Matheus Venturyne Xavier Ferreira

Personal Data — June 29, 2023

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Research Interests

Artificial Intelligence, Optimization, Algorithmic Economics, Security

Education

Princeton University — Princeton, NJ, USA
Doctor of Philosophy in Computer Science — 2022
Master of Arts in Computer Science — 2018
Thesis: *Economics and Computation in Decentralized Systems*
Advisor: S. Matthew Weinberg

Universidade Federal de Itajubá — Itabira, MG, Brazil
B.S. with Honors in Computer Engineering — 2016

University of California, San Diego — San Diego, CA, USA
Exchange student fully funded by a BSMP Fellowship — 2014

Work Experience

Harvard University — Boston, MA, USA
Postdoctoral Fellow in Computer Science — 2022 - Present
Fellow in Computer Science — Summer 2020

Broadcom Corporation — San Diego, CA, USA
Software Development Engineer Intern in Bluetooth/NFC — Summer 2014

Selected Honors and Awards

- Postdoctoral Fellowship Simons Laufer Mathematical Sciences Institute (**Declined**) 2023
- Highlights Beyond EC, 24th ACM Conference on Economics and Computation 2023
- Future Faculty Career Exploration Program, Rochester Institute of Technology 2022
- Spotlight Beyond WINE, The 17th Conference on Web and Internet Economics 2021
- SEAS Award for Excellence, Princeton School of Engineering and Applied Sciences 2020
- LATinE Fellow, Purdue University College of Engineering 2020
- CRA-WP Grad Cohort for URMD, Computing Research Association 2020
- Winning Presentation, Princeton Research Day, Princeton University 2020
- Dean's Grant, Princeton University Graduate School 2016 - 2021
- First Year Fellowship in Engineering, Princeton University 2016
- Congratulations from Higher Counsel, Universidade Federal de Itajubá 2016
- Motion of Applause, Municipal Chamber of Itabira 2016
- CNS Espresso Prize for Excellence in Networking, University of California, San Diego 2014
- Brazil Scientific Mobility Program, Federal Government of Brazil 2014
- 1^{st} place in 2nd Line Follower Robot Competition, Unifei **[Video]** 2013

PUBLICATIONS (AUTHORS IN ALPHABETICAL ORDER)

- Matheus V. X. Ferreira and David C. Parkes. Credible decentralized exchange design via verifiable sequencing rules. In *To appear at Proceedings of the 55th Annual ACM Symposium on Theory of Computing*, STOC '23, 2023
- Matheus V. X. Ferreira, Ye Lin Sally Hahn, S. Matthew Weinberg, and Catherine Yu. Optimal strategic mining against cryptographic self-selection in proof-of-stake. In *Proceedings of the 23rd ACM Conference on Economics and Computation*, EC '22, 2022
- Meryem Essaidi, Matheus V. X. Ferreira, and S. Matthew Weinberg. Credible, strategyproof, optimal, and bounded expected-round single-item auctions for all distributions. In *Proceedings of the 13th Innovations in Theoretical Computer Science Conference*, ITCS '22, 2022
- Matheus V. X. Ferreira, Daniel J. Moroz, David C. Parkes, and Mitchell Stern. Dynamic posted-price mechanisms for the blockchain transaction-fee market. In *Proceedings of the 3rd ACM Conference on Advances in Financial Technologies*, AFT '21, 2021
- Matheus V. X. Ferreira and S. Matthew Weinberg. Proof-of-stake mining games with perfect randomness. In *Proceedings of the 22nd ACM Conference on Economics and Computation*, EC '21, 2021
- Matheus V. X. Ferreira and S. Matthew Weinberg. Credible, truthful, and two-round (optimal) auctions via cryptographic commitments. In *Proceedings of the 21st ACM Conference on Economics and Computation*, EC '20, 2020
- Tithi Chattopadhyay, Nick Feamster, Matheus V. X. Ferreira, Danny Yuxing Huang, and S. Matthew Weinberg. Selling a single item with negative externalities. In *The World Wide Web Conference*, WWW '19, 2019

TEACHING

Princeton University - Teaching Assistant

Spring 2020	Junior Independent Work (COS 398)
Spring 2018	Economics and Computation (COS 445)
Fall 2017	Computation Geometry (COS 451)

Universidade Federal de Itajuba - Teaching Assistant

2015	Computer Security
2013	Objected-Oriented Programming (ECO 30)

SERVICE

2023

Poster Co-Chair. ACM EAAMO
Program Committee. Tokenomics
Program Committee. WINE
Program Committee. ACM Advances in Financial Technologies
Program Committee. MARBLE
Program Committee. ACM Economics and Computation (EC)
Program Committee. The Web Conference: Economics, Monetization, and Online Markets
Reviewer. Operations Research
Reviewer. Distributed Ledger Technologies
Reviewer. International Economic Review
Reviewer. Transactions on Economics and Computation

2022

Program Committee. Tokenomics
Program Committee. ACM Advances in Financial Technologies (AFT)
Program Committee. MARBLE
Reviewer. Transactions on Economics and Computation
External Reviewer. Symposium on Theory of Computing (STOC)
External Reviewer. ACM-SIAM Symposium on Discrete Algorithms (SODA)
External Reviewer. Innovations in Theoretical Computer Science (ITCS)

2021

Reviewer. Journal of Cryptoeconomic Systems
External Reviewer. ACM Economics and Computation (EC)
External Reviewer. USENIX Security

2020

Program Committee. Global Challenges in Economics and Computation
Reviewer. Journal of Cryptoeconomic Systems
Reviewer. Games and Economic Behavior
External Reviewer. ACM Advances in Financial Technologies (AFT)
External Reviewer. Innovations in Theoretical Computer Science (ITCS)
External Reviewer. Web and Internet Economics (WINE)

2019

External Reviewer. Innovations in Theoretical Computer Science (ITCS)
External Reviewer. Web and Internet Economics (WINE)

2018

External Reviewer. Web and Internet Economics (WINE)

UNDERGRADUATE STUDENTS MENTORING

- Hannah Huh. *Princeton University*. Now at Citadel — Feb-2022-May 2022
  Title: *Computing Optimal Strategies for Cryptographic Self-Selection Games*

- Anthony Hein. *Princeton University* — Sept 2021-May 2022
  Title: *Searching for Optimal Strategies in Proof-of-Stake Mining Games with Access to External Randomness*
  Outstanding Computer Science Senior Thesis Prize

- Michelle Woo. *Princeton University*. Now at Radix Trading LLC — Fall 2020-May 2021
  Title: *Computing optimal selfish mining strategies for Proof-of-Stake blockchains via MDPs*

- Catherine Yu. *Princeton University*. Now at Stripe — June 2020-May 2022
  Title: *Optimal Strategic Mining Against Cryptographic Self-Selection in Proof-of-Stake*
  Published at ACM EC 2022

- Tinashe Handina. *Princeton University*. Now Ph.D. student at Caltech — June 2020-May 2021
  Title: *A Random walk in Extensive Form Games: An Investigation into information, strategy-proofness and Credibility*

DIVERSITY, INCLUSION & OUTREACH

- Member, Computer Science Ad Hoc Committee, Princeton University 2021
- Panelist, CS Advisory Council: Grad student panel, Princeton Computer Science August 2021
- Panelist, Pathways to Graduate School, Princeton School of Engineering August 2021
- Panelist, Pathways to Graduate School, Princeton School of Engineering August 2020
- Panelist, Princeton Prospective PhD Preview (P3), Princeton Graduate School October 2020
- Mentor, Algorithmic Game Theory Mentoring Workshop (AMW), SIGecom 2020, 2021, 2022
- Peer Mentor, Graduate Scholars Program (GSP), Princeton University 2019, 2020, 2021
- Graduate student faculty hiring committee, Princeton Computer Science 2019
- LGBTQIA Peer Educator, Whitman College, Princeton University 2019, 2020
- Mentor, Princeton Summer Programming Experience, Princeton University 2017
- Mentor, Princeton Women in Computer Science, Princeton University 2016, 2017

TALKS

1. Quantitative Issues in Centralised and Decentralised Finance (SIAM Financial Mathematics)
   Philadelphia, PA, June 9, 2023
   Credible Decentralized Exchange Design via Verifiable Sequencing Rules
2. Eighth Marketplace Innovation Workshop
   May 22, 2023
   Credible, Optimal Auctions via Blockchains
3. De Gruyter digital event [Video]
   May 18, 2023
   Bitcoin: A game-theoretic analysis
4. Research Day at the Metrograph [Video]
   New York City, NY, May 16, 2023
   Credible Decentralized Exchange Design via Verifiable Sequencing Rules
5. Crypto and Blockchain Economics Research Forum (CBER) Symposium [Video]
   April 20, 2023
   Credible Decentralized Exchange Design via Verifiable Sequencing Rules
6. MIT, Algorithms and Complexity Seminar
   Cambridge, MA, April 19, 2023
   Credible Decentralized Exchange Design via Verifiable Sequencing Rules
7. Princeton University, Decenter Seminar
   Princeton, NJ, April 10-13, 2023
   Transparency and Security via Algorithmic Economics
8. University of Virginia, Department of Computer Science
   Charlottesville, VA, March 20-22, 2023
   Transparency and Security via Algorithmic Economics
9. Tufts University, Department of Computer Science
   Medford, MA, February 28 and March 1, 2023
   Transparency and Security via Algorithmic Economics
10. The University of Sydney, School of Computer Science
    Sydney, Australia, February 20, 2023
    Transparency and Security via Algorithmic Economics

11. Carnegie Mellon University, Crypto Seminar [Video]
Pittsburgh PA, February 16, 2023
Transparency and Security via Algorithmic Economics

12. 4th International Conference on Blockchain Economics Security and Protocols (Tokenomics)
Sorbonne Université, France, December 12-13, 2022
Credible Decentralized Exchange Design via Verifiable Sequencing Rules

13. Harvard University, EconCS Seminar
Boston, MA, November 4, 2022
Credible Decentralized Exchange Design via Verifiable Sequencing Rules

14. SIGecom Seminar Series Fall 2022
November 4, 2022
Optimal Strategic Mining Against Cryptographic Self-Selection in Proof-of-Stake

15. UC Berkeley, Crypto Economics Security Conference
Berkeley, CA, October 31-November 1, 2022
Credible Decentralized Exchange Design via Verifiable Sequencing Rules

16. INFORMS Annual Meeting
Indianapolis, IN, October 16-19, 2022
Optimal Strategic Mining Against Cryptographic Self-Selection in Proof-of-Stake

17. Rochester Institute of Technology (**Future Faculty Career Exploration Program**)
Rochester, NY, September 21-24, 2022
Economics and Computation in Distributed Systems

18. 23rd ACM Conference on Economics and Computation [Video]
University of Colorado, Boulder, CO, July 11-15, 2022
Optimal Strategic Mining Against Cryptographic Self-Selection in Proof-of-Stake

19. Ripple Labs, Crypto Monthly
June 21, 2022
Economics and Computation in Distributed Systems

20. Harvard University, Theory of Computation Seminar
Boston, February 11, 2022
Proof-of-Stake Mining Games with Perfect Randomness

21. The 17th Conference on Web and Internet Economics (**Spotlights Beyond WINE**) [Video]
December 15, 2021
Proof-of-Stake Mining Games with Perfect Randomness

22. 3rd ACM Conference on Advances in Financial Technologies [Video]
September 26-28, 2021
Dynamic Posted-Price Mechanisms for the Blockchain Transaction-fee market

23. 16th Workshop on the Economics of Networks, Systems and Computation
July 23, 2021
Dynamic Posted-Price Mechanisms for the Blockchain Transaction-fee market

24. 22nd ACM Conference on Economics and Computation [Video]
July 22, 2021
Proof-of-Stake Mining Games with Perfect Randomness

25. Princeton University, Research Day [Video]
Princeton, May 2021
Proof-of-Stake Mining Games with Perfect Randomness

26. Princeton University, Theory of Computation Day
Princeton, April 2021
Proof-of-Stake Mining Games with Perfect Randomness

27. Microsoft Research, Algorithms Group
Redmond, WA, March 10, 2021
Economics and Computation in Distributed Systems

28. INFORMS Annual Meeting
November 2020
Credible, Truthful, and Two-Round (Optimal) Auctions via Cryptographic Commitments

29. 21st ACM Conference on Economics and Computation [Video]
July 2020
Credible, Truthful, and Two-Round (Optimal) Auctions via Cryptographic Commitments

30. Princeton University, Research Day (**Winning Presentation**) [Video]
Princeton, NJ, May 5, 2020
Credible, Truthful, and Two-Round (Optimal) Auctions via Cryptographic Commitments

31. Princeton University, Theory of Computation Day
Princeton, NJ, June 2019
Credible, Truthful, and Two-Round (Optimal) Auctions via Cryptographic Commitments

32. Princeton University, Mechanism Design Seminar
Princeton, NJ, June 2017
Selling a Single Item with Negative Externalities: To Regulate Production or Payments?