

Matthew Ernst

| 970-214-5508 | matthew.f.ernst@gmail.com | matthewf Ernst .com |
| linkedin.com/in/matthew-f-ernst | github.com/matthewf Ernst |

EDUCATION

Masters of Science in Computer Science

Colorado State University GPA: 4.0

December 2021

Fort Collins, CO

Bachelor of Science in Biological Systems Engineering

Iowa State University

December 2018

Ames, IA

EXPERIENCE

Software Engineer, Machine Learning

Qualcomm, Machine Learning Group - AIMET Tools Team

April 2022 - Present

San Diego, CA

- Contributing to the AI Model Efficiency Toolkit (AIMET), an open source library for advanced quantization and compression techniques for trained neural network models.
- Collaborating with cross functional teams within the machine learning group to create user-friendly SDKs and ensure a robust testing pipeline to make developing easier and results accurate for on target performance.
- Developing professional solutions for clients to facilitate specific use cases integrated with the AIMET library.

Instructor - Introduction To C++ Programming

Front Range Community College, Department of Computer Science

June 2021 – August 2021

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.

RESEARCH

Sparse Reconfigurable Artificial Neural Systems

Dead ReLU Problem, Vanishing Gradient, Late Residual Neural Network

May 2021 – Present

Advisor: Dr. Darrell Whitley

- 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.
- Explored activation functions such as variations of PLU and Hard Sigmoid to improve deep learning.

PROJECTS

Chord - A Peer to Peer System

September 2021 – December 2021

- Created a Python distributed system under Chord protocol for equal workloads and data partitioning.
- Generated a hashable 16-bit ID space to accurately store up to 64,000 peers and keys in a given ring.
- Built a robust system that will converge a given query in a worst-case scenario of $\log(n)$ hops away.

Ideal Traffic Sign Images Classification For Convolutional Neural Networks

January 2021 – May 2021

- Investigated advanced CNN’s such as VGG16 to see ideal images for input for specific traffic sign classifications.
- Developed variations of the VGG16 network utilizing TensorFlow and the Mapillary Traffic Dataset.

TECHNICAL QUALIFICATIONS

Languages: Python, C++, C, Java, JavaScript, Prolog, GraphQL, Rust, SQL, NoSQL

Frameworks / Libraries: PyTorch, Tensorflow OpenCV, PyBind, Spark, Hadoop, Node, React, Electron, Apollo, Webpack, Jest, JUnit, Maven, Gradle, MongoDB, MySQL

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

License: NCEES Fundamental Engineer