

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 <i>Quantum AI, Google</i>	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 <i>Master's Presentation, TAMU</i>	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 <i>Quantum Algorithms, CSCE 640 - TAMU</i>	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 <i>Topics in Physics for Mathematicians, MATH 689 - TAMU</i>	Dec 2023
• Presented the mathematical theory for converting classical phase-space L2(R2n)-observables to be self-adjoint operators on a quantum Hilbert space.	
Visual Saliency Prediction <i>Perception Research Showcase, Google</i>	Mar 2019
• Presented the topic of image saliency and its motivations, and the ML infrastructure my team used for prediction and evaluation.	
Functional Programming <i>Engineering Residency Program, Google</i>	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 <i>Undergraduate Research Excellence Showcase, UCF</i>	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).