Nathaniel Nauman

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EDUCATION

PURDUE UNIVERSITY
MS in Computer Engineering
May 2023 | West Lafayette, IN

PURDUE UNIVERSITY
BS in Computer Engineering
Dec 2022 | West Lafayette, IN
Honors College Cum. GPA: 3.71 / 4.0

QALAM WA LAWH
Intermediate Level in Arabic
Aug 2019 | Rabat, Morocco
NSLI-Y U.S. State Department

COURSEWORK

GRADUATE
MEMS & IC Fabrication Laboratory
Electromagnetic Field Theory
Applied Quantum Computing
Data Analysis and Experiment Design
Fundamentals of Current Flow
Intro to Quantum Transport
Boltzmann Law Physics of ML
Fault-Tolerant Computer Design
Artificial Intelligence

UNDERGRADUATE
Computer Design & Prototyping
ASIC Design Laboratory

SKILLS

PROGRAMMING
C • Python • SystemVerilog • Verilog
MIPS, ARM Assembly • MATLAB
Shell • Fusion 360 • KiCad

LANGUAGES
English (Fluent) • French (Proficient)
Arabic (Proficient) • Bangla (Beginner)

PROJECTS

MULTI-CORE PROCESSOR
Aug 2021 – Dec 2021
Designed and tested pipelined multi-core processor with cache coherence on FPGA.

FPGA USB TRANSMITTER
Jan 2021 – May 2021
Synthesized hardware for USB with CRC.

MAZE-SOLVING ROBOT
Jan 2020 – May 2020
Integrated robot with GrovePi sensors to train path-finding algorithm in Python.

RESEARCH

PROFESSOR DATTA'S LABORATORY | Research Assistant
May 2021 - Pres | Supv: Thomas Duncan Distinguished Prof. Supriyo Datta
- Creating p-bit accelerator to perform numerical analysis on systems modeled by strongly nonlinear stochastic differential equations
- Developed p-bit hardware for probabilistic ML and Monte Carlo sampling

QUANTUM SEMICONDUCTOR SYSTEMS | Research Assistant
May 2022 - Pres | Supv: Bill & Dee O'Brian Distinguished Prof. Michael Manfra
- Built dilution refrigerator sample carrier for fractional quantum Hall effect data

FAULT-TOLERANT COMP. SYST. DESIGN | Student Researcher
Jan 2022 - Jun 2022 | Supv: Prof. Saurabh Bagchi
- Developed bounded error IIR filter in programmable switches for IoT data

SOYBEAN PRODUCT INNOVATION COMPETITION | Winner
Sep 2020 – Apr 2021 | Supv: Distinguished Prof. Michael Ladisch
- Won first place with an award of $20,000 and invited to present to the state senate at the Industry Affairs committee

LAB OF RENEWABLE RESOURCES ENGR. | Research Assistant
Sep 2019 – Apr 2021 | Supv: Distinguished Prof. Michael Ladisch
- Experimented on proteases in enzymatic hydrolysis for new soy biostimulant

May 2018 – Aug 2018 | Supv: Distinguished Prof. Michael Ladisch
- Analyzed protein samples with HPLC and co-authored reports for Eli Lilly

LEADERSHIP EXPERIENCE

INVERSE KINEMATICS ARM | Senior Design Team Leader
Jul 2021 – Dec 2021 | Embedded Systems Design Team
Led group of 4 to construct arm with cabling linkages and inverse kinematics. Programmed system in embedded C and simulated mechanics in Python.

PURDUE SOLAR RACING | Electrical Lead & VP of Operations
Aug 2018 – May 2022 | Solar-Powered Car Student Organization
Designed a PMSM controller; organized workshops, meetings, and the website.

AWARDS

2022 ECE Undergraduate Excellence Award Honorable Mention
2021 Winner of $20,000 Student Soybean Product Innovation Competition
2019 Purdue Trustees Scholarship and two CFGL scholarships
2019 Full Scholarship from Nat'l. Security Language Initiative for Youth
2018 Winner of Districts Tournament for Nat'l. Speech and Debate Assoc.
2017 Awarded top 35 high-school poets in U.S. by Nat'l. Student Poets Assoc.

PUBLICATIONS AND POSTERS

[1] N. Nauman, J. Kaiser, and S. Datta. P-bit and FPGA acceleration of sampling for modeling log-normal colored noise in nonlinear oscillator. *Poster presented at: The Elmore ECE Emerging Frontiers Center on the Crossroads of Quantum and AI*, 2022.

[2] N. Nauman, R. Wu, and S. Bagchi. Real-time digital filtering for IoT data in programmable network switches. *52nd Annual IEEE/IFIP International Conference on Dependable Systems and Networks - Supplemental Volume (DSN-S)*, 2022.