Matthew Ernst

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Experience

Software Engineer, Machine Learning May 2022 - Present
Qualcomm, Machine Learning Group - AIMET Team *San Diego, CA*

- Actively contributing to the development of the AI Model Efficiency Toolkit (AIMET), an open-source library focused on implementing advanced quantization and compression techniques for trained neural network models, enhancing their efficiency and deployment feasibility.
- Collaborated closely with cross-functional teams within the machine learning group to design, develop, and release user-friendly SDKs on a monthly basis, streamlining the integration of AIMET functionalities into existing workflows and ensuring a seamless user experience.
- Translating client requirements into actionable plans, offering professional recommendations on leveraging AIMET capabilities to optimize model efficiency, improve performance, and address their specific challenges.

Instructor - Introduction To C++ Programming June 2021 – August 2021
Front Range Community College, Department of Computer Science *Fort Collins, CO*

- Developed new course designs with a focus on hands-on programming through classwork and projects .
- Brought software engineering technologies into the course, introducing Git, GitHub, and testing tools.
- Fostered learning through multi-week project designing a raytracing engine, showing the capabilities of C++ and giving students a meaningful way to connect to the course.

Projects

Mountain UI (Electron App) / Mountain UI Companion App (iOS App) December 2022 – Present

- Developed an Electron app, Mountain UI, that enhances the skiing experience bxy providing real-time updates of lifts and trails at ski resorts, including weather forecasts and live cams, resulting in a seamless and enjoyable user experience.
- Implemented a Lambda function to calculate leaderboard results, ensuring accurate and timely display of users' top speed, most runs, and other achievements, enhancing the competitive aspect of the skiing community.
- Developed an iOS app using UIKit, integrating with users ski apps, to offer users a companion experience to the Mountain UI app, showcasing their personal skiing stats and allowing them to analyze their speed, distance, elevation, and more, promoting self-improvement.

Chord - A Peer to Peer System September 2021 – December 2021

- Successfully created and implemented a distributed system in Python, leveraging the Chord protocol to ensure equal workloads and efficient data partitioning across the network.
- Designed and implemented a hashable 16-bit ID space, enabling the accurate storage and retrieval of up to 64,000 peers and keys within the Chord ring, ensuring scalability and optimal performance.

Education

Masters of Science in Computer Science December 2021
Colorado State University, GPA: 4.0 *Fort Collins, CO*
Research: Sparse Reconfigurable Artificial Neural Systems *May 2021 – May 2022*

- Researched the underlying structure of ReLU networks and the presence of dead neurons from vanishing gradients.
- Implemented new neural network architecture to mitigate dead neurons named a "Late Residual Neural Network."
- Investigated correlations between learning rates and optimizers to an increased quantity of dead neurons.

Technical Qualifications

Languages: Python, C++, Swift, Java, JavaScript, Objective-C, C, Rust
Frameworks / Libraries: PyTorch, TensorFlow(1/2), ONNX, UIKit, SwiftUI, GraphQL, OpenCV, PyBind, Node, React, Electron, Apollo, Vite, Webpack, Jest, JUnit, Maven, Gradle, MongoDB
Tools: Linux, Git, Scrum, Docker, Postman, Jenkins, GCP, AWS, Azure, JetBrains, Visual Studio, Serverless
Engineering Principles: Agile Development, Object Oriented Programming, Cloud Computing, Test Driven Development, Unit Testing, Coverage Testing, Continuous Integration/Deployment