

Education

2025–2029 : **PhD: Computer Science**, *University of California, San Diego*.

2021–2025 : **B.S: Computer Science, B.S: Mathematics**, *University of Washington, Seattle*, Relevant Coursework: .

- **Math:** Random matrix theory, Quantum Probability Theory, Combinatorial Optimization, Modern Algebra, Accelerated Advanced Honors Calculus, Advanced Linear Algebra
- **Computer Science:** Randomized Algorithms, Quantum Learning Theory, Markov Chains, Graduate Algorithms, Graduate Natural Language Processing, Quantum Computing, Toolkit for Modern Algorithms, Introduction to Algorithms, Complexity Theory, Machine Learning, Data Structures.

GPA : 3.94/4.0

Research experience

Publications and Pre-prints

July 2024 **Alex Albors, Hisham Bhatti, Lukshya Ganjoo, Raymond Guo, Dimitry Kunisky, Rohan Mukherjee, Alicia Stepin and Tony Zeng**, On the Structure of Bad Science Matrices, In: *arXiv preprint arXiv 2408.00933*.

In review at [Involve](#)

Ongoing research

Jun 2024 – **Approximation algorithms for solving quantum max cut**, [slides](#), (Pending arXiv submission), [Current manuscript](#).

Aug 2024

I am presently working with Professor Andrea Coladangelo and Professor Chinmay Nirkhe, where we're focused on developing approximation algorithms to find a high energy state of the QMC Hamiltonian. This Hamiltonian while serving as a generalization to the computational problem of finding a maximum cut, is also physically motivated since it models anti-ferromagnetic Hamiltonians.

Advisor : **Dr. Andrea Coladangelo**, Assistant Professor, Department of Computer Science & Engineering([Personal Web-page](#))

Advisor: **Dr. Chinmay Nirkhe**, Assistant Professor, Department of Computer Science & Engineering([Personal Web-page](#))

Talks/Reading

December 2023 **Matrix Completion via Randomized Basis Pursuit**, CSE 521: Advanced Algorithms, University of Washington: [slides](#).

March 2024 **Commutative Algebra and Algebraic Geometry**, Washington Directed Reading Program 2024, University of Washington: [slides](#).

May 2024 **Error estimates and asymptotic analysis for exact qudit universality**, Undergraduate Research Symposium 2024, University of Washington: [slides](#).

Fellowships and Awards

Fall 2025 **QuICS Lanczos Graduate Fellowship**, *UMD College Park Computer Science Department*.
Awarded based on merit to cover two-year graduate stipend (declined)

Projects

- May 2023 **SVD based word-embeddings**, *Python, pandas, NumPy*.
- Engineered a state-of-the-art word embedding solution, utilizing the top 10,000 words from a vast Wikipedia corpus of 1.5 billion words, enhancing language understanding.
 - Leveraged Singular Value Decomposition (SVD) to capture semantic and syntactic meaning within a high-dimensional vector space.
 - Utilized state-of-the-art embeddings to conduct projection analysis, unveiling syntactic relationships and showcasing a high level of proficiency in linguistic concepts.
- Nov 2022 **Image Classifier**, *Python, NumPy, Pytorch*.
- Analysed different deep learning architectures to classify images using the CIFAR-10 dataset.
 - Optimized the training process of fully connected and convolutional neural networks by designing and implementing a robust architecture using numpy and PyTorch.
 - Obtained a validation accuracy of >50% and > 65% respectively using a fully connected neural network and a convolutional neural network.
- June 2022 **Campus Paths**, *Java, Javascript, React, Node.js*.
- Displays the most optimal paths between requested locations at the University of Washington via a custom-built full-stack application.
 - Implemented a Java-directed graph, Dijkstra's algorithm, REST API endpoints, and TypeScript React user interface.
 - Redesigned project deliverables to include specific accessibility enhancements, such as visual cues and intuitive navigation; improved user engagement and satisfaction
- March 2022 **Quantum and Quantum Inspired algorithms literature review**, *LaTeX*.
- Studied a plethora of quantum algorithms in fields ranging from molecular chemistry to machine learning.
 - Analyzed the advantages of aforementioned quantum algorithms and the ways these techniques could improve pre-existing classical algorithms.
 - Investigated the differences between complexity classes; classical and quantum and their implications in complexity theory

Teaching

- Winter 2025 **TA - CSE 422: Advanced Toolkit for Modern Algorithms**, UW CSE.
- Taught an advanced undergraduate class on the principles of modern algorithms with a particular focus on machine learning algorithms.
 - Initiated weekly sections for 30+ students, grading 40+ assignments weekly and conducting office hours
- Fall 2023, 2024: **TA - CSE 534: Graduate Quantum Computing**, UW CSE.
- Taught a special topics graduate class on quantum computing and algorithms.
 - Initiated weekly sections for 20+ students, grading 100+ assignments weekly and conducting office hours
- Spring 2024, 2025: **TA - CSE 434: Introduction to Quantum Computation**, UW CSE.
- Taught a special topics undergraduate class on quantum computing and algorithms.
 - Initiated weekly sections for 30+ students, grading 100+ assignments weekly and conducting office hours

- Winter, 2024: **TA - CSE 417: Algorithms and Computational Complexity**, UW CSE.
- Taught a class on designing and analyzing algorithms and data structures, along with efficient models of computation intended for a general undergraduate audience.
 - Initiated weekly sections for 20+ students, grading 100+ assignments weekly and conducting office hours
- Spring, 2023: **TA - CSE 311: Foundations of Computing I**, UW CSE.
- Taught a class focusing on the fundamentals of logic and computation intended for a general undergraduate CS audience.
 - Initiated weekly sections for 25+ students, grading 200+ assignments weekly and conducting office hours.
- Winter, 2023: **TA - CSE 446: Introduction to Machine Learning**, UW CSE.
- Taught an introductory class on machine learning intended for an advanced undergraduate CS audience.
 - Initiated weekly sections for 15+ students, grading 100+ assignments weekly and conducting office hours.
- Fall, Summer 2022: **TA - CSE 312: Foundations of Computing II**, UW CSE.
- Taught an introductory class on probability and statistics intended for a general undergraduate CS audience.
 - Initiated weekly sections for 25+ students, grading 200+ assignments weekly and conducting office hours.

Languages and Skills

Languages Java, Python, Lean, OCaml, C++, C, Racket, Javascript, SQL, MySQL
Technologies \LaTeX , Mathematica, Git, Jupyter Notebooks, AWS, PyTorch, TensorFlow