

Colin Burdine

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EDUCATION

BAYLOR UNIVERSITY

Waco, TX

PHD IN ELECTRICAL AND COMPUTER ENGINEERING

Baylor University | Expected 2026
4.00 GPA | (4.0 scale)

B.S. IN COMPUTING

(Secondary Major in Mathematics)
Baylor University | May 2021
3.96 GPA | (4.0 scale)
Summa Cum Laude

BACKGROUND

COMPUTING

AI / Machine Learning
Quantum Computing
Scientific Computing
High-Performance Computing
Software Development

PHYSICS/MATHEMATICS

Quantum Mechanics
Computational Quantum Chemistry
Solid State Physics
Quantum Information Theory
Applied Mathematics and Statistics

SKILLS

PROGRAMMING

Experienced:

Python • C • C++ • Go • Java SE

Familiar:

SQL • HTML/CSS • JavaScript

SOFTWARE SYSTEMS

Experienced:

Docker • PyTorch • JAX •
Tensorflow • Numpy/Scipy •
Qiskit • QuantumESPRESSO

Familiar:

CUDA • Amazon Web Services

OPERATING SYSTEMS


Linux • UNIX • Windows

LINKS

Website: cburdine.github.io

Github: github.com/cburdine

LinkedIn: linkedin.com/colin-burdine

ORCID : 0000-0001-9699-5804

RESEARCH EXPERIENCE

BAYLOR UNIVERSITY | ELECTRICAL AND COMPUTER ENGINEERING

May 2021 – Present | Waco, TX

- Developed a symmetry-aware and quantum-informed deep learning framework for calculating the electronic structure of materials and devices with an order-of-magnitude speed-up over density functional theory methods.
- Proposed a new algorithm for efficiently simulating certain classes of open quantum systems on NISQ quantum devices. Applied this algorithm to simulate the decoherence of bosonic systems on trapped ion quantum hardware with custom error mitigation techniques. (Published two research articles in *Advanced Quantum Technologies*).
- Developed graph neural network models to identify potential conventional and unconventional superconductors from atomic structures obtained via high-throughput density functional theory calculations. (Presented paper at the 2023 IEEE International QCE Conference).

ARGONNE NATIONAL LABORATORY | RESEARCH INTERNSHIP

May 2021 – August 2021 | Lemont, IL

- Worked on the Waggle/SAGE Project, developing self-supervised and self-calibrating visual anomaly detection models for identification of wildlife, vehicles, and adverse weather events on edge computing devices.

SANDIA NATIONAL LABORATORY | RESEARCH INTERNSHIP

May 2020 – August 2020 | Livermore, CA

- Applied geometric spectral learning techniques and recurrent neural networks to predict the parameters of chaotic dynamical systems from time-series data.

TEACHING AND INDUSTRY EXPERIENCE

BAYLOR UNIVERSITY

MATERIALS + ML WORKSHOP

Summers 2023-2025 | Waco, TX

- Led a two-week course on machine learning applications in materials science. Published original course content in a free open-source online book.

GRADUATE TEACHING ASSISTANT

August 2023 – Present

- Assisted faculty in developing course materials for various engineering courses, including computational intelligence, signal processing, solid state physics, quantum mechanics, and quantum computing.
- Assisted with grading, mentoring students during office hours, and giving occasional lectures.

SUCCESS CENTER TUTORING AND LEADERSHIP TEAM

January 2017 – December 2022 | Waco, TX

- Tutored computer science courses, calculus, real analysis, and other proof-based courses in mathematics. Also led supplemental instruction sessions in computer programming, linear algebra, and other math courses.

RED VENTURES | DATA PLATFORM ENGINEERING AND DATA SCIENCE

May 2019 – August 2019 | Fort Mill, SC

- Developed and deployed a non-convex optimization software package in C++/Go to optimize a dynamic portfolio of monetary bids for placement of search engine results under finite budget constraints, raising activated search engine volume by 14%.