ANTHONY ETIM

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EDUCATION

Yale University, New Haven, CT   August 2021 – Present
Ph.D. in Electrical Engineering
Research Assistant, Computer Architecture and Security Lab (CASLAB).
Advisor: Prof. Jakub Szefer

Yale University, New Haven, CT   August 2021 – May 2024
M.S., M.Phil. in Electrical Engineering

Villanova University, Villanova, PA   August 2017 – May 2021
B.S. in Electrical Engineering,
Minors in Computer Science and Computer Engineering

TECHNICAL SKILLS

Programming: Python, C++, C, MATLAB, Java, SQL, VHDL, Verilog，SystemVerilog, Haskell
Tools: AWS, Xilinx Vivado/ISE, Quartus, GitHub, PyTorch.
Technological Devices: Raspberry Pi, Arduino.
Expertise: FPGA, Computer Architecture, Hardware Security, AI Security, Machine Learning, Deep Learning.

PUBLICATIONS

- **Anthony Etim** and Jakub Szefer. "Time Traveling to Defend Against Adversarial Example Attacks in Image Classification". arXiv preprint, 2024.

- Ferhat Erata, TingHung Chiu, **Anthony Etim**, Srilalith Nampally, Tejas Raju, Rajashree Ramu, Ruzica Piskac, Timos Antonopoulos, Wenjie Xiong, and Jakub Szefer. "Systematic Use of Random Self-Reducibility in Cryptographic Code against Physical Attacks". Accepted by the IEEE International Conference on Computer-Aided Design **(ICCAD)**, 2024.

- **Anthony Etim**, Shanquan Tian, and Jakub Szefer. "Extending FPGA Information Leaks with Trojan Phantom Circuits". Accepted by the IEEE International Symposium on Secure and Private Execution Environment Design (**SEED**), 2024.

- Theodoros Trochatos, **Anthony Etim,** and Jakub Szefer. "Covert-channels in FPGA-enabled SmartSSDs". Accepted by the 22nd International Conference on Field-Programmable Technology (**FPT**), Journal Track at ACM Transactions on Reconfigurable Technology and System **(TRETS)**, 2023.

RESEARCH EXPRIENCE

Yale University, *Graduate Researcher*, New Haven, CT   August 2021 – Present
- Ongoing research on novel attacks and defenses in machine learning algorithms.
- Ongoing research on fault-injection attacks and defenses against cryptographic code in hardware.
- Conducted research on attacks on machine learning accelerators to exploit vulnerabilities and extract sensitive information.

- Conducted research on information leaks in FPGA-accelerated cloud environments using Ring Oscillators (ROs) and Time to Digital Converters (TDCs) to sense voltage and thermal changes.

Villanova University, *Undergraduate Researcher*, Villanova, PA   Fall 2020 – Spring 2021
- Developed a deep neural network to achieve a secrecy capacity for efficient, reliable and secure transmission of information.

Villanova University, *Undergraduate Researcher*, Villanova, PA   Fall 2020
- Used Matrix Singular Value Decomposition (SVD) technique to optimize the deep neural network (DNN) on the AVNET Ultra96-V2 FPGA development board.
- Evaluated the performance, accuracy, and energy consumption of the optimized system.

Villanova University, *Undergraduate Researcher*, Villanova, PA   Spring 2020
- Estimated the added value and future costs of coordinated economics dispatch in Central America through the electrical system load.
- Trained the neural network to forecast the electrical system load.

Villanova University, *Undergraduate Researcher*, Villanova, PA   Summer 2019
- Collaborated with a team of 3 in conjunction with L3 Harris in the creation of an efficient food purchasing and tracking system for dining services to reduce food waste.
- Developed software system that is simple to populate and used to track purchased quantities and consumption to reduce waste significantly.
- Filed a provisional patent for the software system.

Villanova University, *Undergraduate Researcher*, Villanova, PA   March 2018 – May 2019
- Conducted research on the development of the flow network modeling tool Villanova Thermodynamic Analysis of Systems (VTAS), which models the energy flows throughout a data center.
- Upgraded the Graphical User Interface (GUI) for the Villanova Thermodynamic Analysis of Systems (VTAS) data center flow network modeling tool.
- Developed the GUI Interface for the VTAS electrical system layout.

PROFESSIONAL EXPERIENCE
Electrical Engineering Intern, National Grid, Albany, NY, Remote   Summer 2020
- Collaborated with a team of 4 engineers to help reorganize and plan the grid network using various tools.
- Modelled data to fit various design requirements and constraints of the power system.
- Assisted in the management and creation of a SharePoint Setting Repository for the handoff of smart control settings to the field device engineers.
- Collaborated with other engineers to build a database of DMX and control house plans for the grid network.

Web Developer Intern, Kumba Africa, Philadelphia, PA   Summer 2018
- Built reusable code to be utilized in other projects, effectively streamlining spending.
- Contributed back-end experience and collaborated on APIs.
- Collaborated on the design and development on a team of 4 of client and server database applications.
- Analyzed project requirements to find bugs and eliminate issues within a timely manner.

TEACHING EXPERIENCE

- **Teaching Fellow,** Yale University, New Haven, CT   Spring 2023
  Introduction to Computer Engineering (EENG 201)
- **Teaching Fellow,** Yale University, New Haven, CT   Fall 2022
  Introduction to Electronics (EENG 200)

POSTERS

- April. 2024. Extending FPGA Information Leaks with Trojan Phantom Circuits. New England Hardware Security Day, Worcester Polytechnic Institute, MA.
- April. 2023. Thermal Covert Channels on SmartSSDs. New England Hardware Security Day, Northeastern University, MA.
- Oct. 2019. Feastimate. Future of Packaging Consortium, Villanova University, PA
- April. 2019. Improving the user interface of Data center modeling Software. (Project #1) Center for Energy-Smart Electronic Systems, Industrial Advisory Board Meeting at Binghamton University, NY.
- Oct. 2018. Improving the user interface of Data center modeling Software. (Project #1) Center for Energy-Smart Electronic Systems, Industrial Advisory Board Meeting at Villanova University, PA.
- Sep. 2018. Improving the user interface of Data center modeling Software. Undergraduate Research Symposium at Villanova University, PA.

SERVICE

- **Yale Cloud Computing and FPGA Security Symposium (CCFS) 2022,** Co-organizer
                                                                    November 2022
- **Yale Grad Society of Women Engineers,** Undergrad Liaison Co-chair   Fall 2022 - Present

LEADERSHIP EXPERIENCE
Tau Beta Pi, National Engineering Honor Society, Villanova Chapter, Vice-President
                                                                    March 2020-May 2021
- Planned and conducted various professional events for the chapter's members such as the initiation information session for new members.
- Helped in the advancement of the technical and professional education of the active members by connecting them with various alumni.

Villanova Engineering Student Council, Co-Chair   September 2019- May 2021
- Planned events for the College of Engineering and acted as a bridge between the students and faculty.

National Society of Black Engineers, Senator   August 2017-September 2018
- Represented Villanova chapter at the 2017 Fall Regional Conference in Greensboro, NC.

SELECTED HONORS AND AWARDS
- AsianHOST PhD Forum   December 2024
- Yale New Student Fellowship   September 2021
- Dean's Award for Academic Excellence   May 2021
- Dean's Award for Meritorious Service   May 2021
- Dean's List   December 2017 - May 2021
- Tau Beta Pi, the National Engineering Honor Society,   Spring 2020

    Selected based on academic ranking 1/8th of the junior class.
- Klingler Unitas Prize,   April 2020
    Villanova Student Entrepreneurship Competition
- Klingler Unitas Prize,   April 2019
    Villanova Student Entrepreneurship Competition