

Matheus Venturyne Xavier Ferreira

PERSONAL DATA

NOVEMBER 22, 2024

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RESEARCH INTERESTS

Economics and Computation, Security, Blockchains, AI

EDUCATION

Princeton University Princeton, NJ, USA
Doctor of Philosophy in COMPUTER SCIENCE 2022
Master of Arts in COMPUTER SCIENCE 2018

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

PROFESSIONAL EXPERIENCE

University of Virginia Charlottesville, VA, USA
Assistant Professor of COMPUTER SCIENCE July 2024 - Present

TLDR: The latest in DeFi Research
Research Council Member 2023 - present

Harvard University Boston, MA, USA
Lecturer in COMPUTER SCIENCE Sept 2023 - December 2023
Postdoctoral Fellow in COMPUTER SCIENCE Sept 2021 - July 2024
Fellow in COMPUTER SCIENCE Summer 2020

Princeton University Princeton, NJ, USA
Ph.D. candidate in COMPUTER SCIENCE (advised by *S. Matthew Weinberg*) Sept 2016 - Dec 2021
Thesis: *Economics and Computation in Decentralized Systems*

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 (SLMath) 2023
(declined due to work visa restrictions)
- 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
- 1st place in 2nd Line Follower Robot Competition, Unifei [Video] 2013

PUBLICATIONS (AUTHORS IN ALPHABETICAL ORDER)

Google Scholar

- Matheus V. X. Ferreira, Aadityan Ganesh, Jack Hourigan, Hannah Huh, S Matthew Weinberg, and Catherine Yu. Computing optimal manipulations in cryptographic self-selection proof-of-stake protocols. In *Proceedings of the 25th ACM Conference on Economics and Computation, EC '24*, 2024
- Tarun Chitra, Matheus V. X. Ferreira, and Kshitij Kulkarni. Credible, Optimal Auctions via Public Broadcast. In Rainer Böhme and Lucianna Kiffer, editors, *6th Conference on Advances in Financial Technologies (AFT 2024)*, volume 316 of *Leibniz International Proceedings in Informatics (LIPIcs)*, pages 19:1–19:16, Dagstuhl, Germany, 2024. Schloss Dagstuhl – Leibniz-Zentrum für Informatik. ISBN 978-3-95977-345-4. doi: 10.4230/LIPIcs.AFT.2024.19. URL <https://drops.dagstuhl.de/entities/document/10.4230/LIPIcs.AFT.2024.19>
- Matheus V. X. Ferreira and David C. Parkes. Credible decentralized exchange design via verifiable sequencing rules. In *Proceedings of the 55th Annual ACM Symposium on Theory of Computing, STOC '23*, 2023. URL <https://arxiv.org/abs/2209.15569>
- 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. ISBN 9781450391504. doi: 10.1145/3490486.3538337. URL <https://arxiv.org/pdf/2207.07996.pdf>
- 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. doi: 10.4230/LIPIcs.ITCS.2022.66. URL <https://arxiv.org/pdf/2205.14758.pdf>
- 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. URL <https://arxiv.org/pdf/2103.14144.pdf>
- 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. ISBN 9781450379755. doi: 10.1145/3391403.3399495. URL <https://arxiv.org/pdf/2004.01598.pdf>
- 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. ISBN 9781450366748. doi: 10.1145/3308558.3313692. URL <https://arxiv.org/pdf/1902.10008.pdf>

PATENTS

- Matheus Venturyne Xavier Ferreira and David C. Parkes. Credible exchange design via a verifiable sequencing rule. PCT/US2024/035970, 2024. Pending

TEACHING

University of Virginia

Fall 2024 | Economics of Distributed Systems (CS 6501)

Harvard University - Co-Instructor

Fall 2023 | Economics and Computation (CS 136)

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)

2025

Co-Organizer. Oxford-Harvard Conference on Decentralised Finance and Market Microstructure
Program Committee. Financial Cryptography (FC)
External Reviewer. Innovations in Theoretical Computer Science (ITCS)
External Reviewer. Symposium on Theory of Computing (STOC)

2024

Reviewer. NSF Small Business Innovation Research/Small Business Technology Transfer
Co-Organizer. EC'24 Tutorial on Transaction Fee Mechanism Design
Program Committee. ACM Economics and Computation (EC)
Program Committee. Advances in Financial Technologies (AFT)
Program Committee. The 4th Workshop on Decentralized Finance (DeFi)
Reviewer. Finance and Stochastics
Reviewer. Games and Economics Behavior
External Reviewer. Innovations in Theoretical Computer Science (ITCS)
External Reviewer. Symposium on Theory of Computing (STOC)
External Reviewer. ACM-SIAM Symposium on Discrete Algorithms (SODA)
External Reviewer. ACM Symposium on Principles of Distributed Computing (PODC)

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
Reviewer. ACM-SIAM Symposium on Discrete Algorithms (SODA)
Reviewer. Journal of Cryptoeconomic Systems

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)

RESEARCH ADVISING

- Lars Lien Ankile. *Harvard University*. Now at MIT Summer '23 - May '24
Title: *I See You! Robust Measurement of Adversarial Behavior*
- Hannah Huh. *Princeton University*. Now at Citadel Spring '22 - May '22
Title: *Computing Optimal Strategies for Cryptographic Self-Selection Games*
- Anthony Hein. *Princeton University*. Now at Five Rings Fall '21 - May '22
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 '20 - May '21
Title: *Computing optimal selfish mining strategies for Proof-of-Stake blockchains via MDPs*
- Catherine Yu. *Princeton University*. Now at Stripe Summer '20 - May '22
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 Summer '20 - May '21
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 AND EVENTS

1. Double auctions for cross-blockchain resource allocation
EC '24 Workshop on Blockchains and Decentralized Finance. Yale School of Management
New Haven, CT. July 8, 2024
2. Credible Decentralized Exchange Design via Verifiable Sequencing Rules
Econ-DeFi Seminar. UC Santa Barbara.
Santa Barbara, CA. June 28, 2024
3. Dynamic Transaction Fee Mechanism Design
EC '24 Transaction Fee Mechanism Design Tutorial
June 25, 2024
4. I See You! Robust Measurement of Adversarial Behavior
Marketplace Innovation Workshop (MIW)
May 20, 2024

5. I See You! Robust Measurement of Adversarial Behavior
TLDR Conference. Columbia Business School
New York City. May 17, 2024
6. I See You! Robust Measurement of Adversarial Behavior
NSF/CEME Decentralization Conference. Vanderbilt University
Nashville, TN. April 19, 2024
7. I See You! Robust Measurement of Adversarial Behavior
Blockchain Lab. Stern School of Business. New York University
New York City, NY. April 12, 2024.
8. I Wasn't There: Applications of Blockchain to Privacy Preserving Reality Protection. **Facilitator**
Princeton Center for the Decentralization of Power Through Blockchain Technology (Decenter)
Princeton, NJ. December 04, 2023
9. Algorithm Design under the Credibility Lenses. **Quest Lecture**
Boston University Center for Computing and Data Sciences
Boston, MA. November 30, 2023
10. Credible Decentralized Exchange Design via Verifiable Sequencing Rules
Thalesians Seminar. International Association for Quantitative Finance
New York City, NY. October 03, 2023
11. Future of Decentralization, AI & Computing Summit. **Panelist**. UC Berkeley [Video]
Berkeley, CA, August 27, 2023
12. Algorithm Design under the Credibility Lenses. Blockchain + Economics workshop [Video]
August 15, 2023
13. Credible Decentralized Exchange Design via Verifiable Sequencing Rules [Video]
CryptoEconDay, CryptoEconLab
Paris, France, July 9, 2023
14. Credible Decentralized Exchange Design via Verifiable Sequencing Rules. **Highlights Beyond EC**
London, UK. June 23, 2023
15. Credible Decentralized Exchange Design via Verifiable Sequencing Rules. STOC 2023 [Video]
Orlando, FL, June 20-23, 2023
16. Credible Decentralized Exchange Design via Verifiable Sequencing Rules
MIT Media Lab, Digital Currency Initiative
Cambridge, MA. June 14, 2023
17. Credible Decentralized Exchange Design via Verifiable Sequencing Rules
Quantitative Issues in Centralised and Decentralised Finance (SIAM Financial Mathematics)
Philadelphia, PA, June 9, 2023
18. Eighth Marketplace Innovation Workshop
May 22, 2023
Credible, Optimal Auctions via Blockchains
19. De Gruyter Digital Event [Video]
May 18, 2023
Bitcoin: A game-theoretic analysis
20. Research Day at the Metrograph [Video]
New York City, NY, May 16, 2023
Credible Decentralized Exchange Design via Verifiable Sequencing Rules
21. Crypto and Blockchain Economics Research Forum (CBER) Symposium [Video]
April 20, 2023
Credible Decentralized Exchange Design via Verifiable Sequencing Rules
22. MIT, Algorithms and Complexity Seminar
Cambridge, MA, April 19, 2023
Credible Decentralized Exchange Design via Verifiable Sequencing Rules

23. Princeton University, Decenter Seminar
Princeton, NJ, April 10-13, 2023
Transparency and Security via Algorithmic Economics
24. University of Virginia, Department of Computer Science
Charlottesville, VA, March 20-22, 2023
Transparency and Security via Algorithmic Economics
25. Tufts University, Department of Computer Science
Medford, MA, February 28 and March 1, 2023
Transparency and Security via Algorithmic Economics
26. The University of Sydney, School of Computer Science
Sydney, Australia, February 20, 2023
Transparency and Security via Algorithmic Economics
27. Carnegie Mellon University, Crypto Seminar [Video]
Pittsburgh PA, February 16, 2023
Transparency and Security via Algorithmic Economics
28. 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
29. Harvard University, EconCS Seminar
Boston, MA, November 4, 2022
Credible Decentralized Exchange Design via Verifiable Sequencing Rules
30. SIGecom Seminar Series Fall 2022
November 4, 2022
Optimal Strategic Mining Against Cryptographic Self-Selection in Proof-of-Stake
31. UC Berkeley, Crypto Economics Security Conference
Berkeley, CA, October 31-November 1, 2022
Credible Decentralized Exchange Design via Verifiable Sequencing Rules
32. INFORMS Annual Meeting
Indianapolis, IN, October 16-19, 2022
Optimal Strategic Mining Against Cryptographic Self-Selection in Proof-of-Stake
33. Rochester Institute of Technology (**Future Faculty Career Exploration Program**)
Rochester, NY, September 21-24, 2022
Economics and Computation in Distributed Systems
34. 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
35. Ripple Labs, Crypto Monthly
June 21, 2022
Economics and Computation in Distributed Systems
36. Harvard University, Theory of Computation Seminar
Boston, February 11, 2022
Proof-of-Stake Mining Games with Perfect Randomness
37. The 17th Conference on Web and Internet Economics (**Spotlights Beyond WINE**) [Video]
December 15, 2021
Proof-of-Stake Mining Games with Perfect Randomness
38. 3rd ACM Conference on Advances in Financial Technologies [Video]
September 26-28, 2021
Dynamic Posted-Price Mechanisms for the Blockchain Transaction-fee market
39. 16th Workshop on the Economics of Networks, Systems and Computation
July 23, 2021
Dynamic Posted-Price Mechanisms for the Blockchain Transaction-fee market

- 40. 22nd ACM Conference on Economics and Computation [Video]
July 22, 2021
Proof-of-Stake Mining Games with Perfect Randomness
- 41. Princeton University, Research Day [Video]
Princeton, May 2021
Proof-of-Stake Mining Games with Perfect Randomness
- 42. Princeton University, Theory of Computation Day
Princeton, April 2021
Proof-of-Stake Mining Games with Perfect Randomness
- 43. Microsoft Research, Algorithms Group
Redmond, WA, March 10, 2021
Economics and Computation in Distributed Systems
- 44. INFORMS Annual Meeting
November 2020
Credible, Truthful, and Two-Round (Optimal) Auctions via Cryptographic Commitments
- 45. 21st ACM Conference on Economics and Computation [Video]
July 2020
Credible, Truthful, and Two-Round (Optimal) Auctions via Cryptographic Commitments
- 46. Princeton University, Research Day (**Winning Presentation**) [Video]
Princeton, NJ, May 5, 2020
Credible, Truthful, and Two-Round (Optimal) Auctions via Cryptographic Commitments
- 47. Princeton University, Theory of Computation Day
Princeton, NJ, June 2019
Credible, Truthful, and Two-Round (Optimal) Auctions via Cryptographic Commitments
- 48. Princeton University, Mechanism Design Seminar
Princeton, NJ, June 2017
Selling a Single Item with Negative Externalities: To Regulate Production or Payments?