CHARLES BOLTON
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EDUCATION:

2020:   **Master of Science in Computer Science**
Portland State University (Portland, OR)

2018:   Accelerated Undergraduate **Computer Science**
Portland State University (Portland, OR)

2017:   Sonic Arts/Audio Engineering
Portland Community College (Portland, OR)

2015:   Post-Baccalaureate Inquiry World History, Politics, Economics
Portland State University (Portland, OR)

2014:   **Mandarin Chinese** HSK 5 and Advanced Oral HSK Certification
Confucius Institute/Hanban (Portland, OR)

2005-2009:   Bachelor of Arts in **English Literature**
Portland State University (Portland, OR)
ESL Certification (Portland, OR)

PROJECTS:

AI:

Projects include: Euphonomimesis, an experiment involving FFT and genetic algorithms, for determining whether a GA can mimic audio samples. Other AI projects: a puzzle-solver comparing A* with several heuristics and the 8-queens puzzle using genetic algorithms.

ML:

Projects include: NBA success prediction: recreation of a paper from students at SMU. A team project comparing four different ML models for predicting NBA player success using SVM, Regression, Naive Bayes and Random Forest. Other ML projects: Comparing simple perceptron model to multilayer perceptron using MNIST handwritten digits data. Predicting spam email using probabilistic Bayesian and logistic regression models. Unsupervised K-means clustering on random data.

Fullstack Trivia App:

Fullstack application using embedded postgreSQL, Javascript, HTML/CSS and Bootstrap. Made API calls to a database of trivia questions and presented them to users in game.

Markov Chains in Haskell:

Two projects using Markov chains and functional programming in Haskell to generate text (based on authors like Joyce, Woolf, etc) and MIDI (based on classical keyboard music like Bach, etc).

Cryptographic Protocols:

Three projects: Twofish-like cryptographic protocol using a Feistel structure and other symmetric methods. Elgamal asymmetric key exchange and encryption scheme using square multiply and Miller-Rabin primality test. Graduate lecture on elliptic curve cryptography and ECC Diffie-Hellman key-exchange.

Countries Database:

Created a small relational database and corresponding embedded-SQL application with countries of the world data related to statistics such as human rights, wealth and income, etc. Used postgreSQL, pandas, sqlalchemy and psycopg2 in toy app which iteratively built up sql query strings based on user input.

MIT Battlecode:

Software Engineering project using MIT's battlecode as background. Was project manager for a small team of engineers using an agile-like sprint process with the goal of building a complicated Java program to compete in the battlecode robot competition, an annual exercise in developing features for a multithreaded interface.

Digital Signal Processing & Ear Trainer:

Exploration into the physical foundations of music, digital signal processing, and waveform generation, composition, and decomposition. Created over 5000 .wav files of sine, square, saw, and triangle waves, and combined them in many musical ways, then wrote a Discrete Fourier Transform which listened to the combined waves and decomposed them. Made a game/practice tool for audio engineers and musicians.

Candidate Solutions for Post-Quantum Cryptography:

Group research paper investigating some interesting topics related to cryptographic solutions and cryptosystems for the next era of cryptography such as dihedral coset/hidden subgroup problem vis a vis lattice crypto, supersingular isogenies and code theory.

RESTful API and Spreadsheet Parser:

Project completed as capstone for PSU. Internship with ecommerce consulting company The Good. Worked with a strategist and two software developers over the course of five months. Data wrangling from spreadsheets to REST API using pandas, flask, json, postman.

Networking & TCP IRC Chatroom:

Experiment in internetworking protocols; an asynchronous client/server (python's asyncio) chat application which supports multiple clients, chat room creation, deletion, joining, switching, leaving, broadcasting, as well as other functions relating to connections and disconnections. Two-person student project.

SFTP Client:

SFTP client written in Java as an exercise in Java Networking using Agile (XP) software development as a guiding process. Team of six engineers developing application for secure file transfer protocol with numerous functions.

Appointment Manager:

8-week, iterative/evolving project focused on developing Android application for managing appointments. Included 6 projects focused on test-driven development and OOP; culminated in fully-functional Android application which resembled Wunderlist.

CS COURSES:

Calculus I II
Linear Algebra
Statistics
Programming & Problem-Solving
Systems Programming
Data Structures
Discrete Structures
Software Engineering
Operating Systems
Algorithms, Complexity, Design & Analysis
Music, Sound, Filters and Digital Signal Processing
Internet and Networking Protocols
Programming In Java
Sofware Engineering
Agile Software Development
Numerical Computation
Full-Stack Web Development
Front-End Technologies
Theory of Computation
Database Management
Quantum Computing
Machine Learning
Artificial Intelligence
Functional Programming
Cryptography

CS COMPETENCIES:

Programming: C, C++, Python, Haskell, Java, Javascript, SQL
Other: HTML, CSS, Latex, Pandas, Jupyter, Excel, JSON, JUnit
Tools: Matplotlib, Postman, Flask, Git, Heroku, Travis

EMPLOYMENT:

2019-2020:   Portland State University
                   Graduate Teaching Assistant

2007-2018:   Townshend's Tea (Portland, OR)
                   Server/Barista/Customer Service/Warehouse Management

Memorized, mixed, made and served over 150 kinds of tea in a chaotic, busy environment. Brewed, bottled, kegged and labelled, and distributed kombucha. Handled cash, maintained and operated business. Managed warehouse, inventory, purchases, delivered tea, etc.

2016 Summer   Andeo Homestays (Portland, OR)
                    ESL Teacher

Created curriculum, instructed daily 80 min. classes, participated in daily field trips with students, organized activities, drove vehicle, etc.

2015-2016   Private Mandarin Teacher (Portland, OR)

Taught Mandarin Chinese to two brothers, ages 7 and 12, including HSK prep, listening, reading and writing. Educated in various other subjects: Math, History, Science, Social Studies, Physical Education (in Mandarin Chinese). Used Connections Academy online homeschooling curriculum.

2014:   METEN English (Chongqing, China)
                     ESL Teacher

Taught 6-8 60-minute classes a day to teens and adults, ages 12-50. Required to adjust to various competency levels throughout the day, often taught new students/lessons. Followed many different textbooks and often needed to invent lesson plans without notice. Taught and created lessons on different topics.

2010-2011:   Expertise Education (Beijing, China)
                     Kindergarten ESL Teacher

Taught English to children, ages 3-6. Took care of children (fed, put to bed, ensured safety, etc.) Prepared lessons, art/science projects, organized performances/holiday galas. Led a team of four teachers.

OTHER WORK:

TUTORING: Was ESL tutor to many students of various ages in China, USA, and Japan for approximately three years.

TRANSLATION: Translated Mandarin Chinese to English for various clients for six months. Volunteered as interpreter and guide for artist in Chongqing, China for four months.

EDITING: Edited two full-length books and have edited several research papers including a large research project on education in Oregon.

AUDIO: Completed a 6-month audio engineering apprenticeship in the fall/winter of 2015-16 at Ice Cream Party Studios (Portland, OR).

OTHER SKILLS:

Natural Languages: English, Chinese, Spanish
Interests: Music, History, World, Art, Math, Economics, Writing, Philosophy

GRANTS/HONORS:

Idaho Falls High School: Summa Cum Laude
Idaho Top Scholar 2005 recipient
Confucius Institute: Scholarship for 1 year study in China (2014)