

Ulysse Pavloff, PhD

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Specialization: Distributed Computing and Game Theory

pavloffulysse.com

PhD Thesis: "A Game-Theoretic Approach to the Study of Blockchain's 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: "A Game-Theoretic Approach to the Study of Blockchain's 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, Ulysse, Yackolley Amoussou-Guenou, and Sara Tucci-Piergiovanni. "Ethereum Proof-of-Stake and the Probabilistic Bouncing Attack." Recently accepted. *ACM Distributed Ledger Technologies Journal*.
- Pavloff, Ulysse, Yackolley Amoussou-Guenou, and Sara Tucci-Piergiovanni. "Incentive Compatibility of Ethereum's PoS Consensus Protocol." *28th International Conference on Principles of Distributed Systems (OPODIS 2024)*, 2024.
- Pavloff, Ulysse, Yackolley Amoussou-Guenou, and Sara Tucci-Piergiovanni. "Byzantine Attacks Exploiting Penalties in Ethereum PoS." *54th IEEE/IFIP DSN 2024, Brisbane, Australia*, 2024.

- Pavloff, Ulysse, Yackolley Amoussou-Guenou, and Sara Tucci-Piergiovanni. "Ethereum Proof-of-Stake under Scrutiny." *38th ACM/SIGAPP Symposium on Applied Computing*, 2023. [Cited 30 times].
- Attiya, Hagit, Alessia Del Pozzo, Alessia Milani, Ulysse Pavloff, and Alberto Rapetti. "The Synchronization Power of Auditable Registers." *27th OPODIS 2023*, 2023.
- Pavloff, Ulysse, Yackolley Amoussou-Guenou, and Sara Tucci-Piergiovanni. "Exploitation des amendes dans Ethereum PoS." *AlgoTel 2024 – Rencontres sur les Aspects Algorithmiques des Télécommunications*, 2024.
- Pavloff, Ulysse, Tristan Cazenave, and Jérôme Lang. "Sequential Elimination Voting Games." *arXiv preprint*, 2022.

Manuscript

Pavloff, Ulysse. "A Game-Theoretic Approach to the Study of Blockchain's Robustness". 2024.

Teaching

Spring 2023	Guest Lecturer at École Polytechnique with Prof. Julien Prat. Delivered specialized lectures on Ethereum consensus mechanisms and their role in blockchain scalability and security.
2022–2023	Teaching Assistant at HEC with Prof. Bruno Biais. Delivered lectures and guided discussions on Ethereum consensus mechanisms, emphasizing their application in decentralized finance.
2022–2023	Teaching Assistant , ENSIIE. Conducted hands-on courses on Solidity programming and smart contracts, preparing students for practical blockchain development.
2021–2022	Teaching Assistant 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, \LaTeX , Matlab, Python, Solidity, SQL.

Projects

- **HCI Research Experiment.** Designed and implemented a web application to analyze cognitive biases as part of a Human-Computer Interaction project. Supervised by Gilles Bailly.
- **Data Challenge SFDS 2018.** Predicted electricity consumption using mathematical models (ARMA) and 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 an engaging three-month game featuring weekly challenges, ranging from riddles to interactive games built with JavaScript.
- **Serious Game.** Created an educational game in C# using Unity, designed to teach coding to young students.
- **Adaptive Game.** Designed a mobile game in C# with dynamic difficulty that adjusts to user skill levels, enhancing player engagement.
- **Lemmings Remake.** Remade and enhanced the classic game in Java, improving mechanics and introducing new functionalities.

- **Booking Website.** Designed and developed a booking platform, increasing rental visibility and accessibility for users.

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	Introduction 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

French	Native Speaker
English	Near Native
German	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).