Nolan Groves

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Skilled programmer with a strong foundation built from physics, electronics, data-science, and research experience. Looking to create autonomous systems as the next generation of robotics. Extensive experience with demanding semiconductor hardware and software, requiring both mental flexibility and close attention to detail. Achievements include analysis of fluorescence spectroscopy using machine learning for medical diagnostics. Broad exposure to applied physics, hand-on electronics design, multiple programming languages, and advanced math.

Education

2017 – 2021 — **Bachelors degree in Physics with CS minor**, *Texas State University*, San Marcos, TX, 3.97 GPA.
Graduated *Summa Cum Laude*, Dean's list every semester

Notable Coursework

- *Advanced Lab* - Self-guided group projects with a focus on practical electronics. Projects included an automated high-vacuum chamber and a drone capable of limited autonomous flight. Learned to integrate hardware and software components with Arduino and Labview, as well as the basics of PID systems and control loops.
- *Applied Electronics* - Basic circuit design and analysis with a hands-on focus. I designed and built a 1000V coil-gun to accelerate a load. Practical experience also included soldering, component selection, and high voltage safety.
- *Other Notable Courses* - Electromagnetic Theory I & II, Calculus III, Quantum Mechanics, Statistical Physics, Differential Equations, Assembly Language, Data Structures & Algorithms

2012 – 2016 — **IB Diploma**, *Westwood High School*, Austin, TX, 4.0 GPA.

Research Experience

May 2019 – May 2021 — **Lab Tech**, *Texas State University*, San Marcos, TX.
Worked under Dr. Mark Wistey in Molecular Beam Epitaxy (MBE) research. Found robust, creative solutions to multiple challenges in hardware and software in ultra-high vacuum equipment.

- Reverse engineered legacy code to add new sensors and controls, and debugged and implemented multiple instrumentation and control interfaces.
- Helped design and build water chiller units with digital controls.
- Upgraded to new hardware control systems.
- Assisted with intricate repairs and upgrades to $1M ultra-high vacuum equipment under strict contamination requirements.

Fall 2021 — **Undergraduate Research - Machine Learning**, *Texas State University*, San Marcos, TX.
Worked as part of a project to identify irregularities in goat blood via spectrography. Implemented a neural network using TensorFlow to categorize the spectral data. The nature of the collected data resulted in machine learning being a poor fit for the processing method, and further research is ongoing.

Spring 2020 — **Undergraduate Research - FTIR**, *Texas State University*, San Marcos, TX.
Analyzed the feasibility of utilizing Fourier Transform Infrared Spectroscopy (FTIR) to produce a compact, single chip replacement for a tabletop optical spectrometer. While the required materials-science foundation could not be found to utilize FTIR, a technique utilizing a graphene based super-capacitor was found as a possible alternative.

Work Experience

Jun 2022 – Current

Data Analyst, *Affinaquest*.
Working to integrate machine learning algorithms into the predictive analytics department by using large databases of client data to find patterns and predict their involvement with the company. Single-handedly built a pipeline from the group up that ingests client data, cleans and extracts features, compares machine learning models, and returns final predictions.

Teaching Experience

Sep 2021 – Jun 2022

Instructor, *Mathnasium*, Austin, TX.
Helped K-12 math students in a tailored curriculum course and one-on-one tutoring.

Aug 2021 – Jun 2022

Online Tutor, *Tutor.com*.
Worked with students in science, math, and programming with any problems on an ad-hoc basis. Rated 5 stars by students I've helped.

Aug 2019 – May 2021

Learning Assistant/Lab Instructor, *Texas State University*, San Marcos, TX.
Helped teach the intro Electricity & Magnetism and Advanced Lab courses.
- Taught the fundamentals of electronic and mechanical systems through independent projects including automated high-vacuum systems and weather stations. Students utilized Arduino micro-controllers to read multiple sensors, analyze the data, and control outputs appropriately.
- Studied the pedagogical models behind learning, and learned how to work with students to best fit their personal mental model of understanding.
- Assisted students with a wide variety of problems across many courses and levels in the physics Help Center.

Other Skills

Programming Languages
- Python
- Java
- Bash
- C++
- JavaScript
- Mathematica

Data-Science libraries
- TensorFlow
- pandas
- NumPy
- scikit-learn

Fabrication Skills
- Welding
- Water Jet
- Wood Shop
- Soldering
- CNC Mill
- Laser Cutter

References

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