Logan Frank

https://loganfrank.github.io

Email: frank.580@osu.edu
Phone: Available upon request

Education

Ohio State University — Columbus, OH
Ph.D. in Computer Science and Engineering — August 2019 - Present
Advisor: Prof. Jim Davis

Wright State University — Dayton, OH
B.S. in Computer Engineering — August 2015 - May 2019

Experience

Ohio State University, Computer Vision Laboratory — Columbus, OH
Graduate Research Associate — August 2019 - Present

Adversarial Machine Learning (current):

- Investigating properties of adversarial examples and leveraging these findings to develop and improve robustness and detection strategies (work is under U.S. Controlled Unclassified Information)

Improvements to Batch Normalization (ECCV 2022):

- Observed that the learned affine transformation parameters of batch normalization do not alter much from their initial state and can allow overly large values (output from the preceding normalization) to be passed forward
- Proposed an alternative initialization and updating strategy to the affine transformation scale parameter of batch normalization based on the aforementioned observations, which resulted in statistically significant accuracy gains over the default initialization and other related approaches for a variety of datasets and network architectures
- Theoretically showed that the proposed approach does not introduce any attenuated or amplified gradients within batch normalization that could affect the backward pass of other layers in the network

Agricultural Crop Stress Recognition (WACV 2021):

- Collaborated with the Department of Food, Agricultural, and Biological Engineering at Ohio State to apply a confidence-grounded hierarchical inference approach to plant stress identification

Ohio State University, Computer Science and Engineering Department — Columbus, OH
Graduate Teaching Associate — August 2019 - May 2020

- Received an instructor evaluation rating of 4.80 / 5.00 (0.54 above department average)

Air Force Research Laboratory — Dayton, OH
Graduate Research Intern — Summer 2019

- Researched into utilizing knowledge graphs in neural networks for more explainable, generalizable, and robust models
- Using the ADE20K dataset, developed a neural network architecture where an object recognition model outputs object probabilities and feeds them as inputs into a linear logistic regression model for more interpretable scene classification
- Aligned ADE20K with the WordNet ontology to circumvent the noisy, ambiguous, and rare object labels in the dataset

Publications

J. Davis, **L. Frank**
"Revisiting Batch Norm Initialization"
European Conference on Computer Vision (2022)

L. Frank, C. Wiegman, J. Davis, S. Shearer
"Confidence-Driven Hierarchical Classification of Cultivated Plant Stresses"
IEEE/CVF Winter Conference on Applications of Computer Vision (2021)

Z. Daniels, **L. Frank**, C. Menart, M. Raymer, P. Hitzler
"A Framework for Explainable Deep Neural Models Using External Knowledge Graphs"
SPIE Defense and Commercial Sensing: AI and ML for Multi-Domain Operations Applications Track (2020)

Technical Skills

Programming Languages: Python, Bash, Julia
Tools: Git, Singularity containers, PBS job scheduler, Slurm job scheduler, LaTeX

Professional Service, Awards, and Activities

Reviewer: CVPR2023, ECCV2022, CVPR 2022
SMART Scholarship Recipient, United States Department of Defense — 2019
NCAA Division 1 Athlete - Swimming, Wright State University Athletics — August 2015 - May 2017