

Nathaniel Nauman

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Education

PURDUE UNIVERSITY

MS IN ELECTRICAL ENGINEERING
May 2023 | GPA: 4.0/4.0

PURDUE UNIVERSITY

BS HONORS IN COMP. ENGINEERING
Dec 2022 | GPA: 3.72/4.0

QALAM WA LAWH

INTERMEDIATE LEVEL IN ARABIC
Aug 2019 | Rabat, Morocco

Graduate Coursework

MEMS & IC Design and Fabrication
Applied Quantum Computing
Quantum Transport and Current Flow
Fault-Tolerant Computer Design
Artificial Intelligence
Computer Design & Prototyping

Skills

PROGRAMMING

C • Python • MIPS, ARM Assembly
Verilog • KiCad • Fusion 360

LANGUAGES

English (Native) • Conversational in
French, Arabic, and Bengali

Projects

DEVICE FABRICATION

Aug 2022 – Dec 2022
Used ALD, lithography, and wet etching to fabricate MEMS cantilevers in the Birck Nanotechnology Center cleanroom

MULTI-CORE PROCESSOR

Aug 2021 – Dec 2021
My teammate and I built a pipelined multi-core processor with caches on FPGA. I wrote a dual-thread merge sort code in assembly to compare single-core and multi-core performance by measuring instruction latency and rate

FPGA USB TRANSMITTER

Jan 2021 – May 2021
I led a small team to build a USB and data buffer on FPGA and taught others how to implement cyclical error-checking

MAZE-SOLVING ROBOT

Jan 2020 – May 2020
Trained a path-finding algorithm in Python

Research

PROFESSOR DATTA'S LABORATORY | RESEARCH ASSISTANT

May 2021 – Pres | Supv: Thomas Duncan Distinguished Prof. Supriyo Datta

- Created probabilistic-bit accelerator to perform numerical analysis on systems modeled by strongly nonlinear stochastic differential equations

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

- Led a small team to offload analytics onto programmable switches by developing filter hardware; then I presented at the 2022 intl. DSN conference

SOYBEAN PRODUCT INNOVATION COMPETITION | WINNER

Sep 2020 – Apr 2021 | Supv: Distinguished Prof. Michael Ladisch

- Won first place with an award of \$20,000; then I presented 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

- Used high-performance liquid chromatography to analyze proteins for Eli Lilly

Leadership Experience

INVERSE KINEMATICS ARM | SENIOR DESIGN TEAM LEADER

Jul 2021 – Dec 2021 | Embedded Systems Design Team
As team leader, my team and I built a smart hexapod leg that finds the optimal path to any coordinate. We achieved 3:1 force multiplication with our revolutionary new elbow joint designs by developing pulley-cabling linkages based on tendons

PURDUE SOLAR RACING | ELECTRICAL LEAD & VP OF OPERATIONS

Aug 2018 – May 2022 | Solar-Powered Car Student Organization
Organized workshops for designing the motor controller and battery management

Awards

- 2023 NSF Graduate Research Fellowship and State Department CLS recipient
- 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
- 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.