

# Ulysse Pavloff, PhD

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Specialization: Distributed Computing and Game Theory

pavloffulysse.com

PhD Thesis: "A Game-Theoretic Analysis of Blockchain Robustness"

## Education

- 2021–2024     **PhD in Computer Science**, CEA and University Paris-Saclay, France.  
- Research area: Distributed Computing and Game Theory. Developed models to analyze blockchain robustness and Ethereum's PoS protocol.  
- Thesis: "Game-Theoretic Analysis of Blockchain Robustness."  
- Advisors: Sara Tucci-Piergiovanni, Yackolley Amoussou-Guenou.
- 2019–2021     **Master's Degree in Computer Science**, Sorbonne University, France.  
Specialization in Game Theory and Artificial Intelligence.
- 2016–2019     **Two Bachelor's Degrees in Mathematics and Computer Science**, Sorbonne University, France.  
Selective Curriculum (Double Intensive Computer Science and Mathematics).

## Experience

- 2022–2023     **Blockchain and ZK Content Author**, Node Guardians.  
Authored comprehensive, in-depth technical content on zk-SNARKs and blockchain technologies. Simplified complex concepts, such as pseudo-randomness and zero-knowledge proofs, into interactive 'quests' that included an explanatory post followed by a quiz to evaluate comprehension. [473 quests started / 384 quests completed; reference: Hector Roussille.]
- Jan–Jun 2021     **Research Internship**, University Paris Dauphine, France.  
Supervised by Prof. Jérôme Lang and Prof. Tristan Cazenave. Developed and applied Monte Carlo Tree Search algorithms and Game Theory to analyze voting systems, leading to a scientific paper titled *Sequential Elimination Voting Games*.
- Summer 2019     **Data Scientist**, Wister, France.  
Leveraged deep learning models to optimize ad selection, improving user engagement and automating model updates.

## Publications

- Pavloff, U., Amoussou-Guenou, Y., & Tucci-Piergiovanni, S., Ethereum Proof-of-Stake and the Probabilistic Bouncing Attack, - recently accepted for - ACM Distributed Ledger Technologies journal.
- Pavloff, U., Amoussou-Guenou, Y., & Tucci-Piergiovanni, S. (2024). Incentive Compatibility of Ethereum's PoS Consensus Protocol. *28th International Conference on Principles of Distributed Systems (OPODIS 2024)*.
- Pavloff, U., Amoussou-Guenou, Y., & Tucci-Piergiovanni, S. (2024). Byzantine Attacks Exploiting Penalties in Ethereum PoS. *54th IEEE/IFIP DSN 2024, Brisbane, Australia*.

- Pavloff, U., Amoussou-Guenou, Y., & Tucci-Piergiovanni, S. (2023). Ethereum Proof-of-Stake under Scrutiny. *38th ACM/SIGAPP Symposium on Applied Computing*. [Cited 30 times]
- Attiya, H., Del Pozzo, A., Milani, A., Pavloff, U., & Rapetti, A. (2023). The Synchronization Power of Auditable Registers. *27th OPODIS 2023*.
- Pavloff, U., Amoussou-Guenou, Y., & Tucci-Piergiovanni, S., Exploitation des amendes dans Ethereum PoS. AlgoTel 2024– Rencontres sur les Aspects Algorithmiques des Télécommunications.
- Pavloff, U., Cazenave, T., & Lang, J. (2022). Sequential Elimination Voting Games. *arXiv preprint*.

## Manuscript

U. Pavloff, A Game-Theoretic Approach to the Study of Blockchain's Robustness.

## Teaching

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| Spring 2023 | <b>Guest Lecturer</b> at École Polytechnique with Prof. Julien Prat. Delivered specialized lectures on Ethereum consensus mechanisms and their role in blockchain scalability and security.          |
| 2022–2023   | <b>Teaching Assistant</b> at HEC with Prof. Bruno Biais. Delivered lectures and guided discussions on Ethereum consensus mechanisms, emphasizing their application in decentralized finance.         |
| 2022–2023   | <b>Teaching Assistant</b> , ENSIIE. Conducted hands-on courses on Solidity programming and smart contracts, preparing students for practical blockchain development.                                 |
| 2021–2022   | <b>Teaching Assistant</b> at IUT Paris-Orsay. Designed and taught an introductory course on coding fundamentals, covering Git, Agile methodologies, and best practices for development organization. |

## Technical Skills

C, C++, C#, CSS, Git, HTML, Java, JavaScript,  $\text{\LaTeX}$ , Matlab, Python, Solidity, SQL.

## Projects

- **HCI Research Experiment.** Implementation of a web application to make a statistical analysis of a cognitive bias within the framework of a project on Human-Computer Interaction. Supervised by Gilles Bailly.
- **Data Challenge SFDS 2018.** Forecasted electricity consumption using mathematical models (ARMA) and machine learning techniques (neural networks). Supervised by Taieb Touati.
- **Behavioral Evolution Simulation.** Simulated behavioral specialization in embodied evolutionary robotics, based on a scientific paper. Supervised by Prof. Nicolas Bredeche.
- **WhatsUrvivor.** Developed a game over three months featuring weekly challenges, ranging from engaging riddles to interactive games implemented in JavaScript.
- **Serious Game.** Developed an educational game in C# using Unity.
- **Adaptive Game.** Created a mobile game in C# with dynamic difficulty that adjusts to the user's skill level.
- **Lemmings.** Remade and enhanced the classic game in Java, improving mechanics and functionality.
- **Booking Website.** Designed and developed a booking website from scratch, increasing renting visibility and accessibility.

## Conference and Seminar Talks

Nov. 2024	A Game-Theoretic Analysis of Blockchain Robustness, PhD Defense, Palaiseau, France.
Aug. 2024	Byzantine Attacks Exploiting Penalties in Ethereum PoS, DSN, Brisbane, Australia.
Jun. 2024	Invited to Attend, Summer School on real-world crypto and privacy 2024, Vodice, Croatia.
May 2024	Exploitation des amendes dans Ethereum PoS, Algotel, St-Briac, France.
Feb. 2024	Ethereum Proof-of-Stake and the Probabilistic Bouncing Attack, Invited Speaker, Apéro Défi, Paris, France.
Mar. 2023	Ethereum Proof-of-Stake under Scrutiny, SAC, Talinn, Estonia.
Jun. 2023	Introction to ZK-SNARKs, Invited Speaker, Blockchain Bytes, Palaiseau, France
Feb. 2023	Ethereum Proof-of-Stake Under Scrutiny, Invited Speaker, Blockchain@X, Paris, France
Mar. 2022	Ethereum Consensus Protocol, Invited Speaker, Blockchain Bytes, Palaiseau, France

## Languages

<b>French</b>	Native Speaker
<b>English</b>	Near Native
<b>German</b>	Student Level

## Interests

Cinema (avid attendee with a yearly subscription), Chess (1900 Elo on Lichess), Reading (one book a month), Street Workout, and Running (recently started).