Matheus Venturyne Xavier Ferreira

Personal Data

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Research Interests

Artificial Intelligence, Algorithmic Economics, Cryptography, 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

- 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
- 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
- 1^{st} place in 2nd Line Follower Robot Competition, Unifei **[Video]** — 2013

PUBLICATIONS (AUTHORS IN ALPHABETICAL ORDER)

- Tarun Chitra, Matheus V. X. Ferreira, and Kshitij Kulkarni. Credible, optimal auctions via blockchains. *In submission*, 2023
- Kshitij Kulkarni, Matheus V. X. Ferreira, and Tarun Chitra. Credibility and incentives in gradual dutch auctions. *In submission*, 2023
- 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

Program Committee.

ACM Economics and Computation (EC)	2023
The Web Conference: Economics, Monetization, and Online Markets (WWW)	2023
International Conference on Mathematical Research for Blockchain Economy (MARBLE)	2023
International Conference on Blockchain Economics, Security and Protocols (Tokenomics)	2022
Web and Internet Economics (WINE)	2022
ACM Advances in Financial Technologies (AFT)	2022
International Conference on Mathematical Research for Blockchain Economy (MARBLE)	2022
Global Challenges in Economics and Computation	2020

Journal Reviewer.

Distributed Ledger Technologies	2023
International Economic Review	2023
Transactions on Economics and Computation	2022
Journal of Cryptoeconomic Systems	2021
Games and Economic Behavior	2020

Journal of Cryptoeconomic Systems 2020

Conference External Reviewer.

Symposium on Theory of Computing (STOC) 2022
ACM-SIAM Symposium on Discrete Algorithms (SODA) 2022
ACM Economics and Computation (EC) 2021
USENIX Security 2021
ACM Advances in Financial Technologies (AFT) 2020
Innovations in Theoretical Computer Science (ITCS) 2019, 2020, 2022
Web and Internet Economics (WINE) 2018, 2019, 2020

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. CMU Crypto Seminar
   Carnegie Mellon University, February 16, 2023
   Transparency and Security via Algorithmic Economics
2. Tokenomics, 2022
   Sorbonne Université, France, December 12-13, 2022
   Credible Decentralized Exchange Design via Verifiable Sequencing Rules

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

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

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

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

7. **RIT's Future Faculty Career Exploration Program**
   Rochester, NY, September 21-24, 2022
   Economics and Computation in Distributed Systems

8. 23rd ACM Conference on Economics and Computation [Video]
   Boulder, CO, July 11-15, 2022
   Optimal Strategic Mining Against Cryptographic Self-Selection in Proof-of-Stake

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

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

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

12. 3rd ACM Conference on Advances in Financial Technologies [Video]
    September 26-28, 2021
    Dynamic Posted-Price Mechanisms for the Blockchain Transaction-fee market

13. 16th Workshop on the Economics of Networks, Systems and Computation
    July 23, 2021
    Dynamic Posted-Price Mechanisms for the Blockchain Transaction-fee market

14. 22nd ACM Conference on Economics and Computation [Video]
    July 22, 2021
    Proof-of-Stake Mining Games with Perfect Randomness

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

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

17. Microsoft Research, Algorithms Group
    Redmond, CA, March 10, 2021
    Economics and computation in Distributed Systems

18. René Carmona's Group
    Princeton University, March 2021
    Algorithms, game theory and blockchains

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

20. 21st ACM Conference on Economics and Computation [Video]
    July 2020
    Credible, Truthful, and Two-Round (Optimal) Auctions via Cryptographic Commitments

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

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

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

REFERENCES

Professor S. Matthew Weinberg
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Princeton, NJ 08544
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Harvard University
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