ELAN ZACHARIAH LANDAU
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EDUCATION

Texas A&M University (TAMU), College Station, TX **Fall 2025 - Present**
PhD program in Computer Engineering; GPA: 4.0/4.0
Advisor: Professor Paul Gratz, Electrical & Computer Engineering (ECE)
- Identifying computer architecture techniques to improve the performance of sparse computations such as those on compressed sparse row format matrices and graph search.

University of New Mexico (UNM); Albuquerque, NM **Fall 2021 - May 2025**
Double Major; B.S. **Computer Engineering** and B.S. **Mathematics**
GPA: 4.20/4.0; Dean's List every semester; Suma Cum Laude

Central New Mexico Community College (CNM); Albuquerque, NM **Summer 2018 - Summer 2023**
GPA: 4.0/4.0; Non-degree / supplemental coursework.

ACADEMIC/RESEARCH EXPERIENCE

Purdue University; West Lafayette, IN **Summer 2024**
Undergraduate Research Fellow in Summer Intensive Research Internship (SIRI) and Summer Undergraduate Research Fellowship (SURF) program
PI: Professor Yung-Hsiang Lu, ECE
- Trained linear, convolutional and recurrent machine learning (ML) models for classification and autoregression.
- Collaborated in Computer Transcription team in the Artificial Intelligence for Musicians research group.
- Performed literature review on Automated Music Transcription (AMT).
- Prepared report on performance of the state-of-the-art for AMT including convolutional and transformer ML models as well as commercial software.
- Proposed new technique using Mamba ML model for improving performance.
- Presented technical ideas and results in poster session at end-of-summer conference.

UNM; Albuquerque, NM **Fall 2023 - Spring 2024**
ECE Undergraduate Research
PI: Professor Xiang Sun, ECE
- Learned and utilized software-defined networking (SDN), OpenFlow, and Better Approach To Mobile Ad Hoc Networking (BATMAN) to control a mesh network for algorithm tests.
- Implemented a custom OpenFlow controller following the OpenFlow 1.3 specification.

UNM Center for High Technology Materials; Albuquerque, NM **Summer 2022**
Quantum Undergraduate Research Experience at CHTM (QU-REACH)
PI: Professor Susan Atlas, Department of Chemistry and Chemical Biology
- Used Python and Bash to implement and compute Quantum Chemistry and Density Functional Theory based calculations of relative entropy, atom-in-molecule decompositions, and molecular charge distributions.
- Utilized SLURM scheduler and supercomputing resources at Center for Advanced Research Computing (CARC).
- Presented technical ideas and results in poster session at end-of-summer conference.

WORK EXPERIENCE

Sandia National Laboratories; Albuquerque, NM **Summer 2023**
TITANS Summer Intern
Completed the following projects ahead of schedule:
- Wrote API endpoint backend in C# for Microsoft Azure Active Directory with multi-person team and codebase.
- Built, flashed, fixed, and improved petalinux/yocto project with Xilinx microblaze soft core for embedded Linux.
- Debugged Linux networking stack to improve performance.
- Wrote UDP network relay.

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AWARDS/SCHOLARSHIPS

TAMU College of Engineering Horizons: 21 Fellowships for 21st Century Scholars (EHDF) **2025-2029**
National Merit Scholarship **2022-2025**
NM Lottery Success Scholarship **2022-2025**
NM Opportunity Scholarship **2022-2024**
UNM Scholars Scholarship **2021-2022**
UNM Tallant Cooper Scholarship **2023-2024**
UNM Undergrad Minority Scholarship **2022-2023**
UNM Walter King Memorial Scholarship **2021-2022**

TECHNICAL SKILLS & CERTIFICATIONS

Computer Programming and Software - Advanced Proficiency **11+ years' experience**
Assembly (ARM/THUMB/x64/RISC-V), Bash, C, C++, C#, Git, Haskell, Java, JavaScript, LabVIEW, LaTeX, Lean4, Linux, Make, Matlab, Python, Ruby, Rust, SLURM, SPICE, SQL, (System) Verilog, VHDL
Cadence SystemVerilog for Design and Verification certificate
Computer Automated Design - Intermediate Proficiency **1 year experience**
AutoCAD by AutoDesk, Creo Parametric by PTC
Ham Radio Technician Class license - Beginner Proficiency

HOBBIES/INTERESTS/PROJECTS

Selected Open-Source Contributions: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

HDLean **2025**
- Developing HDLean: using the Lean4 interactive theorem prover as a **hardware description language**; bringing logically sound dependent types and proofs to hardware design.

par **2025**
- Various contributions to par (a concurrent programming language based on session types and linear logic) including: a complete rewrite of the parser to improve error messages and extensibility, and optimizing the interaction net runtime to avoid certain quadratic slowdowns using safe rules and eta equivalence.

GPU accelerated simulation **2024**
- Learned GPU programming making a realtime, GPU accelerated, direct n-body simulation with 10,000 bodies.

Fambox - FFI Library **2024**
- Published library for handling C struct flexible array members safely and ergonomically in Rust.

Battlesnake Competitive Programming **2024**
- Reached 1st in battlesnake, a competitive programming competition, by writing and deploying a self-hosted server that responds to requests within 500ms by searching 50 million game states per second.

Incremental Downloader and Web Scraper **2024**
- Created incremental downloader and web-scraper CLI with sanitization and resistance to website changes.

Hardware Software Co-design Videogame **2023**
- As final project for Intermediate Logic Design, wrote a videogame based on brick-breaker and snake, with game logic in software communicating over AXI-GPIO to a custom FPGA graphics processor written in VHDL.

yap_streaming - Streaming Parser Combinator Library **2023**
- Published parser library for making parsers over input streams for simultaneous parsing and I/O.

audio-network-interface - Digital Signal Communications Over Sound Waves **2023**
- Learned and applied digital signal processing, communication, transmission, and forward error correction.
- Implemented CLI, GUI, and webpage with CI builds for modulated signals (OFDM, BPSK, ...) with FEC schemes (Reed-Solomon, Hamming, ...) over soundwaves; transmitting from a speaker and receiving by a microphone.

Website Example **2023**
- Learned web development with Python, Flask, and SQL to create a website with a database and registration.