Aaron Moseley

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PROFESSIONAL EXPERIENCE

Carlson Software

Machine Learning Engineer *August 2024 - Current*
Machine Learning Engineer Intern *May 2024 - August 2024*

- Led development and release of multiple new full-length ML pipelines, including custom data annotation tools, model architectures, and post-processing steps, aimed at detecting the boundaries of materials and roadways in aerial images
- Designed two novel model architectures with PyTorch leveraging semi-supervised and multi-task learning, both resulting in more than a **20% improvement** over previous strategies
- Developed extensive tooling for ground-truth data creation using C++, PyQt, and SQL to transform dozens of drone-captured orthomosaics into usable labeled data for computer vision models
- Developed modular plugin system for a point cloud visualization software using C++ and ZeroMQ
- Created custom HTTP server and API to automate training and inference pipelines for ML models

Infineon Technologies

Computer Engineering Intern *May 2023 - August 2023*

- Developed physical verification rules in SVRF and designed transistor-level validation cells for unit testing

University of Kentucky

Medical Imaging/Machine Learning Research Assistant *January 2023 - January 2024*

- Used PyTorch to develop a novel training approach for image segmentation models, shown to improve over baselines by up to **32.4%** across multiple metrics and datasets
- **Full paper** published at **ISBI 2024**, poster presented at **CCS 2023,** received Research Fellowship for Fall 2023

Lockheed Martin

Engineering and Technology Intern *May 2022 - August 2022*

- Created **$33,000** in annual savings and reduced report creation time by **90%** by building automation tools with VBA

FEATURED PROJECTS (full portfolio)

Hyperbolic Relevance Estimation for Improved Semantic Search

- NLP semantic search model developed in Pytorch leveraging SentenceBERT embeddings and hyperbolic geometry
- Shown to improve semantic representations of sentences by a factor of 2 over baseline Euclidean models

Deep State-Value Estimation for Long-Term Planning

- A novel reinforcement learning strategy combining deep image analysis models and tree-search algorithms
- Shows to improve over standard tree search by up to **10%** in a generic strategy game

Context-aware Multitasking for Medical Image Segmentation

- Novel multi-tasking framework that combines segmentation and classification for medical images
- Shows significant improvement over baseline and pre-trained models in Dice score and Haussdorf distance

FEATURED PAPERS/PRESENTATIONS

PolyCL: Context-Aware Contrastive Learning for Image Segmentation - Published at ISBI 2024, First Author
Context-aware Multitasking for Medical Image Segmentation - Presented at UK's 5 Minute Fast Track, First Author
Development of a Modular Current-Mode NaI(Tl) Detector Array for Parity Odd n-γ Measurements - Paper In Progress

EDUCATION

University of Kentucky - Bachelor of Science in Computer Science and Mathematics, Summa Cum Laude
Lexington, KY *August 2020-May 2024*

- **GPA: 3.97 / 4.0**
- Lewis Honors College, Competitive Programming Team (placed 1st in Kentucky at ICPC Regionals 2024), Undergraduate Science Journal Club
- Department of Computer Science Award for Outstanding Academic Achievement, Dean's List for all 8 semesters
- Undergraduate teaching assistant for classes covering Linux, intermediate C++, and UI development
- Research assistant in nuclear physics where I deployed a **data-collection and processing software** on the J-PARC particle accelerator, presented project at **APS 2023** and **NCUR 2023**

TECHNICAL SKILLS

Languages: Python, Java, C#, C++, C, SQL, LaTeX
Frameworks/Libraries/Tools: PyTorch, PyTorch Lightning, sklearn, HDF5Lib, NiBabel, Qt/PyQt, Vulkan, Git/Github, Unity