mathematics), UCLA | 2020 |
| 5. Outstanding Poster Award, Joint Mathematics Meetings | 2020 |

Presentations

"Fair Assortment Planning"

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| - 2022 INFORMS Annual Meeting | 10/2022 |
| - Young Researchers Workshop, Cornell University | 10/2022 |
| - MSOM Service Management SIG Conference | 06/2022 |
| - Revenue Management & Pricing Conference, Spotlight Presentation | 06/2022 |
| - EC'22 Poster Session | 06/2022 |
| - Marketplace Innovation Workshop (MIW) | 05/2022 |

"Dynamic Bandits with Temporal Structure"

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| - Data, Learning and Markets workshop at C3.ai Digital Transformation Institute | 10/2022 |
| - IJCAI-ECAI 2022 Doctoral Consortium | 07/2022 |
| - MIT-IBM Watson AI Lab Poster Session | 04/2022 |
| - 2021 INFORMS Annual Meeting | 10/2021 |
| - MIT-IBM Watson AI Lab Poster Session | 04/2021 |

"Online Approaches for Allocating Products to Users"

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| - 2020 Joint Mathematics Meetings | 01/2020 |
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Activities

Visiting Graduate Student, Learning and Games Program, Simons Institute at UC Berkeley	Spring 2022
Student Coordinator, MIT Operations Management Seminar Series	Spring & Fall 2022
Reviewer for ICML 2022, NeurIPS 2022	

Skills

Programming: Python, Matlab, LaTeX, Julia, C++, Git, Mathematica
Languages: English (proficient), Mandarin (native), Spanish (basic)