

# Sam A. Markelon

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smarky7cd.github.io

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## 1 Research Interests

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

## Current Appointment

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| Aug 2025– | <b>Proof Trading (New York, NY)</b><br>Quantitative Researcher |
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## Education

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

## Professional Experience

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

## Technical Skills

- **Programming:** C/C++, Python, Go, Rust, Erlang, Julia
- **Tools:** Git,  $\text{\LaTeX}$ , 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

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

## Teaching Experience

As teaching assistant at the University of Florida.

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| Spring 2025 | <b>COP 3530: Data Structures and Algorithms</b>                     |
| Fall 2024   | <b>CIS 6930: Randomized Algorithms and Probability in Computing</b> |

As undergraduate teaching assistant at the University of Connecticut.

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