

MOÏSE BLANCHARD

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EDUCATION

- 2019 - **Massachusetts Institute of Technology**, Cambridge, MA
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
- 2016 - 2020 **École Polytechnique**, Palaiseau, France
B.SC. AND M.SC. IN APPLIED MATHEMATICS, **Valedictorian**
Minor: Computer Science, Mathematics, Physics. GPA 4.0/4.0
- 2014 - 2016 **Lycée Louis-le-Grand**, Paris, France
CLASSES PRÉPARATOIRES
Mathematics, Physics, and Computer Science. GPA 4.0/4.0

RESEARCH INTERESTS

STATISTICAL DECISION-MAKING: online learning, contextual bandits, reinforcement learning

MACHINE LEARNING: learning with unstructured data, algorithm design, high-dimensional statistics

OPTIMIZATION: optimization under resource constraints, discrete optimization

PUBLICATIONS (authorship order by contribution, equal contribution marked with a *)

JOURNAL PUBLICATIONS

- 2023 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. *Major Revision, Bernoulli*
- 2022 J3 **Moïse Blanchard**, Alexandre Jacquillat, Patrick Jaillet. Probabilistic bounds on the k-Traveling Salesman Problem and the Traveling Repairman Problem. *Mathematics of Operations Research (MOR)*
Finalist for INFORMS Transportation Science & Logistics (TSL) 2023 Best student paper award
- 2021 J4 **Moïse Blanchard**, Jesús A. De Loera, Quentin Louveaux. On the length of monotone paths in polyhedra. *SIAM Journal on Discrete Mathematics*
Winner of the Rivot medal for outstanding research, French Science Academia

CONFERENCE PUBLICATIONS

- 2023 C1 **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)*
- 2022 C2 **Moïse Blanchard**. Universal online learning: An optimistically universal learning rule. *Conference on Learning Theory (COLT)*
Best Student Paper Runner-up Award, COLT
- 2022 C3 **Moïse Blanchard***, Romain Cosson*. Universal online learning with bounded loss: Reduction to binary classification. *Conference on Learning Theory (COLT)*
- 2022 C4 **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 C5 **Moïse Blanchard**, Amine Bennouna. Shallow and deep networks are near-optimal approximators of Korobov functions. *International Conference on Learning Representations (ICLR)*

PRE-PRINTS

- 2023 P1 **Moïse Blanchard**, Junhui Zhang, Patrick Jaillet. Memory-constrained algorithms for convex optimization. *Submitted to Advances in Neural Information Processing Systems (NeurIPS)*
- 2023 P2 **Moïse Blanchard**, Václav Voráček. Tight bounds for local Gliveko-Cantelli.
- 2022 P3 **Moïse Blanchard**, Steve Hanneke, Patrick Jaillet. Adversarial Rewards in Universal Learning for Contextual Bandits. *Submitted to Journal of Machine Learning Research (JMLR)*
- 2022 P4 **Moïse Blanchard**, Steve Hanneke, Patrick Jaillet. Contextual bandits and optimistically universal learning. *Submitted to Mathematics of Operations Research*

SELECTED TALKS

- Jul 2023 • “Quadratic memory is necessary for optimal query complexity in convex optimization: Center-of-mass is Pareto-optimal”, Conference on Learning Theory (COLT)
- Apr 2023 • “Memory-constrained convex optimization: is cutting-planes optimal?”, Invited talk at Toyota Technological Institute at Chicago (TTIC)
- Oct 2022 • “Universal regression with Adversarial Responses”, INFORMS Annual Meeting
- Jul 2022 • “Universal Online Learning: an optimistically universal learning rule”, Conference on Learning Theory (COLT)
- Jul 2022 • “Reduction from binary classification for universal online learning”, Conference on Learning Theory (COLT)
- Mar 2022 • “Learnability in universal online learning and adversarial regression”, Invited talk at Université Pierre et Marie Curie, Laboratoire Jacques-Louis Lions
- Mar 2022 • “Universal online learning with unbounded loss: memory is all you need”, International Conference on Algorithmic Learning Theory (ALT)
- Feb 2022 • “Learnability in online learning”, LIDS Student Conference, MIT, **Best presentation award**
- Oct 2021 • “The representation power of neural networks for Korobov functions”, SIAM Seminar, MIT
- Oct 2020 • “Online matchings on unknown bipartite graphs”, INFORMS Annual Meeting

TEACHING EXPERIENCE

- Fall 2021 • **Optimization Methods** (6.215/15.093J), MIT
Core course of the Master of Business Analytics (MBAn)
Prepared and gave recitations, helped design homeworks, exams, and discussion sections.
- Fall 2020 • **Advanced Analytics Edge** (MBAn) (15.072), MIT
Core course of the Master of Business Analytics (MBAn)
Gave recitations, helped design homeworks and discussion sections.
- 2017 - 2019 • **Instructor for Classes Préparatoires**, *Lycée Condorcet and Lycée Henry IV, Paris, France*
Designed and gave exam practice sessions for undergraduate students in mathematics.

GRANT AND HONORS

- 2023 • Finalist for INFORMS Transportation Science & Logistics (TSL) Best student paper award
- 2023 • Air Force Office of Scientific Research Grant (AFOSR), Information and Networks (RTA2), with Prof. Patrick Jaillet
- 2023 • Prize for solving a COLT 2019 open problem in Memory-constrained Convex Optimization
- 2022 • **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
- 2021 - 2022 • Bronze medal (2022), Honorable mention (2021), Alibaba Global Mathematics Competition
- 2020 • 2nd Prize, The East Coast Data Open by Citadel
- 2019 • Laplace medal given to Valedictorian of École Polytechnique, French Science Academia
- 2019 • Rivot medal for outstanding research at École Polytechnique, French Science Academia
- 2015 • Bronze medal, International Physics Olympiad (IPhO)
- 2014 • Bronze medal, International Mathematics Olympiad (IMO)
- 2014 • Silver medal, Junior Balkanic Mathematics Olympiad (JBMO)
- 2014 • 1st Prize, Concours Général in Mathematics, France

REVIEWING SERVICE

JOURNALS: Mathematics of Operations Research, INFORMS Journal on Optimization, Machine Learning

CONFERENCES: NeurIPS (2021-2023), ICML (2023), ICLR (2022), ALT (2023)

WORK AND RESEARCH EXPERIENCE

- 2020 **Amazon Inc.**, Research Intern, Cambridge, MA
- 2019 **University of California, Davis**, Research Assistant with Prof. Jesús A. De Loera, Davis, CA
- 2018 **INRIA**, Research Assistant with Prof. Laurent Massoulié, Paris, France
- 2017 **École Polytechnique**, Research Assistant with Prof. Gabriel Peyré, Palaiseau, France