Nerla Jean-Louis

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Education

University of Illinois Urbana-Champaign — Ph.D., Computer Science, Aug 2019–Dec 2026

Dissertation: *TEE and Blockchain Codesigns in a Decentralized Landscape*. Advisor: Andrew Miller. Defended Nov 3, 2026; degree expected Dec 2026.

Cornell University — B.S., Computer Science and Biological Engineering (double major), May 2017

Peer-Reviewed Publications

1. K. Babel, **N. Jean-Louis**, Y. Ji, U. Misra, M. Kelkar, K. Yapa Mudiyanselage, A. Miller, A. Juels. "PROF: Protected Order Flow in a Profit-Seeking World." *2026 IEEE 11th European Symposium on Security and Privacy (EuroS&P)*, Lisbon, Portugal, 2026, pp. 398–418. doi: 10.1109/EuroSP68448.2026.00034
2. **N. Jean-Louis**, Y. Li, Y. Ji, H. Malvai, T. Yurek, S. Bellemare, A. Miller. "SGXonerated: Finding (and Partially Fixing) Privacy Flaws in TEE-based Smart Contract Platforms Without Breaking the TEE." *Proceedings on Privacy Enhancing Technologies (PoPETs)*, 2024(1), pp. 617–634. Earlier version presented at the Science of Blockchain Conference (SBC) 2023.
3. D. Maram, H. Malvai, F. Zhang, **N. Jean-Louis**, A. Frolov, T. Kell, T. Lobban, C. Moy, A. Juels, A. Miller. "CanDID: Can-Do Decentralized Identity with Legacy Compatibility, Sybil-Resistance, and Accountability." *2021 IEEE Symposium on Security and Privacy (S&P)*, 2021, pp. 1348–1366.
4. S. Sinha, T. Astigarraga, R. B. Hull, **N. Jean-Louis**, V. C. Sreedhar, H. Chen, L. Hu, F. E. Carpi, J. A. Brusco Cannata, W. Loach. "Auto-Generation of Domain-Specific Systems: Cloud-Hosted DevOps for Business Users." *2020 IEEE 13th International Conference on Cloud Computing (CLOUD)*, 2020, pp. 219–228.
5. H. Kang, T. Dai, **N. Jean-Louis**, S. Tao, X. Gu. "FabZK: Supporting Privacy-Preserving, Auditable Smart Contracts in Hyperledger Fabric." *2019 49th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN)*, 2019, pp. 543–555.

Preprints

- M. Kelkar, Y. Li, **N. Jean-Louis**, C. Ortega Pérez, K. Babel, A. Miller, A. Juels. "The Sting Framework: Proving the Existence of Superclass Adversaries." IACR ePrint 2024/1676, 2024.
- C. Adam, A. Adebayo, H. Franke, E. C. Snible, T. Feldman-Fitzthum, J. Cadden, **N. Jean-Louis**. "Partially Trusting the Service Mesh Control Plane." arXiv:2210.12610, 2022.

Other writing: "TEE Rollups: Fixing Access Patterns in TEE-based Smart Contracts with Off-chain Computing." Medium, 2023.

Work Experience

Research Engineer, Inco Network — May 2024–Sep 2026

Designed the TEE lifecycle for Inco Lightning, a TEE-based confidential computing layer for smart contracts: bootstrapping the network, securely updating TEE nodes, and storing the network's secret keys. The design is used for the Lightning mainnet launch.

Research Assistant, University of Illinois Urbana-Champaign — Spring 2019–Dec 2025

Advisor: Andrew Miller. Developed frameworks for secure applications using trusted execution environments such as Intel SGX.

Teaching Assistant, Intro to Computer Science, University of Illinois Urbana-Champaign — Fall 2019

Led discussion sections and held office hours. Instructor: Geoffrey Challen.

Research Intern, IBM Research — Summer 2021

Verifiable configuration for the Zero Trust security model using TEE-based Istio containers.

Research Intern, IBM Research — Summer 2020

Scheduling and deployment of hybrid and multi-cloud microservice workloads that meet security and compliance standards while reducing cost.

Research Supplemental Employee, Hybrid Cloud, IBM Research — Sep 2017–Aug 2019

Template-based deployment generation, automation, and optimization for cloud services and applications.

Research Intern, IBM Research — Summer 2017

Byzantine fault-tolerant protocols for the Hyperledger Fabric blockchain platform.

Patents

- "Trusted Execution Environment for Service Mesh." U.S. Patent 12,413,557, issued Sep 9, 2025.
- "Compliance Aware Application Scheduling." U.S. Patent 11,954,524, issued Apr 9, 2024.
- "Model-Based Differencing to Selectively Generate and Deploy Images in a Target Computing Environment." U.S. Patent 11,288,055, issued Mar 29, 2022.
- "Service Management for the Infrastructure of Blockchain Networks." U.S. Patent 10,873,625, issued Dec 22, 2020.

Awards

- 1st Place, Initiative for Cryptocurrencies and Contracts (IC3) Blockchain Camp Hackathon, 2023
- 2nd Place, IC3 Blockchain Camp Hackathon, 2022, for MedTrace
- NSF Graduate Research Fellowship Program, Honorable Mention, 2021
- IBM Research Accomplishment, 2018

Service and Outreach

- Member, UIUC Computer Science Graduate Student Organization (CSGSO), 2021–2022
- Mentor, Sloan University Center of Exemplary Mentoring at Illinois, 2020–2021
- CS Grad Ambassador, Accepted Students Visit Days, 2020 and 2021
- Hackathon mentor: Code ADA 2020; HackIllinois HackThis 2020
- K–12 outreach: Pathways in Technology Early College High School IBM Research visit, 2019; National Engineers Week, Anne Dorner Middle School, 2018–2019