

Sam A. Markelon

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smarky7cd.github.io

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Research Interests

Cryptography, Privacy-Preserving Systems, Data Structures, Probability in Computing, and Randomized Algorithms.

Current Appointment

Aug 2025–	Proof Trading (New York, NY) Quantitative Researcher
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Education

2020–2025	PhD in Computer Science, University of Florida Florida Institute for Cybersecurity Research Advisor: Dr. Vincent Bindschaedler and Dr. Thomas Shrimpton
2016–2020	BS in Computer Science, University of Connecticut Minor in Mathematics Summa Cum Laude Honors Scholar Upsilon Pi Epsilon

Professional Experience

Summer 2023	NCC Group (New York, NY) Cryptography Services Intern
Summer 2019	NCC Group (New York, NY) Cryptography Services Intern
Summer 2018	Institut de Physique Nucléaire d'Orsay (Orsay, France) Scientific Computing Intern
Summer 2017	Jefferson National Laboratory (Newport News, VA) Software Engineering Intern

Technical Skills

- **Programming:** C/C++, Python, Go, Rust, Erlang, Julia
- **Tools:** Git, \LaTeX , Linux, LLMs
- **Frameworks:** NumPy, SciPy, Pandas, TensorFlow
- **Mathematics:** Probability Theory, Category Theory, Number Theory, Abstract Algebra

Publications

Various author ordering conventions used.

Journal and Conference Papers

- Filić, Mia, Jonas Hofmann, Sam A Markelon, Kenneth G Paterson, and Anupama Unnikrishnan (2025). “**Probabilistic Data Structures in the Wild: A Security Analysis of Redis**”. In: *Proceedings of the Fifteenth ACM Conference on Data and Application Security and Privacy*. **Best Paper Award**. Pp. 167–178.
- Bauer, Luke A., James K. Howes IV, **Sam A. Markelon**, Vincent Bindschaedler, and Thomas Shrimpton (2024). “**Covert Message Passing over Public Internet Platforms Using Model-Based Format-Transforming Encryption**”. In: *Proceedings of the 2024 ACM Conference on Data and Application Security and Privacy*. Porto, Portugal: Association for Computing Machinery.
- Markelon, Sam A., Mia Filić, and Thomas Shrimpton (2023). “**Compact Frequency Estimators in Adversarial Environments**”. In: *Proceedings of the 2023 ACM SIGSAC Conference on Computer and Communications Security*. CCS ’23. Copenhagen, Denmark: Association for Computing Machinery. ISBN: 979840070050. DOI: 10.1145/3576915.3623216. URL: 10.1145/3576915.3623216.
- Markelon, Sam A. and John True (2022). “**The DecCert PKI: A Solution to Decentralized Identity Attestation and Zooko’s Triangle**”. In: *2022 IEEE International Conference on Decentralized Applications and Infrastructures (DAPPS)*. **Best Paper Award**. Pp. 74–82. DOI: 10.1109/DAPPS55202.2022.00017.
- Krawec, Walter O. and Sam A. Markelon (2020). “**A semi-quantum extended B92 protocol and its analysis**”. In: *Quantum Information Science, Sensing, and Computation XII*. Ed. by Eric Donkor and Michael Hayduk. Vol. 11391. International Society for Optics and Photonics. SPIE, 113910G. DOI: 10.1117/12.2558200. URL: <https://doi.org/10.1117/12.2558200>.
- (2018). “**Genetic Algorithm to Study Practical Quantum Adversaries**”. In: *Proceedings of the Genetic and Evolutionary Computation Conference*. GECCO ’18. Kyoto, Japan: Association for Computing Machinery, pp. 1270–1277. ISBN: 9781450356183. DOI: 10.1145/3205455.3205478. URL: <https://doi.org/10.1145/3205455.3205478>.
- Krawec, Walter O. and Sam A. Markelon (2019). “**Discovery of Robust Protocols for Secure Quantum Cryptography**”. In: *Proceedings of the Genetic and Evolutionary Computation Conference Companion*. GECCO ’19. Prague, Czech Republic: Association for Computing Machinery, pp. 379–380. ISBN: 9781450367486. DOI: 10.1145/3319619.3321945. URL: <https://doi.org/10.1145/3319619.3321945>.

Posters and Poster Papers

Markelon, Sam A. (2017). “**gemcWeb: A Cloud Based Nuclear Physics Simulation Software**”. In: *Bulletin of the American Physical Society*. URL: <https://api.semanticscholar.org/CorpusID:66976789>.

Preprints

Brandt, Nicholas, Mia Filić, and Sam A. Markelon (2024). “**SoK: On the Security Goals of Key Transparency Systems**”. In: URL: <https://eprint.iacr.org/2024/1938>.

Awards and Grants

2024	CROSSING Travel Grant Academic Guest for November 2024 with Prof. Marc Fischlin’s Cryptoplexity Group at TU Darmstadt.
2023	ThinkSwiss Research Scholarship Academic Guest for Fall 2023 with Prof. Kenneth Paterson’s Applied Cryptography Group at ETH Zürich. Gartner Group Graduate Fellowship
2020	University of Florida Graduate School Preeminence Award
2019	Barry M. Goldwater Scholarship
2018	University of Connecticut IDEA Grant NTRUEncrypt implementation and usage research.
2016	University of Connecticut STEM Scholar

Teaching Experience

As teaching assistant at the University of Florida.

Spring 2025	COP 3530: Data Structures and Algorithms
Fall 2024	CIS 6930: Randomized Algorithms and Probability in Computing

As undergraduate teaching assistant at the University of Connecticut.

Spring 2020	CSE 3400: Introduction to Computer and Network Security
Fall 2019	
Spring 2019	CSE 3150: C++ Essentials
Fall 2018	CSE 2050: Data Structures and Object Oriented Programming