David Hacker

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Education

- **University of California San Diego** — **La Jolla**
  Major: Computer Science, Minor: Mathematics, 4.0 — *2017–2021*

Work Experience

Positions Held

- **University of California San Diego** — **La Jolla**
  CSE Department Tutor — *April 2018–Present*
  - Served as a tutor for CSE 20 (Discrete Mathematics) under Professor Daniele Micciancio
  - Held office hours on a weekly basis and provided tutoring to students who required additional help
  - Graded students' homework assignments, midterms and final exams

- **Medspace** — **La Jolla**
  Software Engineering Intern — *Oct 2017–April 2018*
  - Wrote a command line tool in C# to import 166 million rows of CSV data into a Neo4j graph database
  - Created an ASP.NET Core backend & RESTful API to interface with the database
  - Implemented an k-dimensional tree in the backend to speed up geospatial queries by a factor of several hundred
  - Managed nearly $20,000 worth of server resources, used to store data and host the backend
  - Designed a tool to extract physician LinkedIn connections from the profiles of healthcare consultants

Notable Projects

- **Alexa YouTube Skill:** *NodeJS, AWS Lambda, Heroku, FFmpeg*
  - Created a skill that lets Amazon Alexa devices play audio from YouTube videos
  - Downloaded over 2000 times and has over 80 stars on GitHub
  - Reviewed by the German tech channel Venix, which has over 10,000 subscribers
- **Decentralized Email:** *NodeJS, Webpack, JQuery, Truffle, Ganache*
  - Used the Ethereum blockchain as a means to store encrypted messages of variable length
  - Integrated AES & RSA cryptosystems to ensure that messages could be transmitted between users safely
  - Worked on a team with three others to design the application and attended weekly review sessions to discuss progress
- **Parallel Rainbow Tables:** *Rust, Crossbeam, Serde*
  - Developed a fast & parallel implementation of rainbow tables, which are used in cryptanalysis to reverse hashes
  - Able to iterate through nearly 1 million MD5 hashes in under a millisecond using only the CPU
  - Exposed a clean API that makes it easy for other developers to crack different hashing functions
- **Graphical GDB:** *C++, GNU Readline, wxWidgets*
  - Created a visualization tool for the GNU Debugger (GDB) utility present on most Linux machines
  - Collects information about and displays your debugging program's current state, registers, variables, stack, etc.
  - Designed it for use in UCSD's CSE 30 class, specifically for analysis of ARM assembly code

Technical Skills

- **Languages:** Java, Python, JavaScript, C, C++, C#, Rust, Solidity, ARM Assembly
- **Frameworks:** MEAN stack, Flask, ASP.NET Core, Materialize, React Native
- **Databases:** MongoDB, Neo4j, Redis, Firebase, MySQL