David Hacker

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Education

- **University of California San Diego** — **La Jolla**
  B.S. Computer Science, 3.93 — *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 (Introduction to Discrete Mathematics) under Professor Daniele Micciancio
  - Provided tutoring to individual students or small groups of students who required additional help
  - Facilitated small group discussions and held office hours on a weekly basis

- **Medspace** — **La Jolla**
  Software Engineering Intern — *Oct 2017–Present*
  - Developed a tester application using Xamarin Forms that tracked team member locations
  - Wrote a command line tool in C# to import 166 million rows of CSV data into a Neo4j graph database
  - Created a RESTful API & corresponding backend using the ASP.NET Core web framework
  - Implemented an R-tree in the backend to speed up geospatial queries by a factor of several hundred

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 1000 times and has over 50 stars on GitHub
  - Reviewed by the German tech channel Venix, which has over 10,000 subscribers
- **Dmail:** *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 CPU power
  - Exposed a clean API that makes it easy for other developers to crack different hashing functions
- **Photorealistic Rendering Engine:** *Java, Swing*
  - Created a ray tracer that can show light refraction and reflection
  - Detected ray-object collisions quickly using a k-dimensional tree structure
  - Ran several threads in parallel to to speed up image generation

Technical Skills

- **Languages:** Java, Python, JavaScript, C#, C++, C, Rust, Solidity, LaTeX
- **Frameworks:** MEAN stack, Flask, ASP.NET Core, Materialize, React Native, Xamarin Forms
- **Databases:** MongoDB, Neo4j, Redis, Firebase, MySQL
- **Design Patterns:** MVVM, MVC, Strategy, Singleton, Repository