# Matheus Venturyne Xavier Ferreira

## Personal Data

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## Research Interests

Security, Applied Cryptography, Algorithmic Game Theory

## Education

**Princeton University**, NJ, USA
Ph.D in Computer Science — Sept 2016 - Dec 2021
Thesis: *Economics and Computation in Decentralized Systems*; advised by S. Matthew Weinberg

**University of California, San Diego**, CA, USA
Exchange student fully funded by a BSMP Fellowship *(GPA: 3.92/4.00)* — Jan 2014 - Dec 2014

**Universidade Federal de Itajubá**, Itabira, MG, Brazil
B.S. with Honors in Computer Engineering *(GPA: 93.3/100)* — Jan 2011 - July 2016

## Work Experience

**Harvard University**, Cambridge, MA, USA
Postdoctoral Fellow in Computer Science — Sept 2021 - Present
Research Assistant — June 2020 - Oct 2020

**Broadcom Corporation**, San Diego, CA, USA
Software Development Engineer Intern in Bluetooth/NFC — June 2014 - Sept 2014

## Selected Honors and Awards

- SEAS Award for Excellence, Princeton University — Dec 2020
- LATinE Fellow, Purdue University — July 2020
- Dean's Grant, Princeton University — 2016 - 2021
- First Year Fellowship in Engineering, Princeton University — Sept. 2016 - June 2017
- Congratulations from Higher Counsel, Universidade Federal de Itajubá — June 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

1. Meryem Essaidi, Matheus V. X. Ferreira, and S. Matthew Weinberg. Credible, Strategyproof, Optimal, and Bounded Expected-Round Single-Item Auctions for All Distributions. In *13th Innovations in Theoretical Computer Science Conference (ITCS 2022)*, pages 66:1–66:19, Dagstuhl, Germany, 2022. Schloss Dagstuhl – Leibniz-Zentrum für Informatik

2. 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, New York, NY, USA, 2021. Association for Computing Machinery

3. 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

4. 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, pages 683—-712, New York, NY, USA, 2020. Association for Computing Machinery

5. 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, pages 196—206, New York, NY, USA, 2019. Association for Computing Machinery

## Selected Talks

**Dynamic Posted-Price Mechanisms for the Blockchain Transaction fee market**

- 3rd ACM conference on Advances in Financial Technologies [Slides] — Sept 2021
- 16th Workshop on the Economics of Networks, Systems and Computation — July 2021

**Proof-of-Stake Mining Games with Perfect Randomness**

- Harvard Theory of Computation Seminar — Feb 2022
- Spotlights Beyond WINE, The 17th Conference on Web and Internet Economics — Dec 2021
- 22nd ACM Conference on Economics and Computation [Video] [Slides] — July 2021
- Princeton University Research Day [Video] — May 2021
- Princeton Theory of Computation Day — April 2021

**Economics and computation in decentralized systems**

- Microsoft Research, Algorithms Group, Redmond — Mar 2021

**Credible, Truthful, and Two-Round (Optimal) Auctions via Cryptographic Commitments**

- INFORMS Annual Meeting — Nov 2020
- 21st ACM conference on Economics and Computation [Video] — July 2020
- Princeton University Research Day, [Video] [Slides] — May 2020
- Lightning Talk and Poster, WINE 2019, Columbia University — Dec 2019
- Princeton Theory of Computation Day — June 2019

## Service

**Program Committee.** International Conference on Mathematical Research for Blockchain Economy (2022), Journal of Cryptoeconomic Systems (2020, 2021), Global Challenges in Economics and Computation (2020).

**Referee.** STOC (2022), SODA (2022), ACM EC (2021), USENIX Security Symposium (2021), Games and Economic Behavior (2020), AFT (2020), ITCS (2019, 2020), WINE (2018, 2019, 2020).

## Teaching

**Princeton University - Teaching Assistant**

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|---|---|
| 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**

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

## Undergraduate Students Mentoring

- Tinashe Handina. *Princeton University*, now Ph.D. student at Caltech — June 2020 – May 2021
  A Random walk in Extensive Form Games: An Investigation into information, strategy-proofness and Credibility.
- Catherine Yu. *Princeton University* — June 2020 – Present
  Incentives in the Algorand blockchain.
- Michelle Woo. *Princeton University* — Fall 2020 – Present
- Anthony Hein. *Princeton University* — Sept 2021 – Present

## Diversity, Inclusion & Outreach

- Mentor, Algorithmic Game Theory Mentoring Workshop (AMW), SIGECOM — 2020 - 2021
- Peer Mentor, Graduate Scholars Program, Princeton University — 2019 - 2021
- Peer Educator, LGBTQIA Peer Ed Program, Princeton University — 2019 - 2020
- Mentor, Princeton Summer Programming Experience, Princeton University — 2017
- Mentor, Princeton Women in Computer Science, Princeton University — 2016 - 2017

## Software

**Vein: Rivers of Blood** [Video]: A distributed, real-time, 3D, multiplayer survival race game of microorganisms in the human body using C++ and DirectX11. My contributions focused on physics simulation, artificial intelligence and developing the game engine.

**Caminhos Drummondianos** [Google Play]: Android app for a tour in the Drummond's Path in the city of Itabira, the only literary path in South America. Drummond is considered one of the greatest Brazilian poet of all times.

## Languages

Portuguese: Mothertongue
English: Fluent

## Computer Skills

Programming: Python, C/C++, Java, Matlab, OpenGL, SQL, JavaScript, OCaml, R, Perl
Others: Linux, Windows, Bash, GDB, Git, LaTeX