

DANIEL MANDRAGONA

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EDUCATION

Texas A&M University

Masters in Mathematics, GPA: 3.93

- Qualifying Exams Passed: Real Analysis and Topology/Differential Geometry.

College Station, TX

Aug 2022 – Dec 2024

University of Central Florida

BS Mathematics; Concentration in Computational Sciences, GPA: 3.71

- Honors in the Major

Orlando, FL

Aug 2013 – May 2018

Quantum Information Science Summer School

Focus on topological quantum computation, and quantum software tools.

Oak Ridge National Laboratory, TN

July 2024

WORK EXPERIENCE

Google

20% Research Engineer - Device Modeling & Optimization

Mountain View, CA

Mar 2025 – Sep 2025

- Signal processing and statistical modeling (e.g., peak-finding, Skew-Normal/GMM fitting) to identify and characterize Two-Level System (TLS) features in noisy qubit data.
- Researched adaptive TLS thresholding and created custom metrics to assess algorithm performance.
- Computer vision techniques for identifying stationary TLS features in heatmap data.
- Refined unsupervised learning algorithms through rigorous data analysis, employing statistical summaries and visualizations to enhance high-level feature understanding.

Google

Software Engineer - Certificate Authority Infrastructure

Mountain View, CA

Sep 2024 – Present & Aug 2019 – 2022

- Optimized Certificate Authority performance by diagnosing and resolving complex low-level issues, including Go/C interop bugs, database hotspot thrashing, network stack limitations (e.g., network egress), and DNS resolver latency.
- Designed and prototyped novel load balancing solutions for unique networking constraints, and implemented server migrations into highly sensitive & secure machine pools.
- Full-Lifecycle software development including implementing RFC security protocols (e.g., ACME RFC8555), building performance/integration testing frameworks, and ensuring system robustness for public release. Discovered and [reported](#) a critical DoS vulnerability in Go/Crypto's DSA implementation.
- Held on-call responsibilities, managed rollouts, triaged outages, and contributed to datacenter compliance [WebTrust](#) audits and Key Destruction Ceremonies.

Google

Software Engineer - Engineering Residency

Mountain View, CA

Sep 2018 - Aug 2019

- **Google Research - Perception:** Developed and optimized a large-scale ML pipeline, utilizing MapReduce to process billions of data points for Image Saliency Prediction. Performed hyperparameter tuning on a Resnet Unet model architecture, and implemented state-of-the-art metric functions for evaluation.
- **Android - Play Abuse:** Built multimodal ML infrastructure for Abuse Detection in the Google Play Store, decoupling feature generation from model inference.

FermiLab

Research Collaborator

College Station, TX

May 2024 – Oct 2024

- Researched quantum error correcting spherical codes for qudits, simulating them in Python using QuTiP, and benchmarking their error performance across various noise models.

Texas A&M's Department of Mathematics

Teaching Assistant

College Station, TX

Aug 2022 – Aug 2024

UCF's Department of Computer Science

Teaching Assistant for CS1

Orlando, FL

Aug 2017 – May 2018

TECHNICAL SKILLS

Course Work : Quantum Algorithms, Spectral Theory for Schrödinger Operators, Real Analysis Sequence, Probability Theory, Physics for Mathematicians, Functional Analysis, Differential Geometry Sequence, Algebra Sequence

Programming Languages : Python, C++ , Golang, Qiskit, MATLAB, C, Java, Mathematica, SQL

PRESENTATIONS

- QEC: From Classical Errors to the Surface Code** | *Quantum AI, Google* Oct 2025
- [Presented](#) fundamental classical and quantum error correction theory, starting with the Hamming Code and building up to the surface code for QEC.
- Berry Phase & Chern Numbers** | *Masters' Presentation, TAMU* Nov 2024
- [Mathematical foundations of Berry phase and Chern numbers](#), including their gauge invariance, discrete and continuous formulations, and applications in condensed matter physics. Implemented numerical methods to compute Chern numbers for topological systems, reproducing results from published research.
- Quantum Markov Chains** | *Quantum Algorithms, CSCE 640 - TAMU* Nov 2023
- [Presented](#) basic theory of Markov chains, and how the proposed Quantization scheme outlined by Szegedy leads mathematically to a quadratic speedup in convergence to the stationary distribution over the classical version. Includes a further description of the quantization of the Monte Carlo Metropolis-Hastings algorithm.
- Weyl Quantization Lecture** | *Topics in Physics for Mathematicians, MATH 689 - TAMU* Dec 2023
- [Presented](#) the mathematical theory for converting classical phase-space $L^2(\mathbb{R}^{2n})$ -observables to be self-adjoint operators on a quantum Hilbert space.
- Visual Saliency Prediction** | *Perception Research Showcase, Google* Mar 2019
- Presented the topic of image saliency and its motivations, and the ML infrastructure my team used for prediction and evaluation.
- Functional Programming** | *Engineering Residency Program, Google* Oct 2018
- Taught Engineering Residency cohort about functional programming fundamentals such as functors and monads in the context of the Haskell programming language.
- Hopf Bifurcation Analysis** | *Undergraduate Research Excellence Showcase, UCF* Apr 2018
- Conducted Hopf bifurcation research in a system of ODEs arising from a chemical reactor model. Utilized Mathematica software to perform the necessary symbolic computations for this analysis.

PUBLICATIONS

A Chaotic Chemical Reactor With and Without Delay: Bifurcations, Competitive Modes, and Amplitude Death.
S. Roy Choudhury and Daniel Mandragona. In: *Int. J. Bifurc. Chaos* (2019).