Hashem Elezabi

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Education

Stanford University
Stanford, CA

B.S.H. in Electrical Engineering (GPA: 3.71) *Expected Fall 2021*
(with Secondary Major in Computer Science + Minor in Mathematics)

Coursework: *Machine Learning, Deep Learning, Modern Algorithms, Massive Data Mining, Parallel Computing, Natural Language Understanding, Data Structures (Advanced), Database Systems, Principles of Computer Systems, Probability and Statistics, Linear Algebra and Matrix Theory*

Experience

Pervasive Parallelism Lab *(ppl.stanford.edu)*
Stanford, CA

Undergraduate Researcher *Sep 2020 - Present*

- Performing honors thesis research with Tian Zhao and Professor Kunle Olukotun (known as the "father of the multi-core processor").
- Working on a new language and framework for generating **efficient CUDA kernels from Python code to accelerate deep learning workloads.**

Gridspace *(gridspace.com)*
Los Angeles, CA

Machine Learning Engineer Intern *Jun 2020 - Sep 2020*

- Gridspace builds AI tools for analyzing real-time conversational speech.
- Built generative deep learning models for real-time audio denoising and noise measurement in contact center telephony streams.
- Worked with Docker containers in Gridspace's Kubernetes cluster, **one of the largest Google Kubernetes clusters in the world.**

Passed Plates *(passedplates.com)*
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.
- Led app front-end development (React Native, Expo) and **implemented complex UIs for both consumers and businesses.**

Stanford Future Data Systems Lab *(futuredata.stanford.edu)*
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, and **co-authored a conference paper at a top conference.**

Projects

Finding most popular Hacker News topics

- Used SQL, BigQuery, and Google's Natural Language API to mine millions of Hacker News posts and comments to find most popular topics.

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 (github.com/hashemelezabi/phys14n-project)

Teaching

Stanford CS106A Code in Place
Apr 2020 - May 2020

- Part of worldwide teaching team in Stanford's first free online offering of CS106A during COVID-19, **with >10,000 students from >65 countries.**

CS + Social Good and Streetcode (team)
Jan 2017 - Jun 2017

- Worked with nonprofit Streetcode via the CS + Social Good club on building a **web platform for improving delivery of CS teaching content.**

Selected Publications

- *(VLDB '18)* **Locality-Sensitive Hashing for Earthquake Detection: A Case Study of Scaling Data-Driven Science.** (bit.ly/34fCIgT)
  Kexin Rong, Clara Yoon, Karianne Bergen, **Hashem Elezabi**, Peter Bailis, Philip Levis, Gregory Beroza.
- *(IEEE IPDPSW '16)* **PGAS Access Overhead Characterization in Chapel.** (bit.ly/30pieRr)
  Engin Kayraklioglu, Olivier Serres, Ahmad Anbar, **Hashem Elezabi**, Tarek El-Ghazawi.

Skills

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

Tools Git, TensorFlow, TensorBoard, NumPy, Google Colab, Apache Spark, Google BigQuery, Pandas, scikit-learn, Docker, Kubernetes, Hadoop, MapReduce, Parallel Computing, Matlab, React + React Native, UI/UX, Unity