# Matheus Venturyne Xavier Ferreira

## Personal Data — September 15, 2021


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## Research Interests

Algorithms, Game Theory, Cryptography, Security

## Appointments

**Harvard University**, MA, USA
Postdoctoral Fellow in Computer Science — Starting Sept 2021

## Education

**Princeton University**, NJ, USA
Ph.D in Computer Science — Sept 2016 - Present
Committee: S. Matthew Weinberg (Chair), Arvind Narayanan, David Parkes, Mark Braverman, Ran Raz

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

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

## Select 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, Unifei Higher Counsel — June 2016
- Motion of Applause, Municipal Chamber of Itabira — 2016
- CNS Espresso Prize for Excellence in Networking, UC San Diego — 2014
- $1^{st}$ place in Line Follower Robot Competition, Unifei — 2013

## Publications

1. 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

2. 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

3. 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

4. Matheus V. X. Ferreira, S. Matthew Weinberg, Danny Yuxing Huang, Nick Feamster, and Tithi Chattopadhyay. 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

## Working Papers

1. Matheus V.X. Ferreira, Meryem Essaidi, and S. Matthew Weinberg. Credible, strategyproof, optimal, and bounded expected-round single-item auctions for all distributions
2. Catherine Yu, Sally Hahn, Matheus V. X. Ferreira, and S. Matthew Weinberg. Optimal cheating in algorand's proof-of-stake protocol
3. Tinashe Handina, Matheus V. X. Ferreira, and S. Matthew Weinberg. Credible non ascending single unit auction

## Service

Program Committee

- Cryptoeconomic Systems, 2020, 2021.
- Global Challenges in Economics and Computation, 2020.

Reviewing

- SODA, 2022.
- ACM EC, 2021.
- USENIX Security Symposium, 2021.
- Games and Economic Behavior, 2020.
- ACM Advances in Financial Technologies (AFT), 2020.
- Innovations of Theoretical Computer Science (ITCS), 2019, 2020.
- Conference on Web and Internet Economics (WINE), 2018, 2019, 2020.

## Talks

**Economics and computation in decentralized systems**

- Microsoft Research, Redmond, Slides — Mar 2021

**Algorithms, game theory and blockchains**

- Reading group at ORFE, Princeton University, Slides — Mar 2021

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

- 16th Workshop on the Economics of Networks, Systems and Computation — July 2021

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

- 22nd ACM Conference on Economics and Computation — July 2021
- Princeton Research Day, Princeton University — May 2021
- Theory day, Princeton University — April 2021
- Poster, Tapia Conference — Sept 2020
- Poster, CRA-WP, Austin, Texas — Mar 2020

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

- INFORMS Virtual 2020 Annual Meeting — Nov 2020
- Poster, LATinE, Purdue University — July 2020
- 21st ACM Conference on Economics and Computation — July 2020
- Princeton Research Day, Princeton University — May 2020

- Lightning Talk and Poster, WINE 2019, Columbia University — Dec 2019
- Theory of Computer Science Group, Princeton University — June 2019

**Selling a Single Item with Negative Externalities: To Regulate Production or Payments?**

- The Web Conference, San Francisco — May 2019
- Poster, 19th ACM EC 2018, Cornell University — June 2018

## 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*, starting a CS Ph.D. at Caltech — June 2020 – Present
  Combinatorial credible auctions.
- Catherine Yu. *Princeton University* — June 2020 – Present
  Incentives in the Algorand blockchain.

## Diversity, Inclusion & Outreach

- Mentor, Algorithmic Game Theory Mentoring Workshop (AMW), SIGECOM — 2020
- 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

## Research Experience

- Research Assistant, Harvard University, MA, USA — June - Sept 2020
  Supervisor: Professor David C. Parkes
- Research Assistant, Princeton University, NJ, USA — June 2017 - Present
  Supervisor: Professor S. Matthew Weinberg
- Research Assistant, Universidade Federal de Minas Gerais, MG, Brazil — Sept 2013 - Feb 2014
  Supervisor: Professor Fernando Afonso Santos
- Research Assistant, Universidade Federal de Itajuba, MG, Brazil — July 2011 - Feb 2013
  Supervisor: Professor Carlos Henrique da Silveira

## Industry Experience

- Broadcom Corporation at San Diego, CA, USA — June - Sept 2014
  *Software Development Engineer Intern in Bluetooth/NFC* (Supervisor: David Hughes)

## 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.

## 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