JAY ROTHENBERGER

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EDUCATION

The University of Oklahoma, Norman, Oklahoma – *PhD in Computer Science*

August 2021 – expected May 2026 – GPA: 4.00

The University of Virginia, Charlottesville, Virginia– *B.S. in Computer Science and Mathematics*
August 2017 – May 2021 – Major GPA: 3.66

EXPERIENCE

NSF AI Institute for Research on Trustworthy AI in Weather, Climate, and Coastal Oceanography

Norman, Oklahoma – ***Graduate Research Assistant***
August 2021 – current
- Designed and developed a vision transformer model for image classification capable of producing its own class activation maps as an explanation for each prediction several hundred times faster than comparable post hoc methods
- Implemented parallel training strategies for the University of Oklahoma OSCER supercomputer to accelerate model training and enable model scaling for members of the institute decreasing model training time by 87.5%
- Mentored 4 undergraduate students in research experience leading to conference presentations at the annual meeting of the American Meteorological Society (AMS)

LumenUs Scientific

Norman, Oklahoma – ***Machine Learning Engineer Intern***
May 2024 – August 2024
- Developed, implemented, and executed efficient data pipelines for data integration, compression, and AI-ready processing for over 32 Terabytes of data
- Evaluated data storage and compression and storage formats for large datasets used during model training
- Developed and trained a foundation model for the The Earth Surface Mineral Dust Source Investigation Imaging Spectrometer (EMIT)

Vaisala

Boulder, Colorado – ***Machine Learning Intern***
May 2023 – August 2023
- Developed and trained a new (now operational) Deep Learning model for hail prediction that achieves state of the art nowcasting performance improving upon prior work by 32% CSI
- Design Implemented and applied standard explainable artificial intelligence (XAI) techniques including SHAP, PFI, and Integrated Gradients for higher dimensional observations in a HPC setting

PROJECTS

Few-Shot Road Surface Condition Classification
- Brought value to partners at New York State Department of Transportation (NYSDOT) by increasing the accuracy of few-shot image models for road surface condition classification.
- Leveraged hundreds of millions of unlabeled examples to improve performance of classification models.
- Improved generalization performance on unseen scenarios by 54% while decreasing training set size by 95%

Global Precipitation Forecasting Model
- Helped scientists at the National Center for Atmospheric Research to develop a global precipitation forecasting model
- Developed distributed training pipeline utilizing hundreds of GPUs and dozens of compute nodes
- Utilized distributed training techniques to leverage hundreds of terabytes of reanalysis data

PROFESSIONAL SKILLS
- *Programming Languages*: 6+ years of Python and other languages include C, C++, SQL, R, Java, and LaTeX
- *Machine Learning Software*: Tensorflow, Keras, PyTorch, Scikit-Learn, Git/GitHub, XGBoost, NumPy, Matplotlib,
- *Skills*: Computer Vision, Deep Learning/Neural Networks, Reinforcement Learning, Distributed Machine Learning, Generative Artificial Intelligence