

# YANALL BOUTROS

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Chico, CA

## EDUCATION

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**University of California, Santa Cruz**

September 2016 - August 2020

- Bachelor of Science (B.S.) Physics, B.S. Computer Science. Department GPA 3.40
- Electives: Advanced Programming, AI, Computational Physics, Quantum Computing

## TECHNICAL STRENGTHS

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Python, C/C++, Unix, GNU/Linux, Scientific Communication, Mathematics, ViM, SciPy, Problem Solving, Debugging, Testing, Modeling, Statistics, Data Structures, Markov Chains, Data Visualization, Artificial Intelligence (AI), Predictive Modeling, Simulations, Tex, HTML, Selenium Web Scraping, Data Analysis, Numpy, TensorFlow, Research, Quantum Algorithms, Logic Programming, Machine Learning, Back End Engineering, Git, GitHub, Regex, Docker, Monte Carlo Simulations, Software Design, Lab Equipment, Data Validation, Matplotlib

## EXPERIENCE

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**Self Employed**

November 2020 - January 2021

*Contract Data Recovery Services*

*Chico, CA*

- Built and maintained a High Performance Computer [HPC] to brute-force attack an encrypted file
- Determined computational feasibility by deriving combinatorics from unique client information
- Brute-forced private key with custom Haskell code translated from Electrum python docs

**Santa Cruz Institute for Particle Physics**

August 2018 - August 2020

*Undergraduate Research Assistant Intern*

*Santa Cruz, CA*

- Simulated interactions in the Large Hadron Collider. Optimized code for hummingbird computer cluster
- Streamlined, benchmarked, and dockerized Python workflow and modules for simulating particle physics
- Validated data by comparing measurements to theory from Feynman Diagrams and Standard Model
- Conducted research categorizing events with Machine Learning. Written in Python 3
- Implemented feed-forward and convolution neural networks. Explored hyper-parameter study
- Trained new research assistants in Python 3, provided technical support

**Senior Projects**

August 2019 - August 2020

*Software Engineering, Computational Physics, Computer Systems*

*Santa Cruz, CA*

- Attended Scrum meetings, maintained kanban boards, practiced principles of agile development
- Hosted web app, automated web scraping and data delivery, debugged front end in JavaScript
- Created 2D Ising model Monte Carlo simulation as an NxN lattice of spin-up/spin-down particles
- Animated and demonstrated quantitatively and qualitatively at what  $k_bT$  a phase transition occurred
- Simulated, animated thermodynamics of inlet heat flow to cooled needle in Python 3
- Simulated pressure drop and airflow in thin gap region of an FN-99 mask in Python 3
- Wrote multithreaded http server and load balancer in C using file descriptors. Maintained design docs
- Remade unix filesystem shell language in C++. Made programming languages from Scheme, OCaml

## REFERENCES

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References include professors I have worked or researched with and will be provided upon request