



# Hammad Afzal

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## EDUCATION

University of California, Berkeley, CA

Berkeley, USA

**Bachelor of Science, Electrical Engineering and Computer Science (EECS)**

Expected Graduation: May 2023

**Relevant Coursework:** Software Engineering, Data Structures, Computer Architecture, Databases, Discrete Math, Linear Algebra, Designing Information and Systems, Foundation, Principle and Techniques of Data Science, Algorithms, UI/UX Design

## TECHNICAL SKILLS

**Proficient Languages:** Java | Python | C | Ruby | RISC V | VB.Net | SQL | HTML5 | CSS3 | PHP | JavaScript

**Relevant SWE Frameworks:** Rails | Node.js | Bootstrap | Maven | MongoDB | Heroku | Spark | Nokogiri | jQuery

## PROFESSIONAL EXPERIENCE

**LESCO**, *Software Engineering Intern*

Lahore, Pakistan | Jun-Aug 2022

- Implemented CIBS (Customer Information Billing System) by customizing open source COMPIERE (ERP and CRM) server based on Java that uses snapshots of electric meters resulting in error-free measurements to reduce **80%** of over-billing for **5.8 million** consumers
- Monitored implementation of HR & Admin modules - transitioned from COBOL base legacy system to Oracle DB based CIBS - overseeing data entry, integration, processing, analysis, and troubleshooting, resulting in the centralization of paper-less data, being less labor-intensive, saving both time, energy and being much more eco-friendly in the process

**Ibex Global**, *Information Database Administration Intern*

Washington DC | Jun-Aug 2021

- Met pre-established deadlines for data analysis and timely reporting of sales & performance-based metrics by assisting developers in writing complex SQL queries and procedures, creating business cases that increased product sales by **20%**
- Recommended and explained the management of statistical techniques and principals that resulted in a **18.5%** reduction in the cancellation rate of services

## PROJECTS

**AgileIterations** (Ruby, HTML, JavaScript, Node.js, SQLite3, PostgreSQL, npm, yarn, Nokogiri, Topojson)

- Developed a responsive app using Codio IDE and deployed on Heroku that allows users to learn more about their representatives, political events in their area as well as aggregate, share and view news items in their locality
- Created stories using BDD and integrated Google Civic API to get the keys into apps's production environment.
- Ran migrations to prepare a local host database to store and serve data, further seeded the database with a list of states in the US

**RookieDB** (Java)

- Designed our very own relational database management system by implementing block nested loop join, sort operator, sort merge, and grace hash join, and a limited version of Selinger optimization
- For concurrency, divided multigranularity (enforcing the availability of appropriate intent locks before acquiring or performing lock escalation) locking into three layers: Lock Manager, the middle layer (Lock Context), and the declarative layer (LockUtil) and integrated the changes into the database
- For recovery, implemented write-ahead logging and support for savepoints, rollbacks, and ACID compliant restart recovery

**Movie Classification** (iPython Jupyter Notebook)

- Wrote a single function that encapsulates the whole process of a k-nearest-neighbors classifier that guesses whether a movie is a comedy or a thriller, using only the number of times specific words appear in the movie's screenplay
- Imported numpy and matplotlib libraries to generate histograms for comparison using statistical values
- Computed the p-value for our hypothesis test and used bootstrap to construct a **95%** confidence interval for the prediction based on linear regression to predict averages
- Made a function of weighted root mean square error using slope and intercept for a prediction line to find associations

**BYoW: 2D Tile Based Interactive Game** (Java)

- Designed and implemented a tile-based world exploration engine. The software allows user to interact with objects using arrow keys of keyboard and pseudorandomly generates a new world of explorable rooms and hallways each time it is played using StdDraw class
- Integrated features such as displaying information including cursor position, player names, sound effects, and random theme generation for the game world

**Clasify** (RISC V)

- Wrote all assembly code necessary to run a simple Artificial Neural Network (ANN) on the Venus RISC-V simulator
- Implemented the combined functions such as a vector dot product, matrix-matrix multiplication, argmax, and activation function to load a pretrained network and execute it to classify handwritten digits from the MNIST benchmark set

**Numc** (C)

- Implemented a slower version of numpy; applied SIMD (Single Instruction Multiple Data) instructions to improve performance and make our defined instance methods for numc.Matrix object's operations faster. Additionally, used two hyperthreads and OpenMP API to parallelize computation