

## Joe Rickard

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### PROJECTS

**Linear Algebra Library:** Over July/August of 2016, I wrote a C++ library to complete linear algebra functions for data analysis. While many already exist, I used this as an opportunity to further cement my understanding of the maths. With this Library I can take CSV inputs from a data set and end with node coordinates for use with the clustering algorithm of your choice. This allows a user to more easily visualize data similarity and distribution with a front end library such as D3.

**Neural Networks:** In 2016 I implemented the N.E.A.T. genetic machine learning algorithm whitepaper in C++. This was a good gateway for me to understand the delicate process of tuning a network, albeit an outdated design. Since then I have used NLTK for a number of projects, harnessing a convolutional network for semantic analysis of text. I used this library to achieve a second place award at HackCU 2016.

**SQL Query Work:** I've done freelance SQL Query production for a Boulder start-up aiding their new version release. This included writing new queries, updating old queries, and optimizing much of the existing code. This was done in MySQL. Since then, I have taken specialized courses in database design and optimization. The combination of these two have given me the skillset to confidently design a database from the ground up, or update a database to better meet current needs.

**HackCU:** I have attended 2 on-campus hackathons. At my first in 2017, I developed an interface for semantic analysis of social media posts relating to some user defined topic. The UI, written in D3, would then show an overall public temperature, and show the distribution of opinions. My team was awarded second place for this effort. This year I developed a large database of Colorado voter information, and a number of queries for relevant statistics. I am still working on this project.

### COMPUTER SKILLS

**Languages:** C, C++, C#, Python, Bash, SQL, x86 Assembly  
**Github:** /joerickard

### EXPERIENCE

**Front-End Performance Work** The Trade Desk  
5/17-8/17 Boulder CO

At the trade desk I worked on their embedded pixel for customers sites, ensuring reasonably fast load times regardless of partner server outages. This work required extreme attention to edge case handling, as most of the errors my code resolved stemmed from rare conflicts with partner servers.

**BLE and Language Model development** Toys2Life  
10/16-6/17 Boulder CO

I spent time working on an existing C# code base. This involved significant re-factoring and creation of new functionality. The product is custom BLE firmware, leveraged to gather relative location data of radios in our network. On top of this I developed language models to give nodes the ability to have contextually driven conversations with each other. I also developed some internal testing and development tools, as well as a graphical UI for internal content creation. These were also in C#.

### EDUCATION

**University of Colorado**, Boulder, CO  
*Seeking Bachelors:* Computer Science and Mathematics, expected Dec 2019  
*Notable Courses:* Performant Linear Algebra, Computational Linear Algebra, Concurrent Programming, Data Analysis Algorithms, Database Systems