

Rohan I. Ojha

B.S. Electrical Engineering • Quantum Technology/Microelectronics and Semiconductors Concentrations
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Education

Purdue University - Senior	GPA: 3.97	2022-25
<ul style="list-style-type: none">• <i>Honors:</i> John Martinson Honors College, Dean's List and Semester Honors• <i>Scholarships:</i> Charles W. Brown ECE Scholarship, National Merit, Danone Scholarship		
Montgomery Blair High School (Math , Science , CS Magnet) - Silver Spring, MD	WGPA: 4.78	2018-22

Coursework and Skills

- **Engineering:** Analog/Digital Circuitry, LTspice, Signals & Systems, Soldering, SystemVerilog, ASIC Design
- **Programming:** Python, C, RISC-V, MATLAB, Java, R, HTML, Javascript, Bash, Final Cut Pro, Excel, PyTorch, GitHub
- **Machine Learning:** Deep Learning, PyTorch, Tensorflow, Keras via IBM courses through edX (see [LinkedIn profile](#) for details)
- **Quantum Science:** Quantum Mechanics, Circuitry, Algorithms, Qiskit, Q#, Single Photon Emitters, TCSPC
- **Physics:** Mechanics, Electrodynamics, Semiconductors, Quantum Physics

Experience

- **Sandia National Laboratories Center for Cyber Defenders (CCD) Intern** May 2024 - Present
 - Quantum Error Correction
 - Quantum-Resistant Root of Trust
- **Purdue Quantum Science and Engineering Institute Quantum Nanophotonics Lab Researcher** Feb 2023 - Present
 - **Publication:** (submitted, SPIE Photonics 2024), Authentication Through Residual Attention-based Processing of Tampered Optical Responses
 - How do we reliably detect adversarial tampering in gold nanoparticle-based [Physically Unclonable Functions \(PUFs\)](#) for semiconductor devices? In order to tackle the \$75 billion counterfeit semiconductor industry, we propose a nanoparticle based PUF and Residual, Attention-based tampering detection algorithm. PUFs are unique, random physical “fingerprints” used for quality assurance and detection of malicious tampering.
 - Designed semantic segmentation models with STEGO for identifying nanoparticles in dark field microscope images.
 - Developed solutions to PUF subgraph matching using Siamese CNNs and other deterministic methods.
 - Performed spectral analysis of [Quantum Emitters in Aluminum Nitride Induced by Zirconium Ion Implantation](#)
 - Wrote automation and control software (e.g. linear actuator, power meter, variable attenuator drivers) for Hanbury Brown and Twiss experimental setup to assess Single Photon Emitters and optimize their fabrication
 - Explored the application of photonics techniques such as Single Photon Emitters and metamaterials to LiDAR systems
 - Contributed to [Polytensor](#), a python package for CUDA-accelerated, parallel polynomial evaluation and regression.
 - **Skills:** Deep Learning, PyTorch, Automation, Literature Review, Spectral Analysis
- **Purdue Electrical Engineering Fundamentals (ECE 20001) Undergraduate Teaching Assistant** Aug 2023 - Present
- **Purdue Quantum Game Club** Jan 2023 - Present
 - Developed [Quantum Convolutional Neural Network \(QCNN\)](#) leveraging quantum hardware to classify MNIST images
 - Learned quantum circuitry Qiskit for use in simulation/research projects using quantum machines and concepts
- **National Institute of Standards and Technology (NIST) Physical Measurement Laboratory (PML).** Jun 2021 - Aug 2022
 - Performed research as Intern, Nanoscale Device Characterization Division
 - Controlled Scanning Tunneling Microscope (STM), used Feedback-Controlled Lithography to create dangling bonds on Hydrogen-terminated Silicon chips for atom-specific patterning of Phosphate
 - Developed automated atom/dangling bond location and STM image lattice determination algorithms in Java for use in [Atom-Based Device navigation](#) and control software to facilitate/automate STM procedures

Awards and Honors

- **Semiconductor Fabrication 101 Certificate:** Purdue, UT Austin, and Intel sponsored course 2024
- **Private Pilot Glider License:** (at age 16), 46 hours in Schleicher ASK-21, funded by O'Callaghan Scholarship 2022
- **International Science and Engineering Fair (ISEF),** 3rd Place (\$1,000), Physics and Astronomy Category, awarded 2021
for work in ["Periodicity Felicity"](#), searching for binary black hole candidates