Stuart Wayland

PhD Student | Founder | Software Developer

@ swayland@ucsc.edu
https://stuartwayland.github.io
linkedin.com/in/stuart-wayland-96b621253/

Papers and Publications

Quantum Information Processing 2023

Approximation Algorithms for Quantum Max-d-Cut

Presented Poster at the 2024 Quantum Information Processing Conference (QIP2024)

Local Hamiltonians | Quantum Max Cut | Qudits | SDPs | Rounding Algorithms

Undergraduate Thesis 2022

Quantifying Gerrymandering with Simulated Annealing

Research completed for the Department of Computer Science Distinction in the Major Program at the University of California, Santa Barbara.

Markov Chains | Physics | Statistical Application | R

Education

Present – September 2022 — **University of California, Santa Cruz**

- Pursuing a **PhD in Computer Science** in the Baskin School of Engineering at UC Santa Cruz under Professor Alexandra Kolla
- Research Areas : Local Hamiltonian Problems, Constraint Satisfaction Problems, Spectral Graph Theory, Lie Algebras, SDP Relaxations and Rounding algorithms

June 2022 – September 2018 — **University of California, Santa Barbara**

- **B.S. Mathematics**, Upper Division GPA : **3.53**
- **B.S. Computer Science**, Upper Division GPA : **3.57**
- **Minor in Music**, Overall GPA : **3.61**
- Relevant Coursework : *Markov Chains, Algorithms and Complexity, Data Structures, Application Development, Cryptography, Operating Systems, Probability and Applied Statistics, Data Science, Abstract Algebra, Number Theory, Real/Complex Analysis, Set Theory, Linear Algebra, Topography*

Professional Experience

Present – May 2023 — **Founder, Krv Analytics LLC**

- One of three founders of Krv Analytics, a startup specializing in knowledge graph generation for tabular data in the independent areas of strategizing decarbonization and analysis of rare genetic diseases in children
- Played a crucial role in the theoretical justifications and guarantees of a new method of sparse data graph generation and analysis, as well as code implementation and maintenance
- In charge of a new team planning an expansion into ESG Finance evaluation

Industry | Founder | Data Analysis | Decarbonization | Healthcare | ESG evaluation | Data driven finance | Topological Data Analysis | Manifold Learning

June 2022
April 2022

Software Developer, Alloshpere UCSB

- Developed audio software for the allolib C++ audio library responsible auditory processing in the UCSB's multimedia immersive data analysis center, the Allosphere
- Researched tonal analysis techniques for using trigonometric functions for digital representation of varying instrumentation
- Designed a C++ library for automated accompaniment of multiple instruments based on user specified theoretical musical parameters

C++ | agile | github | music theory

June 2020
January 2020

Software Developer, Undergraduate Research Project Santa Barbara CA

Application and Database Design

- Front and back-end application design and maintenance using NodeJs and SpringBoot frameworks to construct, store, and display information in data bases.
- Agile Programming Practices such as sprint planning, retrospectives, peer-programming, and user stories used to process and reflect upon user response.

Agile | Java | JavaScript | Ruby | Python | NodeJS | SpringBoot | MongoDB.

August 2020
June 2018

Software/Research Developer, Encryptek LLC Lake Forest CA

- Researching ideal regimes in which to deploy/extend their technology.
- Development of driving program to offload SHA-256 computation in cypto-mining

C++ | python | jupyter notebooks.

Academic Experience

Present
September 2022

Teaching Assistant, University of California, Santa Cruz

- Teaching assistant for undergraduate Algorithms, Discrete Math, Statistics, and C programming courses
- Designed weekly assignments to test conceptual and practical understanding of course topics
- Constructed lesson plans and presented weekly for two discussion sections of 40 students

Teaching | Math | Programming | Theory | Proofs | Statistics

June 2022
September 2021

Undergraduate Researcher/Speaker, Gerrymandering Project UCSB

- Researching applications of Markov Chain Monte Carlo techniques for evaluation of the fairness of enacted districting plans
- Attended seminars and presented on the methods and results of new techniques for analysis of voting fairness
- Worked with a group under Professor Eric Vigoda to generate algorithms for producing psuedorandom districting plans for geographic areas

R | python | java | ArcGIS

</> Programming Languages

C++	●●●●●
LateX	●●●●●
Python	●●●●●
C	●●●●○
Mathematica	●●●●○
R	●●●○○
Java	●●●○○

Skills

- Github
- Overleaf
- Team management
- Teaching/Mentoring
- Pair Programming
- Collaborative research
- Agile Software Developement

References

Professor Alexandra Kolla
Professor of Computer Science, UC Santa Cruz
@ akolla@ucsc.edu

Professor Eric Vigoda
Professor of Computer Science, UC Santa Barbara
@ vigoda@ucsb.edu