# Moïse Blanchard

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## Academic History

**Georgia Institute of Technology**, Atlanta, GA *2025 – to date*
Tennenbaum Early Career Professor and Assistant Professor
H. Milton Stewart School of Industrial and Systems Engineering (ISyE)

**Columbia University**, New York, NY *2024 – 2025*
Postdoctoral Fellows Program
Data Science Institute (DSI)

**Massachusetts Institute of Technology**, Cambridge, MA *2019 – 2024*
Ph.D. Student in Operations Research
Operations Research Center (ORC), Laboratory for Information & Decision Systems (LIDS). GPA 5.0/5.0
*Advisor: Prof. Patrick Jaillet*

**École Polytechnique**, Palaiseau, France *2016 – 2020*
B.Sc. and M.Sc. in Applied Mathematics, **Valedictorian**
Minor: Computer Science, Mathematics, Physics. GPA 4.0/4.0

**Lycée Louis-le-Grand**, Paris, France *2014 – 2016*
Classes Préparatoires
Mathematics, Physics, and Computer Science. GPA 4.0/4.0

## Research Interests

Statistical Decision-Making: online learning, contextual bandits

Machine Learning: learning with unstructured data, algorithm design, high-dimensional statistics

Optimization: optimization under memory constraints, discrete optimization

## Publications (authorship order by contribution, equal contribution marked with *)

### Journal Publications

J1 Moïse Blanchard, Patrick Jaillet. Universal regression with adversarial responses.
*Annals of Statistics (AoS), 2023*

J2 Moïse Blanchard*, Adam Q. Jaffe*. Fréchet mean set estimation in the Hausdorff metric, via relaxation.
*Bernoulli, 2023*

J3 Moïse Blanchard, Junhui Zhang, Patrick Jaillet. Quadratic memory is necessary for optimal query complexity in convex optimization: Center-of-mass is Pareto-optimal.
*Mathematics of Operations Research (MOR), 2023*

J4 Moïse Blanchard, Alexandre Jacquillat, Patrick Jaillet. Probabilistic bounds on the k-Traveling Salesman Problem and the Traveling Repairman Problem.
*Mathematics of Operations Research (MOR), 2022*
**Winner of INFORMS Transportation Science & Logistics (TSL) 2023 Best student paper award**

J5 Moïse Blanchard, Jesús A. De Loera, Quentin Louveaux. On the length of monotone paths in polyhedra.
*SIAM Journal on Discrete Mathematics, 2021*
**Winner of the Rivot medal for outstanding research, French Science Academia**

## Conference Publications

C1 Moïse Blanchard. Agnostic smoothed online learning.
*Symposium on Theory of Computing (STOC), 2025*

C2 Yan Dai*, Moïse Blanchard*, Patrick Jaillet. Non-Monetary Mechanism Design without Distributional Information: Using Scarce Audits Wisely.
*Conference on Learning Theory (COLT), 2025*

C3 Noah Krever, Jakub Černý, Moïse Blanchard, Christian Kroer. GUARD: Constructing Realistic Two-Player Matrix and Security Games for Benchmarking Game-Theoretic Algorithms.
*The Thirty-Ninth Annual Conference on Neural Information Processing Systems (NeurIPS), 2025*
Spotlight at NeurIPS in Datasets and Benchmark Track

C4 Moïse Blanchard. Gradient Descent is Pareto-Optimal in the Oracle Complexity and Memory Tradeoff for Feasibility Problems.
*Symposium on Foundations of Computer Science (FOCS), 2024*

C5 Moïse Blanchard*, Doron Cohen*, Aryeh Kontorovich*. Correlated Bernoulli Process.
*Conference on Learning Theory (COLT), 2024*

C6 Moïse Blanchard, Václav Voráček. Tight bounds for local Gliveko-Cantelli.
*International Conference on Algorithmic Learning Theory (ALT), 2024*

C7 Moïse Blanchard, Junhui Zhang, Patrick Jaillet. Quadratic memory is necessary for optimal query complexity in convex optimization: Center-of-mass is Pareto-optimal.
*Conference on Learning Theory (COLT), 2023*

C8 Moïse Blanchard, Junhui Zhang, Patrick Jaillet. Memory-constrained algorithms for convex optimization.
*Advances in Neural Information Processing Systems (NeurIPS), 2023*

C9 Moïse Blanchard. Universal online learning: An optimistically universal learning rule.
*Conference on Learning Theory (COLT), 2022*
**Best Student Paper Runner-up Award, COLT**

C10 Moïse Blanchard*, Romain Cosson*. Universal online learning with bounded loss: Reduction to binary classification.
*Conference on Learning Theory (COLT), 2022*

C11 Moïse Blanchard*, Romain Cosson*, Steve Hanneke. Universal online learning with unbounded losses: Memory is all you need.
*International Conference on Algorithmic Learning Theory (ALT), 2022*

C12 Moïse Blanchard, Amine Bennouna. Shallow and deep networks are near-optimal approximators of Korobov functions.
*International Conference on Learning Representations (ICLR), 2022*

## Preprints

P1 Moïse Blanchard, Vineet Goyal. Collaborative Min-Max Regret in Grouped Multi-Armed Bandits.
*Submitted to Operations Research, 2025*

P2 Moïse Blanchard, Samory Kpotufe. Distributionally-Constrained Adversaries in Online Learning.
*Submitted to Journal of Machine Learning Research (JMLR), 2025*

P3 Moïse Blanchard*, Adam Quinn Jaffe*, Nikita Zhivotovskiy. Consistency and Inconsistency in $k$-Means Clustering.
*Submitted to Electronic Journal of Statistics, 2025*

P4 Moïse Blanchard, Patrick Jaillet. Near-optimal mechanisms for resource allocation without monetary transfers.
*Major revision at Operations Research, 2024*

P5 Moïse Blanchard, Steve Hanneke, Patrick Jaillet. Adversarial Rewards in Universal Learning for Contextual Bandits.
*Major revision at Journal of Machine Learning Research (JMLR), 2024*

P6 Moïse Blanchard, Steve Hanneke, Patrick Jaillet. Contextual bandits and optimistically universal learning.
*Major revision at Mathematics of Operations Research, 2024*

## Talks

### Agnostic Smoothed Online Learning

- Symposium on Theory of Computing (STOC) *June 2025*

### Gradient Descent is Pareto-Optimal in the Oracle Complexity and Memory Tradeoff for Feasibility Problems

- INFORMS Annual Meeting *Oct 2025*
- Invited talk at Workshop on Information and Learning (WIL), London Business School *June 2025*
- Invited talk at University of Southern California, Computer science department *June 2025*
- Invited talk at Georgia Institute of Technology, ISyE. Discrete Optimization Seminar *Mar 2025*
- Symposium on Foundations of Computer Science (FOCS) *Oct 2024*
- Invited Talk at Google. Learning Theory Seminar *Aug 2024*

### Near-optimal mechanisms for resource allocation without monetary transfers

- INFORMS Annual Meeting *Oct 2024*

### Universal learning: consistency under minimal data assumptions

- Seminar class for 1st year PhD students, Georgia Institute of Technology, ISyE *Sep 2025*
- Invited talk at Columbia University, IEOR. Applied Probability Seminar *Oct 2024*

### Correlated Bernoulli Process

- Conference on Learning Theory (COLT) *Jul 2024*

### Tight bounds for Glivenko-Cantelli

- International Conference on Algorithmic Learning Theory (ALT) *Feb 2024*

### Universal Learning for Decision-Making

- Invited talk at Imperial College London, Analytics and Operations *Jan 2024*
- Invited talk at University of California San Diego, HDSI *Jan 2024*
- Invited talk at University of Southern California, ISE *Jan 2024*
- Invited talk at Duke University, Fuqua Business School, Decision Sciences *Jan 2024*
- Invited talk at New York University, Stern Business School, OM *Jan 2024*
- Invited talk at Georgia Institute of Technology, ISyE *Dec 2023*
- Invited talk at Norwestern University, Kellogg Business School, Operations *Nov 2023*

### Memory-constrained algorithms for convex optimization

- Conference on Neural Information Processing Systems (NeurIPS) *Dec 2023*

### Quadratic memory is necessary for optimal query complexity in convex optimization: Center-of-mass is Pareto-optimal

- Conference on Learning Theory (COLT) *Jul 2023*
- Invited talk at Toyota Technological Institute at Chicago (TTIC) *Apr 2023*
- LIDS & Statistics Student Seminar, MIT *Mar 2023*

### Contextual bandits and optimistically universal learning

- INFORMS Annual Meeting *Oct 2023*
- Cornell Young Research Workshop, Cornell ORIE *Oct 2023*
- LIDS & Statistics Student Seminar, MIT *Nov 2022*
- Operations Research Student Seminar, MIT *Oct 2022*

### Universal regression with adversarial responses

- INFORMS Annual Meeting *Oct 2022*
- Invited talk at Université Pierre et Marie Curie, Laboratoire Jacques-Louis Lions *Mar 2022*
- LIDS Conference, MIT *Feb 2022*

Realizable online learning with minimal assumptions

- Conference on Learning Theory (COLT): "Universal online learning: an optimistically universal learning rule" *Jul 2022*
- Conference on Learning Theory (COLT): "Universal online learning with bounded loss: Reduction to binary classification" *Jul 2022*
- International Conference on Algorithmic Learning Theory (ALT) : "Universal online learning with unbounded loss: memory is all you need" *Mar 2022*
- Operations Research Student Seminar, MIT *Nov 2021*

Probabilistic bounds on the k-Traveling Salesman and Traveling Repairman Problems

- INFORMS Annual Meeting, Transportation Science & Logistics award session *Oct 2023*

The representation power of neural networks for Korobov functions

- International Conference on Learning Representations (ICLR) *Apr 2021*
- MIT SIAM Conference *Oct 2021*
- Operations Research Student Seminar, MIT *Mar 2021*

Online matchings on unknown bipartite graphs

- INFORMS Annual Meeting *Oct 2020*

## Teaching Experience

**Instructor: Computational Statistics** (ISyE 6416), *Georgia Tech* *Fall 2025*

- Qualifying course for PhD in Statistics (ISyE)

**Teaching Assistant: Optimization Methods** (6.215/15.093J), *MIT* *Fall 2021*

- Qualifying course for PhD in Electrical Engineering and Computer Science (EECS)
- Core course of the Master of Business Analytics (MBAn)

**Teaching Assistant: Advanced Analytics Edge** (MBAn) (15.072), *MIT* *Fall 2020*

- Core course of the Master of Business Analytics (MBAn)

**Instructor for Classes Préparatoires**, *Lycée Condorcet and Henry IV, Paris, France* *2017 - 2019*

- Led and evaluated oral exams for undergraduate students in mathematics
- Designed practice material in real and complex analysis, algebra, differential equations, and probability

## Grants and Awards

- Columbia University Data Science Institute (DSI) Postdoctoral fellowship *2024*
- Winner INFORMS Transportation Science & Logistics (TSL) Best student paper award *2023*
- **Air Force Office of Scientific Research Grant**, with Prof. Patrick Jaillet *2023*
- Prize for solving a COLT 2019 open problem in Memory-constrained Convex Optimization *2023*
- **COLT Best Student Paper Runner-Up Award** *2022*
- Prize for solving COLT 2021 open problems in Universal Learning *2022*
- Best Presentation Award, Laboratory of Information and Decision Systems Conference, MIT *2022*
- DeepMind Student Grant for COLT *2022*
- Bronze medal, Alibaba Global Mathematics Competition *2022*
- Honorable mention, Alibaba Global Mathematics Competition *2021*
- 2nd Prize, The East Coast Data Open by Citadel *2020*
- Laplace medal given to Valedictorian of École Polytechnique, French Science Academia *2019*
- Rivot medal for outstanding research at École Polytechnique, French Science Academia *2019*
- Bronze medal, International Physics Olympiad (IPhO) *2015*
- Bronze medal, International Mathematics Olympiad (IMO) *2014*
- Silver medal, Junior Balkanic Mathematics Olympiad (JBMO) *2014*
- 1st Prize, Concours Général in Mathematics, France *2014*

## Work and Research Experience

**Georgia Institute of Technology, ISyE**, Assistant Professor, Atlanta, GA *Aug 2025 – to date*

**Columbia University, DSI**, Postdoctoral research scientist, New York, NY *Aug 2024 – June 2025*

**MIT, ORC & LIDS**, Research assistant, Cambridge, MA *Sep 2019 – May 2024*

- Designed general-use algorithms for learning unrestricted tasks with minimal assumptions, for supervised learning and contextual bandits
- Analyzed the impacts of memory constraints for optimization and provided memory-efficient algorithms

**Amazon Inc.**, Research intern, Cambridge, MA *Apr 2020 – Jul 2020*

- Co-developed a prediction model for the value of new vendors for Amazon's vendor flex program
- Developed a mixed-integer optimization formulation to inform the selection of new vendors

**University of California, Davis**, Research assistant with Prof. Jesús De Loera, Davis, CA *Apr 2019 – Aug 2019*

- Analyzed conditions for the fast convergence of simplex methods in combinatorial problems by studying the length of monotone paths
- Supervised two undergraduate students to conduct empirical research on fast pivot rules for combinatorial polyhedra

**INRIA**, Undergraduate researcher with Prof. Laurent Massoulié, Paris, France *Sep 2018 – Mar 2019*

- Provided theoretical analysis for the problem of reconstructing lattice graphs from local neighborhoods, tightening phase transition bounds from previous works
- Developed algorithms for efficient lattice recovery

**École Polytechnique**, Undergraduate researcher with Prof. Gabriel Peyré, Palaiseau, France *Sep 2017 – Mar 2018*

- Applied optimal transport to natural language recognition and classification

## Reviewing Service

Journals: Operations Research, Mathematics of Operations Research, INFORMS Journal on Optimization, INFORMS Journal on Computing, Machine Learning, Journal of the ACM, Journal of Machine Learning Research, Discrete Optimization

Conferences: COLT (2024-2025), SODA (2025), NeurIPS (2021-2025), ICML (2023-2024), ICLR (2022), ALT (2023-2024)

## REFERENCES

Patrick Jaillet, MIT
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Assistant Professor of Operations Research (ORC)
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Samory Kpotufe, Columbia University
Professor of Statistics
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