Charles Ison

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Education

PhD **Oregon State University**, Computer Science — 2022 - Ongoing, Corvallis, OR

- **GPA:** 4.00/4.00
- **Research Interests:** Explainable AI (XAI), Mathematics Visualizations, Topology, Applied Machine Learning
- **Coursework:** Deep Learning, Machine Learning, Geometric Processing, Algebraic Topology, Differential Geometry, Topological Data Analysis, Scientific Visualizations, Algorithms, and Theory of Computation

BS **Clemson University**, Computer Science — 2015 - 2019, Clemson, SC

- Graduated Magna Cum Laude and a member of the Honors College
- Minor in Mathematical Sciences
- Scholarships: Palmetto Fellows, Presidential Scholarship, Clemson Scholar

Experience

Graduate Research Assistant, Oregon State University — June 2023 - Present, Corvallis, OR

- Worked on computer vision system for wildlife detection and counting on camera trap images for Oregon Department of Transportation
- Model performance surpassed currently published state-of-the-art for camera trap wildlife counting

Graduate Teaching Assistant, Oregon State University — Sept 2022 - June 2023, Corvallis, OR

- Guided undergraduate students during the development of their senior capstone projects using previous industry experience

Software Development Engineer II, Amazon — Oct 2021 - Sept 2022, Seattle, WA

- Project lead for 8 person team working on a multiyear initiative to rearchitect a business critical, monolithic backend service into microservices
- Collaborated across multiple teams for extensive research and design on long-term architectural vision
- Became a subject-matter expert for business domain and provided feedback for others working in the area through design reviews, code reviews, and weekly office hours
- Improved service caching and thread pool tuning
- Provided mentorship through weekly meetings with junior software development engineers

Software Development Engineer I, Amazon — July 2019 - Oct 2021, Seattle, WA

- Worked closely with business team to design components for legacy Java service that met business requirements while also reducing latency and removing technical debt
- Rewrote build system in Gradle to reduce build times by 50% and save four plus hours of cumulative engineer time per day
- Served as a dedicated mentor for two interns and onboarded several new hires onto the team

- Delivered time sensitive changes to unblock multiple major project launches
- Gave presentations on pipelines and test automation within team

Software Development Engineer Intern, Amazon — May 2018 - Aug 2018, Seattle, WA

- Developed internal Ruby on Rails and SQL system for Amazon Music playlist curators
- Tool enabled curators to automate the generation of playlists using historical customer listening data
- Communicated with a wide range of stakeholders to design a streamlined system that reduced a partnering team's weekly workload by 37 hours

Athletic Academic Services Tutor, Clemson University — Jan 2018 - May 2018, Clemson, SC

- Tutored student athletes in discrete mathematics, computer organization, and business calculus

Undergraduate Teaching Assistant, Clemson University — Aug 2017 - Dec 2017, Clemson, SC

- Assisted during labs for Software Development Foundations
- Graded exams and lab assignments

Software Engineering Intern, Avid Technology — June 2017 - July 2017, Berkeley, CA

- Worked on team responsible for Pro-Tools, industry standard for digital audio workspaces
- Developed C++ application using JUCE framework to validate third-party developer's AAX plugin's compatibility with Pro-Tools

Projects

A Multi-Planar Graph Visualization of Transformer Multi-Head Attention — 2023

- Worked on creating a novel, interactive visualization for Tranformer neural network multi-head attention
- Implemented as a wrapper for the Pytorch Transformer implementation

AlphaGo Zero Lite — 2023

- Developed a light-weight implementation of AlphaGo Zero that can be trained and run on a personal laptop to play board games through a command-line interface
- Implemented in PyTorch

Visualizing the Loss Landscape of Neural Nets — 2022

- Trained CNN models on the CIFAR-10 dataset and visualized the weights during backpropagation as a scalar field using dimensionality reduction
- Inspired by the 2018 NeurIPS paper from Hao Li et al.

Technical Skills

Languages: Java, Python, C++, C, R, Ruby, JavaScript, HTML, CSS

Machine Learning Libraries: PyTorch and TensorFlow

Databases: SQL and NoSQL

Cloud Computing: Familiar with AWS tools: Lambda, DynamoDB, S3, API Gateway, CloudFront, CloudFormation and CDK

Graphics: OpenGL and Blender

Application Development: Qt and JUCE

Continuous Integration and Continuous Deployment: pipelines, unit testing, integration testing, functional testing, stress testing and canary testing

Software Development: object-oriented programming, design patterns and multithreaded computing

Hobbies

Backcountry Skiing: AIARE - Level 1 Avalanche Training

Mountain biking: Treasurer for the OSU Cycling Club

Music production