Nojan Sheybani

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US Citizen

Education

University of California San Diego — San Diego, CA
PhD Student in Electrical and Computer Engineering — May 2025

University of Virginia — Charlottesville, VA
BS in Computer Engineering With Highest Distinction. Cumulative GPA: 3.93 Major GPA: 3.93 — May 2020

Research Interests

Privacy-Preserving Computation, Zero Knowledge Proofs, Hardware Security, Computer Architecture, HW/SW Co-design, Robust Machine Learning, and IoT applications

Work Experience

University of California San Diego — San Diego, CA
Graduate Research Assistant Advised by Prof. Farinaz Koushanfar — June 2020 — Present

- Leveraging hardware and software co-design to develop intelligent, data-intensive and secure embedded computing applications and systems

Intel Labs — San Diego, CA & Hillsboro, OR
DARPA DPRIVE Security and Privacy Graduate Research Intern — June 2022 — Present

- Exploring extension of DARPA DPRIVE accelerator to support Zero-Knowledge Succinct Non-Interactive Arguments of Knowledge (zk-SNARK)

Security and Arithmetic Circuits Research Intern — June 2021 — September 2021

- Invented 2 novel techniques for efficient hardware implementation of Fully Homomorphic Encryption (FHE) operations for the DARPA DPRIVE accelerator, resulting in co-inventor status on 2 invention disclosures
- Developed Python model to simulate core operation for FHE bootstrapping, which shows latency, memory access patterns, and other crucial attributes pertaining to hardware performance

Cisco — San Diego, CA
Security Engineering Intern — August 2020 — September 2020

- Developed the backend of the Cloud Trust Anchor Service, a cloud neutral, self-managed trust anchor service

University of Virginia — Charlottesville, VA
Undergraduate Research Assistant Advised by Prof. Benton Calhoun — September 2016 — May 2020

- Conducted research on low-power digital circuits and low energy electronics for research/medical applications, with a focus on piezoelectric rectifiers
- Characterized tradeoffs between dynamic-leakage suppression transistor configuration and static-CMOS for self-powered systems

Appian — McLean, VA
Software Engineering Intern — June 2019 — August 2019

- Worked on the Kubernetes Operator written in Go, which deploys the Appian platform in Kubernetes and manages it automatically, and pushed code to internal production daily

AT&T (DIRECTV) — El Segundo, CA
Software Engineering Intern — May 2018 — August 2018

- Automated generation and upload of channel stream configuration files for ads using Ansible and Yospace API
- Analyzed edge logs from 3rd party source to observe efficiency of dynamic ad insertion during primetime hours

Trivium Financial Group — Charlottesville, VA
Software Engineering Intern — July 2017 — August 2017

- Assisted in development of major risk-mitigating financial modeling platform, which condensed the amount of time taken to generate a complex financial model from a few weeks to a few hours

Technical Skills

ECE: VHDL/Verilog, Cadence, Vivado HLS, NI Multisim, NI Ultiboard, LabVIEW, Virtual Bench, Logisim
Courses: VLSI, Embedded Systems, Embedded Testing and Validation, Electronics, Computer Architecture, Computer Networks, Self-Powered IoT Systems, Signal Processing, Probability and Random Processes

CS: PyTorch, Tensorflow, Python, C/C++, MATLAB, R, Go, Bash, React/React Native, Git
Courses: Learning Algorithms, Neural Networks, Operating Systems, Data Structures, Algorithms, Data Science, Software Development

Publications and Presentations

SenseHash: Computing on Sensor Values Mystified at the Origin *May 2022*
N. Sheybani, X. Zhang, S. U. Hussain, F. Koushanfar
IEEE Transactions of Emerging Topics in Computing Special Section on Hardware Security Journal

zPROBE: Zero Peek Robustness Checks for Federated Learning *May 2022*
Z. Ghodsi*, M. Javaheripi*, **N. Sheybani***, X. Zhang*, K. Huang, F. Koushanfar
**Equal contribution*
In Review for NeurIPS 2022 link

FastStamp: Accelerating Neural Steganography and Digital Watermarking of Images on FPGAs *May 2022*
S. Hussain*, **N. Sheybani***, P. Neekhara*, X. Zhang, J. Duarte, F. Koushanfar
**Equal contribution*
In Review for ICCAD 2022

Tailor: Altering Skip Connections for Resource-Efficient Inference *May 2022*
O. Weng, A. Khodamoradi, G. Marcano, **N. Sheybani**, R. Kastner, F. Koushanfar, K. Denolf
In Review for ICCAD 2022

AccHASHTAG: Accelerated Hashing for Detecting Fault-Injection Attacks on Embedded Neural Networks *January 2022*
N. Sheybani, M. Javaheripi, J. Chang, F. Koushanfar
Hardware Demo for HOST 2022

HAtNet: Hardware Attestation of Neural Networks *January 2022*
N. Sheybani, H. Chen, X. Zhang, S. Hussain, F. Koushanfar
Hardware Demo for HOST 2022

Is Revolutionary Hardware for Fully Homomorphic Encryption important? What else is needed? *August 2021*
C. Bonte, R. Cammarota, W. Dai, J. Fryman, H. Gong, D. Kim, R. Kumar, K. Laine, P. Lalwaney, **N. Sheybani**, A. Rajan, A. Reinders , M. Steiner, V. Suresh, S. Taneja, M. Trifan, A. Viand, W. Wang, W. Wang, C. Wilkerson, J. Yang
COSADE 2021 link

A Self-Powered and LoRa-Based Fleet Tracker: Demonstrating Improved Reliability in the IoT *March 2020*
V. Lin, J. Dugan, **N. Sheybani**, N. Krzysztofowicz, M. Miller, H. Powell
IEEE Southeastcon 2020 [link]

The Role of Affective Skills in the Engineering Classroom *March 2020*
N. Sheybani, M. Miller, H. Powell, J. Dugan
American Society for Engineering Education Southeastern Section Conference 2020, Poster (Accepted but could not attend)

Qualitative Skill Development in Engineering Education *May 2019*
2019 Innovations in Pedagogy Summit, Presentation
N. Sheybani, M. Miller

Teaching Experience

Advanced Digital Design Project (ECE 111), UCSD *TA to Prof. Farinaz Koushanfar* Fall 2021
Computer Architecture (ECE 4435/6435), UVA *TA to Prof. Ronald Williams* Spring 2020
Digital Logic Design (ECE 2330), UVA *TA to Prof. Joanne Dugan* Spring 2020
Nao Robots (ECE 1501), UVA *Instructor* Spring 2019

Electronics (ECE 2660), UVA *TA to Prof. Ronald Williams* Fall 2018
Electronics (ECE 2660), UVA *TA to Prof. Scott Barker* Spring 2018
Introduction to Engineering (ENGR 1620), UVA *TA to Prof. Keith Williams* Fall 2017

Honors and Awards

DAC Young Fellow *UCSD* 2021
Halicioğlu Data Science Institute Graduate Prize Fellowship *UCSD* 2020
Electrical and Computer Engineering Department Fellowship *UCSD* 2020
Graduation with Highest Distinction *UVA* 2020
Best Senior Capstone *Awarded to team with best project as decided by UVA ECE faculty* 2020
Raven Society *UVA* 2020
IEEE Eta Kappa Nu Leadership *UVA* 2019
Intermediate Honors *UVA* 2018
Dean's List *UVA* 2016-2020

Community Involvement

Jacobs Undergraduate Mentorship Program (JUMP) September 2020 — Present
Raven Society *Member* November 2019 — Present
Institute of Electrical and Electronics Engineers (IEEE) *Member* August 2016 — Present
Association for Computing Machinery (ACM) *Member* August 2016 — Present
Eta Kappa Nu *Leadership* May 2019 — May 2020
HackCville *Student Member* May 2017 — May 2020
Madison House *Youth Soccer Coach* September 2017 — November 2017
Kids Making A Difference, LLC *Founder and President (curesearch.org/nojan-sheybani)* May 2015 — July 2017