ReDay de Armas Zarra

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Skills

- Python | Typescript | Javascript | R | C++ | Cirq | SQL | MATLAB | Tensorflow | Git | MongoDB | Express.js | React | Angular | Node.js
- Bootstrap | Material-UI | TailwindCSS | HTML | CSS | Axios | Flask | React Native | Pandas | Sci-kit Learn | Matplotlib | .NET | Unity 3D
- Data Science | Machine Learning | Frontend | Backend | Full-Stack | Quantum Computing | English, Spanish, Korean – *Order of proficiency*

Experience

Open Source Project (GitHub, Demo) **Athena: Learning Platform** **10/2023 - 12/2023**

• Developed a **full-stack** online learning platform using Next.js 14, React, **TypeScript**, and **MySQL** . Implemented features such as course creation and management, an interactive learning dashboard, and a dynamic course catalog with seamless course purchase and enrollment.
• Integrated **Stripe** for payment processing, **Mux** for video streaming, and MySQL for data storage. Enabled users to personalize their courses with high-quality video, detailed course chapters, in-depth course descriptions and any attachment of supplementary materials

Coding Competition (Challenge, GitHub) **KnightVision: Chess Bot** **08/2023 - 10/2023**

• Developing a chess bot using **bitboard representations** and **Zobrist hashing**, optimizing move generation and state evaluations. Using iterative deepening and **alpha-beta pruning** in the search algorithm, enhanced with **quiescence search** to counteract the horizon effect.
• Integrating adaptive strategies to dynamically **counteract opponent gameplay** patterns, using **.NET 6.0 framework**. Leveraging the given competition-specific API to optimize algorithms and data storage to ensure memory efficiency within a strict **256mb constraint.**

Open Source Google - (GitHub - PR) **TensorFlow Quantum - Parallelization** **07/2023 - 07/2023**

• Integrated **parallel processing** to the TensorFlow Quantum library by refactoring the 'convert_to_tensor' function, thereby enabling **concurrent conversion** of Cirq's PauliSum and Circuit objects into TensorFlow's Tensor, thus **improving efficiency and processing speed**.
• Utilized Python's multiprocessing module to **independently process each item** in the conversion list, effectively **enhancing CPU performance** for large quantum circuit datasets, which are serialized using Cirq's serialization methods for Circuit and PauliSum objects.

Open Source Project (GitHub, Video) **AutoPilot - Drone Control System** **05/2023 - 06/2023**

• Engineered a web-based drone control system interfacing with the Tello EDU Drone SDK, featuring a **React frontend** for user-friendly controls and a custom **Flask backend API** for handling flight operations. Translated drone commands into keyboard inputs for operations.
• Integrated **OpenCV** to equip the drone with real-time **facial recognition** abilities, viewable directly on the **live video stream** in the application interface. Expanded Tello EDU drone capabilities by merging **computer vision** technologies with web-based control systems.

Capstone - UMass Medical School (GitHub) **Sleep Apnea Detection** **09/2022 - 04/2023**

• Devised a personalized **home monitoring system** as a capstone project sponsored by UMass Medical School to **enhance treatment for sleep apnea** patients by analyzing environmental data and breathing patterns. Optimizing patient care and providing valuable medical data
• Utilized machine learning and IoT with an **Arduino Nano 33 BLE Sense** and **Raspberry Pi 3** as the data hub. Used TinyML for keyword recognition with **94% test accuracy** and processed environmental and auditory data via MongoDB for in-depth patient condition analysis.

Education

University of Massachusetts Lowell - Lowell, MA: **Expected in 12/2023**
Bachelor of Science: **Biomedical Engineering** — Relevant Coursework: BME Programming ◦ Biology ◦ Organic Chemistry ◦ Bioinstruments ◦ Biomaterials ◦ Biomechanics ◦ Quantitative Physiology ◦ Calculus (1, 2, 3) ◦ Medical Device Design ◦ Statistics ◦ Differential Equations

Massachusetts Institute of Technology - Cambridge, MA **Expected in 01/2024**
MicroMasters Program: **Statistics and Data Science** — Relevant Coursework: Computer Science & Programming ◦ Computational Thinking & Data Science ◦ Machine Learning with Python ◦ Data Science for Healthcare ◦ Probability: Uncertainty and Data ◦ Fundamentals of Statistics

Harvard University - Cambridge, MA **Expected in 01/2024**
Professional Certificates: **Artificial Intelligence & Web Programming** — Relevant Coursework: Professional TinyML Program (3 Certificates) Fundamentals of TinyML ◦ Applications of TinyML ◦ Deploying TinyML ◦ Data Science: R Basics ◦ Web Programming with Python & JS

Certificates

Google Cloud - Machine Learning Engineer Path **In Progress**
Courses: Machine Learning on Google Cloud ◦ Tensorflow on Google Cloud ◦ Feature Engineering ◦ Production Machine Learning Systems

Google: Advanced Data Analytics (Certificate) - Coursera **Completed**
Courses: Translate Data into Insights ◦ Foundations of Data Science ◦ Python ◦ Power of Statistics ◦ Regression Analysis ◦ Machine Learning

React 18 + Typescript (GitHub, Certificate) & React Native (GitHub, Certificate) - Code with Mosh **Completed**
Courses: React Native: Fundamentals ◦ React Native: Advanced Concepts ◦ React 18 for Beginners ◦ React 18: Intermediate Topics