Matheus Venturyne Xavier Ferreira

Personal Data

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Address: 5.420 Science and Engineering Complex, 150 Western Ave, Boston, MA 02134
Email: matheus@seas.harvard.edu
Webpage: http://matheusvxf.github.io/

Research Interests

Market Design, Game Theory, 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 — 2021 - 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

- RIT's Future Faculty Career Exploration Program — 2022
- SEAS Award for Excellence, Princeton School of Engineering and Applied Sciences — 2020
- LATinE Fellow, Purdue University College of Engineering — 2020
- 2020 CRA-WP Grad Cohort for URMD, CRA — 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, Universidade Federal de Itajubá [Video] — 2013

PUBLICATIONS (AUTHORS IN ALPHABETICAL ORDER)

- Matheus V. X. Ferreira and David C. Parks. Credible decentralized exchange design via verifiable sequencing rules. In *Submission*, 2022
- 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, page 89–114, New York, NY, USA, 2022. Association for Computing Machinery
- Meryem Essaidi, Matheus V. X. Ferreira, and S. Matthew Weinberg. Credible, Strategyproof, Optimal, and Bounded Expected-Round Single-Item Auctions for All Distributions. In Mark Braverman, editor, *13th Innovations in Theoretical Computer Science Conference (ITCS 2022)*, volume 215 of *Leibniz International Proceedings in Informatics (LIPIcs)*, pages 66:1–66:19, Dagstuhl, Germany, 2022. Schloss Dagstuhl – Leibniz-Zentrum für Informatik
- 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, page 86–99, New York, NY, USA, 2021. Association for Computing Machinery
- 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, page 433–453, New York, NY, USA, 2021. Association for Computing Machinery
- 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, page 683–712, New York, NY, USA, 2020. Association for Computing Machinery
- 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, page 196–206, New York, NY, USA, 2019. Association for Computing Machinery

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.

The Web Conference: Economics, Monetization, and Online Markets Track (WWW)	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.

Journal of Cryptoeconomic Systems	2020, 2021
Games and Economic Behavior	2020

Conference 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

- 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*

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

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

- 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

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

Diversity, Inclusion & Outreach

- Member, Computer Science Ad Hoc Committee, Princeton University 2021
- Mentor, Algorithmic Game Theory Mentoring Workshop (AMW), SIGECOM 2020 - 2022
- Peer Mentor, Graduate Scholars Program, Princeton University 2019 - 2021
- Peer Educator, LGBTQIA Peer Ed Program, 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. **Fall 2022 SIGecom Seminar Series**
   November 4, 2022
   Optimal Strategic Mining Against Cryptographic Self-Selection in Proof-of-Stake

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

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

4. **23rd ACM Conference on Economics and Computation**
   Boulder, CO, July 11-15, 2022
   Optimal Strategic Mining Against Cryptographic Self-Selection in Proof-of-Stake

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

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

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

8. **3rd ACM Conference on Advances in Financial Technologies** [Video]
   September 26-28, 2021
   Dynamic Posted-Price Mechanisms for the Blockchain Transaction-fee market

9. **16th Workshop on the Economics of Networks, Systems and Computation**
   July 23, 2021
   Dynamic Posted-Price Mechanisms for the Blockchain Transaction-fee market

10. **22nd ACM Conference on Economics and Computation** [Video]
    July 2021
    Proof-of-Stake Mining Games with Perfect Randomness

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

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

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

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

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

16. **21st ACM Conference on Economics and Computation** [Video]
    July 2020
    Credible, Truthful, and Two-Round (Optimal) Auctions via Cryptographic Commitments

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

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

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