# Hashem Elezabi

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## Education

### Stanford University
*Stanford, CA*

B.S. in Computer Science (Minor in Mathematics) *Class of 2021*

**Coursework:** *Deep Learning, Modern Algorithms, Massive Data Mining, AI Principles and Techniques, Design and Analysis of Algorithms, Data Structures (Advanced), Database Systems, Principles of Computer Systems, Probability and Statistics, Linear Algebra and Matrix Theory*

## Experience

### Stanford CS106A Code in Place
*Remote (Online)*

Volunteer Section Leader *Apr 2020 - May 2020*

- *Accepted as a volunteer section leader in Code in Place, Stanford's first free online offering of CS106A during the COVID-19 pandemic.*
- *Part of worldwide team introducing Python to >10,000 students from >65 countries. Led a section of 11 students from 4 different continents.*

### Passed Plates
*San Francisco, CA*

Co-Founder *Jun 2019 - Apr 2020*

- *Passed Plates fights food waste by enabling food vendors to sell their surplus food to consumers at a discounted price.*
- *Built front-end of the Passed Plates mobile app in React Native with Expo, Redux, and the latest JavaScript.*
- *Implemented complex UIs for both consumers and businesses, and connected app to a Django API on top of a PostgreSQL database.*

### SLAC National Accelerator Lab
*Menlo Park, CA*

Undergraduate Researcher *Jun 2018 - Aug 2018*

- *Studied the space charge limited (SCL) emission phenomenon in high-power devices.*
- *Implemented algorithms in Mathematica and C++ for efficiently approximating the SCL in complex device geometries.*

### Stanford Future Data Systems Lab
*Stanford, CA*

Undergraduate Researcher *Jun 2017 - May 2018*

- *Developed parallel Python code for efficiently processing large (>1TB) binary data encoding seismic time series data.*
- *Studied locality-sensitive hashing (LSH) for efficient near-neighbor search in high-dimensional data, applied to micro-earthquake detection.*
- *Benchmarked our C++ MinHash LSH implementation against existing LSH libraries.*

## Projects

### Finding most popular Hacker News topics
- *Used SQL, BigQuery, and Google's Natural Language API to mine and analyze millions of Hacker News posts and comments to find most popular topics*
- *Built a linear regression model to predict how many upvotes a post has*

### R-trees (team)
- *Studied the R-tree spatial index, an extension of the B-tree for multidimensional data*
- *Implemented an algorithm designed for fast updates on top of `rbush`, an efficient JavaScript R-tree library, and evaluated its performance*

### Quantum clustering algorithm
- *Implemented in Python a clustering algorithm that applies the Quantum Approximate Optimization Algorithm (QAOA) to weighted MAX-CUT*
- *Used Rigetti Computing's API and published code and explanation in a Jupyter Notebook*

### CS + Social Good / Streetcode (team)
- *Selected as part of a team working with Streetcode, a nonprofit offering tech classes to underprivileged communities in East Palo Alto*
- *Contributed to Nibbly, a web platform for sharing 'nibbles' of tailored CS teaching content to help mentors teach workshops more efficiently*

## Selected Publications

- ***Unsupervised Large-Scale Search for Similar Earthquake Signals.*** *Bulletin of the Seismological Society of America (2019).* Clara Yoon, Karianne Bergen, Kexin Rong, **Hashem Elezabi**, William Ellsworth, Gregory Beroza, Peter Bailis, Philip Levis.
- ***Locality-Sensitive Hashing for Earthquake Detection: A Case Study of Scaling Data-Driven Science.*** *Very Large Data Bases (2018).* Kexin Rong, Clara Yoon, Karianne Bergen, **Hashem Elezabi**, Peter Bailis, Philip Levis, Gregory Beroza

## Skills

**Languages** Python, C/C++, JavaScript, Java, SQL, HTML, CSS, LaTeX

**Tools** Git, Apache Spark, Hadoop, Google BigQuery, numpy, tensorflow, pandas, sklearn, Matlab, React / React Native, Unity