# Ruben Purdy

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## EDUCATION

**Carnegie Mellon University**, Pittsburgh, PA **August 2019 - Present**
PhD, Electrical and Computer Engineering
Research Advisor: Shawn Blanton
GPA: 3.93

**University of Arizona**, Tucson, AZ **August 2015 - May 2019**
B.S., Computer Engineering, minor in Mathematics
Research Advisor: Ali Akoglu
Honors, *summa cum laude*

## RESEARCH EXPERIENCE

**Research Assistant** **August 2019 – Present**
*Carnegie Mellon University Advanced Chip Test Laboratory, Pittsburgh, PA*

- Researching IC manufacturing test, hardware security, and energy-efficient machine learning architectures.
- Mentored multiple undergraduate and master's students through semester-long research projects.

**Undergraduate Research Assistant** **January 2018 – May 2019**
*University of Arizona Reconfigurable Computing Laboratory, Tucson, AZ*

- Explored and implemented neuromorphic architectures and algorithms.

## PROFESSIONAL HISTORY

**Ph.D. Intern** **June 2023 – August 2023**
*Apple, Cupertino, CA*

- Developed novel fault models and applied them to silicon.

**Summer Academy for Math and Sciences Instructor** **June 2021**
*Carnegie Mellon University, Pittsburgh, PA*

- Instructed high school students and developed curriculum concerning data science and machine learning.

**Software Developer Intern** **June 2018 – August 2018**
*American Express, Scottsdale, AZ*

**Student iOS Developer** **November 2016 – March 2018**
*University of Arizona, Tucson, AZ*

## PUBLICATIONS

[1] C. Nigh, R. Purdy, W. Li, S. Mitra and R.D. Blanton, "Faulty Function Extraction for Defective Circuits," European Test Symposium. IEEE, 2024.

[2] Wei Li, Ruben Purdy, Jose Moura, Shawn Blanton, "Characterize the ability of GNNs in attacking logic locking", Workshop on Machine Learning for CAD. ACM/IEEE, 2023.

[3] Y. Qin, R. Purdy, A. Probst, C. Lin, and J. Zhu. "Non-linear CNN-based Read Channel for Hard Disk Drive with 30% Error Rate Reduction and Sequential 200Mbits/second Throughput in 28nm CMOS," *Journal of Solid-State Circuits*. IEEE, 2023.

[4] Y. Qin, R. Purdy, A. Probst, C. Lin, and J. Zhu. "ASIC Implementation of Non-linear CNN-based Data Detector for TDMR System in 28nm CMOS at 200Mbits/s Throughput," *Transactions on Magnetics*. IEEE, 2022.

[5] Y. Qin, R. Purdy, A. Probst, C. Lin, and J. Zhu. "Non-linear CNN-based Read Channel for Hard Disk Drive with 30% Error Rate Reduction and Sequential 200Mbits/second Throughput in 28nm CMOS," *Symposium on VLSI Circuits*. IEEE, 2022.

[6] R. Purdy and R.D. Blanton. "Large-Scale Logic-Locking Attacks via Simulation," *International Symposium on Quality Electronic Design*. IEEE, 2022.

[7] J. Sweeney, R. Purdy, R.D. Blanton, and L. Pileggi. "CircuitGraph: A Python Package for Boolean Circuits," *Journal of Open Source Software.* 2020.

[8] J. Mack, et al. "RANC: Reconfigurable Architecture for Neuromorphic Computing." *Transactions on Computer-Aided Design of Integrated Circuits and Systems*. IEEE, 2020.

[9] S. Valancius, et al. "FPGA Based Emulation Environment for Neuromorphic Architectures," *International Parallel and Distributed Processing Symposium Workshops*. IEEE, 2020.

## POSTERS

[10] R.D. Blanton, D. Duvalsaint, R. Purdy, "Security Metrics for Logic Circuits", *International Symposium on Hardware Oriented Security and Trust*. IEEE, 2022.

[11] R. Purdy, et al. "Architectures and Applications of Neuromorphic Computing", *I/UCRC on Cloud and Autonomic Computing, Semiannual Industry Advisory Board Meeting*. NSF, 2018.

## HONORS & AWARDS

**Carnegie Mellon University**, Pittsburgh, PA
Qualcomm Innovation Fellowship **2024**

**Carnegie Mellon University**, Pittsburgh, PA
Apple PhD Fellowship in Integrated Systems **2024**

**Carnegie Mellon University**, Pittsburgh, PA
David H. Barakat and LaVerne Owen-Barakat Dean's Fellowship **2021**

**University of Arizona**, Tucson, AZ
Wildcat Excellence Scholarship **2015 - 2019**

**University of Arizona**, Tucson, AZ
Dean's List with Distinction **2016-2017**