Zackary Jorquera

Ph.D. Student at UCSC

Personal Information

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Education

09-2022 - Current **Doctor of Philosophy**, *University of California Santa Cruz*, Theoretical Computer Science
Advised by Prof. Alexandra Kolla

08-2018 - 05-2022 **Bachelor of Science in Computer Science**, *University of Colorado at Boulder*, Thesis Title: "Quantum Approximate Optimization Algorithm with Local Max-Cut", Graduated Summa Cum Laude
Minors: Double minors in Applied Mathematics and Pure Mathematics

Workshops

06-2023 - 08-2023 **Summer Cluster on Quantum Computing**, *Simons Institute for the Theory of Computing*
I attended the 2023 Summer Cluster on Quantum Computing workshop at the Simons Institute for the Theory of Computing as a visiting graduate student.

Research

09-2023 **Approximation Algorithms for Quantum Max-d-Cut**, *With: Charlie Carlson, Alexandra Kolla, Steven Kordonowy, Stuart Wayland*, In Submission 2023

04-2023 **A quantum advantage over classical for LocalMaxCut**, *With: Charlie Carlson, Alexandra Kolla, Steven Kordonowy*, In Submission 2023

08-2020 - 05-2022 **Undergraduate Thesis**, *Alexandra Kolla*, With Committee: Joshua Combes, Joshua Grochow, Steven Kordonowy
I researched quantum advantages with the Quantum Approximate Optimization Algorithm (QAOA). We looked at if a quantum computer can find locally optimal solutions to the NP-hard optimization problem, max-cut, better than classical computers.

05-2021 - 08-2021 **Software Research Assistant**, *Prof. Jed Brown*
Worked to make rust-lang bindings for the scientific computating library PETSc. This consisted of systems-level FFI Rust code. Much of which was done individually. However, future work was done after I left the project.

Teaching

Teaching Assistant, *University of California Santa Cruz*
- Computer Systems and C Programming - CSE 13S (Fall 2022)
- Introduction to Analysis of Algorithms - CSE 102 (Spring 2023)

Undergraduate Course Assistant, *University of Colorado at Boulder*

- Linear Algebra with Computer Science Applications - CSCI 2820 (Spring 2021)
- Linear Algebra with Computer Science Applications - CSCI 2820 (Fall 2020)
- Computer Systems - CSCI 2400 (Spring 2020)
- Computer Systems - CSCI 2400 (Fall 2019)

Work Experience

Summers 2019, 2020, 2022

Software Engineer Intern, *Boulder Imaging Inc.*, Computer Vision

Most recently, I worked on Computer Vision solutions assessing the quality of US bills to be used in the bill sorting machines in the US federal reserve. Previously, I worked to train neural networks to identify endangered bird in wind-farms.

Projects And Extracurricular

3rd Place Overall all for HackCU, *For HackCU VI and HackCU 007*

In a group of four, we won 3rd place for two on the HackCU events.

- **Vido (For HackCU VI)**, It's video but shorter. It takes a 20 (ish) minute video and produces a 2-minute, summarized version using a variation on the knapsack problem. We won 3rd place overall in Hack CU VI.
- **Legal-Ease (For HackCU 007)**, Summarizes and simplifies legal documents into a short and more easily readable documents using machine learning and other techniques. We won 3rd place overall in Hack CU 007.

2021 Putnam

I took the 2021 Putnam and scored a 4, which tied for third place overall at CU Boulder.

For Fun

Whitewater Kayaking

I got into whitewater kayaking during my undergrad. Since then, I have done Colorado classics such as Gore Canyon and Bailey Canyon. Both are class 5 stretches of water. In California I ran the Tobin section on the NF Feather (class IV-V-).

Skiing

I've skied my whole life in ski resorts throughout Colorado. During college, I also started backcountry skiing. Last season I did a Colorado front range classic, Dragontail Couloir. And this year I did Silvers Couloir, one of the 50 Classic descents of North America.

Skills

Programming Languages

Rust, C/C++, Python, Assembly, MatLab

General

Leadership, Teamwork, Communication, Problem Solving

Zackary Jorquera, 09/19/2023, Santa Cruz