

Darby Hanes

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EDUCATION

Texas Tech University

Dual Degree in Applied Physics and Electrical Engineering

Attended from ages 15-19

Sigma Pi Sigma Honor Society | Fulbright Scholarship Candidate

Lubbock, TX

Fall 2021-December 2025

GPA 3.8

AEROSPACE LEADERSHIP AND EXPERIENCE

Avionics Director

Raider Aerospace Society (RAS), Texas Tech University

Lubbock, TX

July 2024-Present

- Led biggest team in RAS history of 17 students, dividing and leading tasks involving both off the shelf components and student-led research and design projects
- Taught 12 freshman/sophomore students the basics of circuit design and theory, making schematics, and creating printed circuit boards using KiCad
- Collaborated with other sub-teams that required electronic work, including recovery and airbrakes systems
- Coordinated "L1 Factory", a workshop for new students to build L1 rockets at a discounted price and with the guidance of experienced rocketeers
- Volunteered with community outreach projects

Tripoli Certificates: L2 High Powered Rocketry, L3 estimated March 2025

Books and self study: Rocket propulsion elements, astrodynamics, model rocketry handbook, etc.

INTERNSHIPS

JT4

Digital Signal Processing Intern

Las Vegas, NV

June 2024-August 2024

- Created measures of performance and test matrices for Lease Mean Squares Adaptive Filters for testing on an analog test bench including spectrum analyzers, signal generators and an FPGA
- Simulated filter convergence using MATLAB and visualized via Power Spectrum and Wigner-Ville Distribution plots
- Measured power loss across N-type and SMA cables for use in analog test setup
- Collected and plotted signal to noise ratio data for verification of analog test setup validity

Sparx Engineering

Electrical Engineering Intern

Manvel, TX

May 2023-August 2023

- Built testing PCB from design to assembly, which included two adjustable filter circuits and an adjustable amplifier
- Using Altium, created new component footprints and schematics, then uploaded to internal SVN database
- 100+ hours soldering experience, especially with tiny surface mount components in sizes 0402, 0603 and 0805

United States House of Representatives TX-19 District Office

Congressional Intern

Lubbock, TX

January 2022-May 2022

- Helped constituents open federal cases over phone, packaged and mailed correspondence, organized briefings

Countertrace

Chemical Laboratory Intern

Manvel, TX

September 2020-August 2022 (Seasonal)

- Handled chemical hazards for tests, including infrared spectrometry, luminosity and thin layer chromatography

UNDERGRADUATE RESEARCH @ TEXAS TECH UNIVERSITY

Joshi Bio-Electrics Laboratory

May 2023-Present

- Using COMSOL, simulated thermal ablation of various tissue as a consequence of radiofrequency waves for use in a nanoparticle based non-invasive treatment for cancer
- Using NEURON, simulated action potential and heating effects on neuron cells

Advanced Particle Detector Laboratory

May 2022-May 2023

- Calibrated laser, assembled copper calorimeter for muon detection via scintillators, programmed and monitored Raspberry Pi weather stations that oversaw ISO 7 cleanrooms

SOME PERSONAL AND ACADEMIC PROJECTS

Bow Guide for Violin Students

Fall 2024

- Prototyped a bow guide for improved violin technique, from the perspective of an adult violin student

Automated HO-Scale Train

Fall 2024

- Programmed read/write capabilities on RFID interrogators, and created a program to cycle through 8 interrogators
- Using a Raspberry Pi, created a sorting algorithm with RFID input to collect and sort the model train cars

Personal Portfolio Website

Summer 2024

- Self-taught HTML, CSS and JavaScript to create a personal portfolio website hosted via GitHub

Certificates for Personal Development

Summer 2024

- Google Data Analytics, MathWorks System Engineering, Mechanical Engineering FE Prep

FPGA-Based Soccer-Playing Rover

Spring 2024

- Using Verilog, implemented PWM motor driver, inductive proximity sensors, solenoid activation and rover motion
- Built a bandpass PCB to filter audio signals, used oscilloscope for testing and validation

Maze-Solving Rover on MSP430

Spring 2024

- Programmed a maze solving algorithm, PWM motor driver and rover motion entirely in Assembly language

PCB for Ease of Testing

Summer 2023

- Designed and assembled PCBs containing amplifier, highpass, lowpass filtering circuits for easy component tests

8-Bit Breadboard Computer

Fall 2023

- Created an 8-bit computer on breadboards, consisting of RAM, a clock unit, instruction registers and more

TUTORING AND PEER MENTORING

Whitacre College of Engineering

Lubbock, TX

Controls Systems Tutor

September 2024-Present

- Led weekly problem solving sessions and guided students through root locus design, PID controllers, etc.

Whitacre College of Engineering

Lubbock, TX

Circuits Tutor

January 2023-May 2024

- Hosted tutoring sessions 3x a week, created project key for AC circuits oscilloscope project, led exam reviews

Teaching, Learning and Professional Development Center

Lubbock, TX

Calculus Learning Assistant

August 2021- December 2022

- Tutored in class problem solving sessions for sections of 100+ students concepts from limits through integration

LEADERSHIP & INVOLVEMENT

President

April 2024-Present

Society of Physics Students

Lubbock, TX

- Served as Secretary, 2022-2023
- Increased meeting attendance by 300% by holding networking opportunities and budgeting for provided dinners
- Collaborated with post-docs and professors to connect undergraduate students with research opportunities
- Planned and led a successful conference trip, with 8 students from the group presenting research
- Renovated lounge to create an inclusive environment for studying and tutoring

Vice President

May 2024-Present

Women in Physics

Lubbock, TX

- Led a resume and LinkedIn development session for undergraduate students in physics
- Revived a successful mentorship program for freshman and sophomore students in physics

Vice President

May 2024-Present

Sigma Pi Sigma

Lubbock, TX

- Led and organized poster competition with monetary prizes and over 25 participants and 12 judges
- Created a new scheduling system to ensure each judge saw the correct students and stayed on schedule

Human Rights and Advocacy Committee Head

September 2021-May 2022

Raiders Helping Other

Lubbock, TX

- Organized volunteering events and a Super Bowl fundraiser for the volunteering club