Tyler King

contact

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education

Cornell University, Ithaca, NY
B.S. in Computer Science — Aug 2021 – present
GPA: 4.08/4.30

coursework
∗ = in progress

CS 4820: Algorithms	CS 4780: Machine Learning	CS 6756: Robot Learning
CS 6850: Information Networks	CS 2800: Discrete Math	ECE 6210: Linear Systems
CS 2110: OOP/Data Structures	ENGRD 2700: Probability/Stats	ECE 4960: Dynamic Networks

publications

Experimental Method for Studying Optimal Human Decisions (HCII 2022)
Nikolos Gurney, ***Tyler King***, and *John H. Miller*

Generalizing Minimum Path Star Topology Algorithms (arXiv 2021)
Tyler King and *Michael Soltys*

experience

NTT Research, Ithaca, NY
Research Intern — May 2023 – present
- Implemented a deep learning model via Neural ODEs based on coupled Kuramoto oscillators
- Developed a novel sparsification method for deep network regularization via locality pruning
- Deployed models on cloud in conjunction with WandB to perform hyperparameter optimization

ExxonMobil, Remote
Research Intern — March 2022 – present
- Leveraged non-classical computing for large-scale vehicle routing problems with thousands of depots
- Rewrote optimization code from Python in Pytorch to achieve an order of magnitude speedup
- Developed unit tests in Python to assert runtime and accuracy of simulated coherent Ising machine

USC Institute for Creative Technologies, Los Angeles, CA
REU Intern — May 2022 – August 2022
- Developed an experimental method to track human optimization in nonlinear environments
- Converted human decision metadata into image and graph formulations and preprocessed instances; leveraged deep neural networks to classify human vs. partial AI decisions in varied landscapes
- Current work on detecting AI assistance in abstract tasks is under review at AAAI 2024

Cislunar Explorers, Ithaca, NY
Software Engineering Intern — September 2021 – May 2022
- Implemented robust Python unit tests for satellite dynamics modeling to achieve >80% coverage
- Derived unscented Kalman filter equations for satellite attitude and trajectory estimation; added structured noise into unscented Kalman filter dynamics to account for image pixelation
- Modeled satellite dynamics given initial velocity/position and gravitational pull of heavenly bodies

projects

Coherent Ising Machine Optimizer — July 2022 – November 2022
- Helped develop cim-optimizer as a part of a ten million dollar NSF grant #1918549
- Built up the Bayesian optimization Hyperband and random hyperparameter optimization suite for three variations of the coherent Ising machine that vary initial conditions of simulated dynamics
- Confirmed accuracy of external field coherent Ising machine by implemented dynamics from original amplitude heterogeneity correction paper in PyTorch and analyzing runtime and performance
- Wrote example usages of cim-optimizer in Jupyter Notebooks and integrated full documentation with Sphinx. All documentation was hosted on readthedocs and integrated as a pip package via PyPI

AugNorm: Augmented Batch Normalization — March 2021 – May 2022
- Developed a new normalization scheme in deep neural networks via a generalized geometric median
- Outperformed current state-of-the-art GNN normalization schemes while improving number of FLOPs
- Introduced an adversarial attack where AugNorm is less affected by distribution shifts

languages & technologies

Python, Julia, Java, R, C, MATLAB
PyTorch, Tensorflow, Keras, WandB, AWS, Git/GitHub, Jupyter, Conda, Sklearn, Pandas, NumPy, Matplotlib, Seaborn, Networkx, Qiskit, Azure, Sphinx, Jira, Excel, Linux, LaTeX