

Aaron Moseley

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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 Unix, intermediate C++, computer graphics, and UI development

Henry Clay High School

Lexington, KY

August 2016-May 2020

FEATURED PROJECTS ([full portfolio](#))

[Deep State-Value Estimation for Long-Term Planning](#)

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

[Hyperbolic Relevance Estimation for Improved Semantic Search](#)

- 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

[Hydraulic Erosion Simulation](#)

- Realistic simulation of gradual hydraulic erosion in real time on randomized or user-defined terrain
- Implements a Perlin noise procedural generation algorithm and allows for user customization

PROFESSIONAL EXPERIENCE

Carlson Software - Machine Learning Engineer Intern

Maysville, KY

May 2024 - August 2024

- Using PyTorch Lightning to discover architecture and training improvements for multiclass image segmentation models applied to satellite imagery, resulting in up to an **18%** improvement in Dice coefficient
- Developing a ground-truth generation application for line detection tasks using PyQt
- Creating a boundary detection machine learning model in PyTorch for material segmentation in aerial imagery

University of Kentucky - Medical Imaging/Machine Learning Research Assistant

Lexington, KY

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 Undergraduate Research Fellowship for Fall 2023

Infineon Technologies - Computer Engineering Intern

Lexington, KY

May 2023-August 2023

- Developed physical verification rules in SVRF and designed transistor-level validation cells for unit testing
- Utilized computer engineering expertise to resolve physical verification discrepancies in new hardware devices
- Created comprehensive Vim syntax highlighter for SVRF using Vimscript

University of Kentucky - Nuclear Physics Research Assistant

Lexington, KY

August 2022-January 2024

- Used C++ and HDF5Lib to create a high-speed data acquisition system for the NOPTREX experiment investigating gamma radiation emissions from decaying neutrons
- Presented at [NCUR 2023](#) and [APS April Meeting 2023](#), project used to collect data from a particle accelerator at the Japan Proton Accelerator Research Complex

Lockheed Martin - Software Engineering Intern

Lexington, KY

May 2022-August 2022

- Built data analysis and report automation tools using .NET framework and Microsoft Excel
- Led multiple projects creating **\$33,000** in annual savings and reducing time spent generating reports by over **90%**
- Held secret-level US security clearance (active until August 6, 2024)

TECHNICAL SKILLS

Languages: C++, C#, Python, Java, C, HTML, CSS, JavaScript, PHP, LaTeX, AMPL, Bash, MATLAB, SVRF

Frameworks/Libraries: .NET, PyTorch, PyTorch Lightning, sklearn, D2L, H5py/HDF5Lib, NiBabel, ROOT, Qt, Windows API

Tools: Google Colab, Git/GitHub/Gitea, Linux, Unity, Arduino, Anaconda, RapidAPI, Vim, Weights and Biases