Tyler King

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education

Cornell University, Ithaca, NY
B.S. in Computer Science — Aug 2021 – May 2025
GPA: 4.10/4.30

coursework
∗ = in progress

Natural Language Processing∗	Machine Learning	Linear Algebra
Computer Systems∗	Discrete Math	Differential Equations
OOP and Data Structures	Probability and Statistics∗	Multivariable Calculus

publications

An Experimental Method for Studying Complex Choices (HCII 2022)
Nikolos Gurney, ***Tyler King***, and *John H. Miller*

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

experience

USC Institute for Creative Technologies, Los Angeles, CA
REU Intern — May 2022 – August 2022

- Converted human decisions metadata into image and graph formulations and preprocessed instances
- Benchmarked deep learning architectures to achieve 59% testing accuracy on noisy human decisions
- Developed a novel median batch normalization technique to stabilize noisy input data

McMahon Lab, Ithaca, NY
Research Intern — January 2022 – present

- Created Python pipeline for analog optimization based on the simulated coherent Ising machine
- Deployed coherent Ising machine hyperparameter tuning on wandb with Bayesian optimization Hyperband; achieved best performance of 99.9958% on 1 year vehicle routing problems
- Modeled vehicle routing instances to make inferences on large-scale realistic systems

Cislunar Explorers, Ithaca, NY
Software Engineering Intern — September 2021 – May 2022

- Developed computer vision pipeline to detect heavenly bodies (sun, moon, Earth) from a 6U satellite
- Implemented robust Python unit tests for satellite dynamics modeling to achieve >80% coverage
- Derived unscented Kalman filter equations for satellite attitude and trajectory estimation using LaTeX; added structured noise into unscented Kalman filter to account for image pixelation

Notre Dame Nanophotonics, Notre Dame, Indiana
Research Intern — May 2021 – September 2021

- Benchmarked quantum circuits and processors using IBM's Quantum hardware
- Conducted error analysis on various implementations of Grover's (quantum search) algorithm via hardware (*ibmq_lima*) and noisy simulations (*qasm_sim*)
- Leveraged MATLAB and Matplotlib to model results and cross-validate statistical significance

projects

Hazardeous Asteroid Detection — April 2022 – May 2022

- Used Google Colab to benchmark various machine learning models for hazardeous classification of 4600+ asteroids; achieved a best performance of 99.68% with decision tree classification
- Utilized correlation matrices and various normalization techniques to preprocess data

iQuHACK Hackathon — January 2022

- Created mini-game that involved rotating 2-qubit statevectors into correct positions
- Deployed code on Microsoft Azure with IonQ's quantum computer using Qiskit as an SDK
- Leveraged deep Q reinforcement learning to train a bot and implement versus mode

Optimized A* Pathfinding — March 2021 – May 2021

- Theorized a novel approach to A* pathfinding by using greedy predrawn paths
- Achieved 6-fold speedup with comparable performance to classical A* pathfinding heuristics
- Developed pygame GUI to allow user interaction and visualize pathing

languages & technologies

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