Fatima Farooq

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EDUCATION

New York University Abu Dhabi — **Abu Dhabi, UAE**

- *Bachelor of Science in Computer Engineering* — *May 2025*
- Relevant Coursework: Machine Learning, Hardware Security, Embedded Systems, Computer Architecture & Organization, Advanced Digital Logic, Electronics, Very Large-Scale Integrated Circuits, Computer Security, Operating Systems, Data Structures & Algorithms, Computer Networks, Object-Oriented Programming, Communications Lab, Data Bootcamp

WORK EXPERIENCE

NYU Center for Cybersecurity — **New York, United States**

Research Assistant — *June 2024-Present*

- Conducted comprehensive literature reviews on current benchmarks and LLM models for RTL generation
- Developed 10 distinct Python and API-based prompt engineering frameworks for Verilog RTL generation
- Curated a categorized dataset of 168 Verilog problems to facilitate targeted analysis and testing
- Currently evaluating the effectiveness of these frameworks on the dataset, with findings to be submitted to the LAD'25 conference

NYUAD Engineering Department — **Abu Dhabi, UAE**

Teaching Assistant — *August 2022-December 2024*

- Lead weekly office hours to assist over 100 students, explaining complex programming concepts, debugging code, and addressing programming misconceptions in the *Computer Programming for Engineers* course.
- Supervise weekly lab sessions to guide students in enhancing code efficiency
- Evaluate and grade weekly programming quizzes for a class of over 100 students

NYU Tandon CSE Department — **New York, United States**

Teaching Assistant — *January 2024-May 2024*

- Led *Computer Architecture and Organization* recitations, elucidating key concepts such as CPU design, memory hierarchy, instruction sets, and data paths to enhance student understanding
- Corrected and debugged comprehensive 50+ C++, Verilog, Python processor simulation programs biweekly, ensuring accuracy and functionality in student projects

Design for Excellence Lab — **Abu Dhabi, UAE**

Research Assistant — *June 2023-August 2023*

- Successfully implemented the UNSAIL technique to counteract oracle-less, machine learning-based attacks on logic locking, enhancing security against advanced ML models like SAIL
- Developed and engineered C++ scripts for random logic locking and specific key-gate encoding, manipulating gate-level netlists to prepare circuits for effective encryption and integration

Projects

Final Year Cybersecurity Capstone — **Abu Dhabi, UAE**

Student — *August 2024-Present*

- Prefix-tuning LLMs for controlled secure code generation with different LLMs
- Using Instruction tuning + In-context learning to further optimize LLMs performance

CSAW AI Hardware Attack Challenge — **Abu Dhabi, UAE**

Finalist — *October 2024-November 2024*

- Devised a new methodology utilizing GPT-4o for hardware security, focusing on knowledge bases and few-shot prompting to eliminate the need for extensive fine-tuning
- Constructed manual Chain of Thought (CoT) prompts to navigate context limitations
- Developed and tested hardware trojans within a RISC-V core- achieving a medium severity score of 6.5, validating the effectiveness of the model-generated security threats

SKILLS

Computer: C++, C, Python, C#, VHDL, Verilog, CircuitVerse, LTspice, Shell Scripting, Linux, Git/GitHub, Data Analysis, Pandas, NumPy, Predictive Modeling, HTML, Javascript, CSS, MATLAB, RegEx, Canva, Microsoft Office