Sam A. Markelon

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smarky7cd.github.io

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Research Interests

Quantitative Finance, Cryptography, Data Structures, Probability in Computing, and Randomized Algorithms.

Current Appointment

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

Education

2020–2025 **PhD in Computer Science, University of Florida**
Florida Institute for Cybersecurity Research
Thesis: *Data Structures in Adversarial Environments*
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
- **Frameworks:** NumPy, SciPy, Pandas, TensorFlow
- **Mathematics:** Probability Theory, Applied Statistics, Category Theory

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.

Fischlin, Marc, Moritz Huppert, Jonas Hofmann, and Sam A Markelon (2025). "**Probabilistic Skipping-Based Data Structures with Robust Efficiency Guarantees**". In: *Proceedings of the 2025 ACM SIGSAC Conference on Computer and Communications Security*, pp. 1127–1141.

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.

Posters and Poster Papers

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.

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 (2025). "**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 Fall 2019	**CSE 3400: Introduction to Computer and Network Security**
Spring 2019	**CSE 3150: C++ Essentials**
Fall 2018	**CSE 2050: Data Structures and Object Oriented Programming**