

# Julia Guskind

<https://github.com/Julia-Guskind> | <https://www.linkedin.com/in/julia-guskind> | [julia \[dot\] guskind \[at\] uconn.edu](mailto:julia.guskind@uconn.edu)

## EDUCATION

---

### University of Connecticut

Aug. 2019 - Expected May 2023

- B.S. in Computer Science, Mathematics Minor
- GPA: 4.0/4.0
- **Relevant Courses:** Discrete Math, Linear Algebra, Differential Equations, Algorithms and Complexity, Introduction to Computer and Network Security, Abstract Algebra (current)
- **Graduate Courses:** Introduction to Modern Cryptography, Computer Security, Blockchain Technology (current)

## RESEARCH PROJECTS

---

### Non-Malleable Point Obfuscations, *University of Connecticut*

Sept. 2022 - Present

Undergraduate research assistant for Professor Benjamin Fuller on construction of repeatable, non-malleable point obfuscations

### Lower Bound for Linear Garbling Schemes, *IBM*

July 2022 - Present

In collaboration with IBM Research; working with Charanjit Jutla (PhD), Nathan Manohar (PhD), and Akash Shah (PhD student, UCLA) to prove a lower bound for linear garbling schemes of boolean circuits with fan-out at least 2

### Selfish Mining for Rewardless Proof-of-Work, *University of Connecticut*

Sept. 2022 - Present

Working with a peer on independently researched term paper for graduate Blockchain Technology course; implementation-based analysis of selfish mining in rewardless setting for proof-of-work cryptocurrencies

### Semi-Quantum Random Number Generator, *University of Connecticut*

Jan. 2022 - Present

Working with Professor Walter Krawec on designing an information-theoretically secure semi-quantum random number generator; pre-print available online at <https://arxiv.org/pdf/2210.16427.pdf>

### Mediated Semi-Quantum Key Distribution, *University of Connecticut*

Sept. 2020 - April 2022

Worked with Professor Walter Krawec on the design and proof of security for new mediated semi-quantum key distribution protocol; appears in *Quantum Science and Technology* journal

## PUBLICATIONS AND ACKNOWLEDGEMENTS

---

Guskind, Julia, and Walter O Krawec. “Mediated semi-quantum key distribution with improved efficiency.” *Quantum Science and Technology* 7, no. 3 (2022): 035019. <https://iopscience.iop.org/article/10.1088/2058-9565/ac7412>.

Parker, Adam E. “Wronskians and Linear Independence: A Theorem Misunderstood by Many,” 2020.

Recognized in “Acknowledgement” section alongside Professor Hanson Smith for revision of a task due to underestimated complexity of computing Wronskians of matrices.

## INDUSTRY EXPERIENCE

---

### **Back-End Software Developer, IBM**

May 2022 - Aug. 2022

- Developed software for z/OS cryptographic security features to provide support for NIST FIPS 140-3 compliance using PL/X and Rexx programming languages

### **Cyber Resiliency Intern, The MITRE Corporation**

May 2021 - June 2022

- Wrote Python to assist development of a proof of concept for a new cryptographic architecture; demonstrated secure client/server communications in Python with OpenSSL
- Assessed the threat detection capabilities of a data collection tool using a multi-node environment in AWS, Windows Active Directory, and CALDERA (MITRE-developed automated pen-testing tool)
- Edited and helped write technical papers to provide insight on and improvements to current cryptographic key management techniques in the US Army and Air Force
- Continued work part-time during academic semester

### **Cyber Resiliency Intern (Remote), The MITRE Corporation**

May 2020 - Aug. 2020

- Performed literature search of 30+ papers on NIST's post-quantum cryptographic algorithms to assess the opinions of the academic community and provide insight on attack trends; delivered presentation to audience of 20+ members
- Used Python and Docker to assist in development of embedded systems pen-testing tool and optimize process for experimental testing
- Used C/C++ to develop proofs of concept leveraging features of Intel's Software Guard Extensions to validate security claims of trusted execution environments

## TECHNICAL SKILLS

---

<b>Programming</b>	Python, C, Scheme, PL/X (IBM mainframe OS language)
<b>Web Development</b>	Gatsby.js, React, Node.js, GraphQL
<b>Data Visualization</b>	Elastic Stack (Elasticsearch, Kibana, Beats, Elastic Security)
<b>Cloud</b>	AWS
<b>Systems Administration</b>	Microsoft Windows Active Directory

## EXTRACURRICULARS

---

### **Undergraduate Teaching Assistant, University of Connecticut**

- **Introduction to Computer and Network Security** Aug. 2022 - Present  
Host office hours and grade homework assignments
- **Introduction to Computing for Engineers** Aug. 2021 - Dec. 2021  
Helped teach introductory Python to 35+ students; hosted lab sessions and office hours; presented at exam review session to over 150 students

### **Secretary of UConn Math Club**

Aug. 2021 - Present

### **Math Tutor, University of Connecticut Quantitative Learning Center**

Sept. 2020 - May 2021

- Calculus I & II, Multivariable Calculus, Statistics