Lucas Frey

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EXPERIENCE

Senior Machine Learning Engineer   **Sep 2022 – Present**
Applied Materials   *Santa Clara, California*

· Implemented a dynamical system-based probabilistic deep learning framework to solve process optimization problems
· Improved model performance by utilizing prior knowledge of domain experts
· Enabled model/optimization framework to transition seamlessly between local and cloud compute
· Developed interactive visualizations to enable interpretable model and optimization results

Machine Learning Engineer / Data Scientist   **Jun 2018 – Sep 2022**
Lam Research   *Fremont, California*

· Lead architect / codebase owner of Lam's repository of data science products used for optimization of complex semiconductor processes
· Optimized preexisting model framework resulting in 50X speedup in core optimization algorithm
· Developed fully automated data products (full back-end and front-end development) in support of real process optimization demos, requiring minimal end-user data science expertise
· Developed defect detection, segmentation and measurement algorithms used by process engineers to analyze thousands of 1500x1500 scanning electron microscope images per week
· Researched and implemented several Bayesian optimization algorithms for hyperparameter optimization, benchmarking each along a variety of figures of merit (final delivered algorithm reduced computation time from $\sim$8 hours to $\sim$15 minutes with no compromise in predictive accuracy)
· Constructed a virtual experimental environment with an interface to codebase, enabling statistically rigorous benchmarking of different algorithmic approaches
· Contributed bugfix and pull request to the **Tensorflow** GitHub repository

EDUCATION

Oregon State University   **Sep 2016 – Jun 2019**
Bachelor of Science   *Corvallis, Oregon*

Major Computer Science Applied in Machine Learning	Major GPA 3.67/4.0
Minor Mathematics	Overall GPA 3.58/4.0

PROJECTS

Driverless Formula Racecar   **Sep 2018 – Aug 2019**
Github.com/lcsfrey/OSU-Driverless-Formula-Student

· Developed deep learning computer vision system for a fully autonomous racecar
· Deployed models on the **NVIDIA AGX Xavier** embedded device using the **Robot Operating System (ROS)**
· Achieved 6th out of 20th place in the design competition at **Formula Student Germany 2019**

Traveling Salesman Problem (TSP) Algorithms   **Aug 2017 – Mar 2018**
Github.com/lcsfrey/TSP_Algorithms

· Implemented genetic and multithreaded graph algorithms to approximate the TSP
· Outperformed entire class of 30 in 7 out of 7 competition test cases in both speed and accuracy
· Implemented augmented reality graph overlay to display graph over drawings of graph nodes

TECHNICAL

Computer Languages: Python, C/C++, Java

Software & Tools: PyTorch, Jax, Tensorflow, Keras, Git, Tensorboard, Jupyter Lab/Notebook, Matplotlib, Pandas, Qt, Plotly, Dash, Ray Tune, NumPy, SciPy, scikit-learn, Pandas, OpenCV, pybind11, ROS, Docker, Azure, Slurm, SQL

Applied Math & Machine Learning: Linear algebra, Tensor and multivariable calculus, Numerical optimization, Ordinary/Partial differential equations, Neural networks (CNNs, Unets, Resnets, RNNs, LSTMs, etc.), Bayesian probability, Bayesian optimization, Calibrated uncertainty estimation, dimensionality reduction