

# Tyler King

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<b>education</b>	<b>Cornell University</b> , Ithaca, NY B.S. in Computer Science, summa cum laude Completed ECE PhD course requirements GPA: 4.07 / 4.30	Aug 2021 – May 2025
<b>research experience</b>	<b>McMahon Lab</b> , Ithaca, NY PI: Peter McMahon, Tatsuhiro Onodera (Cornell, NTT Research) <ul style="list-style-type: none"><li>Simulated oscillator networks for 100,000+ node optimization problems with &gt;99.995% accuracy</li><li>Optimized code from native Python to PyTorch for a 15x speedup and end-to-end GPU support</li><li>Trained coupled oscillator networks for image classification; achieved 99.4%+ accuracy on MNIST and state-of-the-art performance on CIFAR-10 (&gt;80%) for physically plausible neural networks</li><li>Developed a novel model pruning method for neural network regularization based on oscillator <math>L_2</math> locality; reduced expected physical wiring costs 100-fold</li><li>Contributed to grants from ExxonMobil (1-year grant) and NTT Research (summer PHI intern)</li></ul> <b>Computational Imaging Lab</b> , Ithaca, NY PI: Kristina Monakhova (Cornell) <ul style="list-style-type: none"><li>Constructed synthetic Gaussian- and Poisson-noisy datasets from real images for benchmarking</li><li>Leveraged asymmetric pinball loss to achieve state-of-the-art per-pixel uncertainty quantification</li><li>Introduced reconstruction losses and evaluation pipelines to assess image reconstruction performance</li></ul> <b>Helbling Lab</b> , Ithaca, NY PI: Elizabeth F. Helbling (Cornell) <ul style="list-style-type: none"><li>Introduced video segmentation algorithms to accurately track components of micro-scale robots</li><li>Utilized Grounded SAM for initial segmentation and SAM 2 to track robot center of mass; converted positional information into kinematic data and visualized robot trajectories and accelerations</li></ul> <b>Social Simulation Lab</b> , Playa Vista, CA PI: Volkan Ustun, Nikolos Gurney (USC), NSF-funded REU <ul style="list-style-type: none"><li>Ran MTurk experiments to evaluate the impact of complex decision making in humans</li><li>Converted human decision metadata into image and graph formulations and introduced explore/exploit priors and multi-channel inputs to improve AI aid classification</li><li>Benchmarked ML architectures to demonstrate better-than-chance prediction of AI aid usage</li></ul>	January 2022 – Present September 2024 – August 2025 October 2024 – March 2025 May 2022 – December 2023
<b>professional experience</b>	<b>Amazon Web Services</b> , Santa Clara, CA <i>Software Development Engineer (ML)</i> <ul style="list-style-type: none"><li>Prototyped multimodal VLM- and segmentation-based algorithms for an annotation model backend</li><li>Added multi-threaded support and retry logic for model invocations to accelerate runtime 10x on terabyte-scale image datasets</li></ul> <b>Turion Space</b> , Irvine, CA <i>Machine Learning Engineer Intern</i> <ul style="list-style-type: none"><li>Spearheaded space debris detection via on-satellite imaging using bit quantization and model compression, reducing memory overhead by 50x; included as a part of a \$400,000 Air Force grant</li><li>Generated, processed, and cleaned 800 GB of synthetic satellite data, reducing model error by 88%</li></ul> <b>Cornell Teaching and Grading Assistant</b> <ul style="list-style-type: none"><li>Developed/graded assignments and staffed office hours for Machine Learning (Fall 2023, Spring 2024, Fall 2024), Deep Learning (Spring 2025), Dynamical Networks (Spring 2024, Spring 2025), and Graduate Linear Systems (Fall 2024)</li><li>Maintained an average 5.0/5.0 rating across all 7 teaching assistant opportunities</li></ul> <b>MathCounts Tutor</b> <ul style="list-style-type: none"><li>August 2017 - April 2021: ran a middle-school-based tutoring program preparing students for regional and state-level MathCounts competitions; restarted program post-COVID and converted it to an online format; typeset problems and organized competitions</li><li>April 2021 – May 2025: external advisor; supported tutors virtually and created practice problems</li></ul>	Summer 2024, September 2025 - Present January 2024 – May 2024 August 2023 – May 2025 August 2017 – May 2025
<b>teaching experience</b>		

projects	<b>AugNorm: Augmented Batch Normalization</b> <ul style="list-style-type: none"> <li>Developed a normalization scheme in deep neural networks based on a generalized geometric median</li> <li>Designed out-of-distribution tests where AugNorm outperforms BatchNorm in plug-and-play settings</li> <li>Constructed a differentiable variant of AugNorm that removes manual hyperparameter tuning</li> </ul> <b>Coherent Ising Machine Optimizer</b>	September 2023 – May 2024 July 2022 – May 2023
	<ul style="list-style-type: none"> <li>Helped develop <a href="#">cim-optimizer</a> as part of a ten million dollar NSF grant #1918549; achieved up to 1,000 downloads/month during peak usage</li> <li>Added GPU support via PyTorch and accelerated numerical simulations 10-fold</li> <li>Integrated Bayesian optimization (Hyperband) and random search into a hyperparameter optimization suite for three coherent Ising machine variants, improving model error rates 3x</li> <li>Confirmed accuracy of external field coherent Ising machine by implementing dynamics from original amplitude heterogeneity correction paper in PyTorch and analyzing runtime and performance</li> </ul>	
conferences	<b>QUTCC: Quantile Uncertainty Training and Conformal Calibration for Imaging Inverse Problems</b>  <i>Cassandra Tong Ye, Shamus Li, Tyler King, Kristina Monakhova</i>	(under review ICLR 2026)
	<b>Detecting AI Assistance in Abstract Complex Tasks</b>  <i>Tyler King, Nikolos Gurney, John H. Miller, Volkan Ustun</i>	(HCII 2025)
	<b>Design of a Swimming Microrobot Powered by a Single Piezoelectric Bender</b> <i>Cameron Urban, Tyler King, Rafael Gottlieb, Hang Gao, Elizabeth F. Helbling</i>	(IROS 2025)
	<b>Experimental Method for Studying Optimal Human Decisions</b>  <i>Nikolos Gurney, Tyler King, and John H. Miller</i>	(HCII 2022)
workshops	<b>AugNorm: Differentiating the Generalized Geometric Median</b> <i>Tyler King, Ser-Nam Lim</i>	(NeurIPS OPT 2025)
	<b>Conformal, Nonlinear Scaling Model for Uncertainty Prediction</b>  <i>Cassandra Ye, Tyler King, Kristina Monakhova</i>	(CVPR UnCV 2025)
talks	<b>Physically Plausible Dynamical Systems for Machine Learning</b> <i>Tyler King</i>	(CUAI 2024)
	<b>Statistical Inference for Experimental Studies of Complex Choices</b> (USC ICT Symposium 2022) <i>Tyler King</i>	
grants	<b>CISE Travel Grant (\$1,200)</b> <i>National Science Foundation</i>	July 2025
	<b>ICT Research Experience for Undergraduates (\$7,650)</b> <i>National Science Foundation</i>	May 2022
languages & technologies	Python, Julia, Java, R, C, C++, TypeScript/JavaScript, SQL PyTorch, TensorFlow, Keras, Weights & Biases (wandb), AWS, Git/GitHub, Jupyter, Conda, NumPy, Azure, Sphinx, Jira, Excel, Linux, Docker, CUDA, L <sup>A</sup> T <sub>E</sub> X	