Ayoub Foussoul

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Education

University of Chicago Booth School of Business 2025 –
Postdoctoral Researcher *Chicago, IL*

Columbia University 2020 – 2025
Ph.D candidate in Operations Research *New York, NY*

- Advisor: Vineet Goyal
- Thesis: Robust and Tractable Policies for Resource Allocation Under Uncertainty.

Ecole Polytechnique 2017 – 2020
Master of Science in Applied Mathematics *Paris, France*
Bachelor of Science in Mathematics and Computer Science

Lycée Moulay Youssef 2015 – 2017
Classes préparatoires, Mathematics, Physics, Computer Science *Rabat, Morocco*

Research Interests

Methodology: Deep Learning, Deep Reinforcement Learning, Sequential Decision Making under Uncertainty.
Applications: Supply Chain and Inventory Management, Matching Markets.

Papers

[1] Distributionally Robust Newsvendor on a Metric (`link`)
Ayoub Foussoul & Vineet Goyal.
Major Revision in ***Operations Research***
Extended abstract appeared in proceedings of ***EC 2025***

[2] LP-based Approximations for Disjoint Bilinear and Two-Stage Adjustable Robust Optimization (`link`)
Omar El Housni, Ayoub Foussoul & Vineet Goyal.
Mathematical Programming
Preliminary version appeared in proceedings of ***IPCO 2022***

[3] Two-Stage Stochastic Stable Matching (`link`)
Ayoub Foussoul, Yuri Faenza & Chengyue He.
In proceedings of ***IPCO 2024***

[4] Minimum Cut Representability of Stable Matching Problems (`link`)
Ayoub Foussoul, Yuri Faenza & Chengyue He.
Major Revision in ***Operations Research***
⋆ *Honorable Mention INFORMS Optimization Society, 2025 Student Paper Prize*

[5] Fully-Dynamic Load Balancing (`link`)
Ayoub Foussoul, Vineet Goyal & Amit Kumar.
Mathematical Programming
Preliminary version appeared in proceedings of ***IPCO 2024***

[6] Last Switch Dependent Bandits with Monotone Payoff Functions (`link`)
Ayoub Foussoul, Vineet Goyal, Orestis Papadigenopoulos & Assaf Zeevi.
In proceedings of ***ICML 2023***

[7] MNL-Bandit in Non-Stationary Environments (`link`)
Ayoub Foussoul, Vineet Goyal & Varun Gupta.

Technical Reports

[1] Conditioning of Piecewise Linear Approximations with an Application to the Monitoring of the COVID-19 Epidemic
Marianne Akian, Jérôme Bolt, Ayoub Foussoul, Stephane Gaubert & Laurent Massoulié.
⋆ *École Polytechnique Research Prize in Applied Mathematics*

[2] Identification of the Optimal Tropical Hypersurfaces Explaining Consumers' Responses to Prices
Xavier Allamigeon, Ayoub Foussoul & Stephane Gaubert.
⋆ *École Polytechnique Research Prize in Applied Mathematics*

Teaching Experience

Optimization I, IEOR E6613 Fall 2021, 2022
Core PhD course on linear and convex optimization
Teaching Assistant & Guest Lecturer

Optimization II, IEOR E6614 Spring 2023, 2024, 2025
Core PhD course on combinatorial optimization
Teaching Assistant

Convex Optimization, IEOR E6616 Spring 2022
PhD course on convex optimization
Teaching Assistant

Optimization Methods, IEOR E4004 Fall 2023
Core Master's course on optimization
Teaching Assistant & Guest Lecturer

Applications for Financial Engineering, IEOR E4500 Spring 2021
Master's course on quantitative methods in financial engineering
Teaching Assistant

Academic Tutor, Le Valdocco 2017-2018
Provided academic support and mentoring to underprivileged students at a non-profit educational organization

Industry Experience

INRIA Mar 2020 - Sep 2020
Research Intern *Paris, France*

- **Constrained piecewise-linear approximation for epidemic monitoring:** Developed a dynamic-programming method for constrained piecewise-linear approximation in L_p norms ($p \geq 1$) and applied it to French COVID-19 observables (SIVIC/SAMU) (see acknowledgments in paper).
- **VC dimension of tropical polynomials:** Studied tropical polynomial classifiers and proved that the VC dimension of tropical polynomials matches that of classical real polynomials.

Padoa Jun 2019 – Sep 2019
Data Analyst Intern *Paris, France*

Occupational-medicine platform connecting clinicians, employers, and employees.

- Implemented a Health Statistics page in the clinician-facing web app.
- Extended the backend Stats API to expose the KPI/statistics required by the new dashboard.

Service and Outreach

Elected Student Representative, École Polytechnique (Class of 2020)

Co-organizer of IEOR PhD Tutorial Series

Reviewer: Management Science, Mathematical Programming, Optimization Letters, NeurIPS MLxOR Workshop, INFORMS Journal on Computing, IPCO, SODA, STOC.

Awards

Honorable Mention in the INFORMS Optimization Society Student Paper Prize	2025
Postgraduate Excellence Scholarship (OCP Foundation)	2020
École Polytechnique Research Prize in Applied Mathematics	2020
French Government Major-Excellence Scholarship	2017

Talks

Distributionally Robust Newsvendor on a Metric

- INFORMS Annual Meeting, October 2025, Atlanta GA
- Revenue Management and Pricing Conference (RMP), July 2025, New York NY
- ACM Conference on Economics and Computation (EC), July 2025, Stanford CA
- Manufacturing & Services Operation Management Conference (MSOM), June 2025, London
- Columbia University Data Science Day, April 2025, New York NY (poster session)
- IEOR Colloquium, November 2024, New York NY
- INFORMS Annual Meeting, October 2024, Seattle WA
- Cornell ORIE Young Researchers Workshop, October 2024, Ithaca NY
- Northwestern Kellogg Operations Management Rookiepalooza, October 2024, Evanston IL

Two-Stage Stochastic Stable Matching

- Integer Programming and Combinatorial Optimization Conference (IPCO), July 2024, Wrocław
- Columbia University Data Science Day, April 2024, New York NY (poster session)

Fully-Dynamic Load Balancing

- Integer Programming and Combinatorial Optimization Conference (IPCO), July 2024, Wrocław
- Columbia IEOR Student Seminar, February 2024, New York NY

Last Switch Dependent Bandits with Monotone Payoff Functions

- International Conference on Machine Learning (ICML), July 2023, Honolulu HI (poster session)

MNL-Bandit in Non-Stationary Environments

- DSI Financial and Business Analytics Poster Session, November 2023, New York NY (poster session)
- INFORMS Annual Meeting, October 2023, Phoenix AZ
- Revenue Management and Pricing Conference (RMP), July 2023, London

LP-based Approximations for Disjoint Bilinear and Two-Stage Adjustable Robust Optimization

- International Symposium on Mathematical Programming (ISMP), July 2024, Montréal
- International Research and Innovation Seminar (IRIS), December 2023, Ben Guerir
- INFORMS Annual Meeting, October 2022, Indianapolis IN
- International Conference on Continuous Optimization (ICCOPT), July 2022, Bethlehem PA
- Integer Programming and Combinatorial Optimization Conference (IPCO), June 2022, Eindhoven
- INFORMS Optimization Society Conference (IOS), March 2022, Greenville SC