

Education

- 2019–Present **B.S., Computer Science**, *University of South Carolina*, Columbia, *GPA–3.908/4.0*
- Double Minor in Mathematics and Statistics.
 - President’s List for 3 semesters.
 - Dean’s List for 7 semesters.

Research Experience

- 2022–Present **Research Assistant**, *AISys Lab, University of South Carolina*, Columbia, SC
- Proposed a framework that trains deep generative models to provide post-hoc counterfactual explanations for the behavior of deep reinforcement learning agents.
 - Reviewed literatures in explainable artificial intelligence, causal representation learning, deep generative modeling, variational inference, and deep learning optimization techniques.
- 2019–2022 **Student Researcher**, *ARTS Lab, University of South Carolina*, Columbia, SC
- Developed in an audio-based machine learning wildfire detection system that runs on edge in remote forests. The results were published in MDPI electronics.
 - Assisted with the implementation and visualization of adaptive particle swarm optimization for ship structure modal analysis that led to a publication in Conference Proceedings of SPIE.
 - Proposed using Gaussian Process to perform state estimation of mechanical structures.
 - Developed a C++ Arduino library for an accelerometer used in vibration detection sensor package.

Research Interest

- Causal Inference
- Reinforcement Learning
- Explainable AI
- Generative Modeling
- Numerical Optimization
- Lifelong Learning
- Neuromorphic Computing
- Computer Vision Scene Understanding
- Transfer Learning
- Stochastic Processes

Journal Articles

- [2] Yanzhou Fu, Austin R.J. Downey, Lang Yuan, Hung-Tien Huang, Avery Pratt, and Yunusa Balogun. Real-time product structural quality validation for fused filament fabrication. *Additive Manufacturing*, 2022 (Under Review)
- [1] Hung-Tien Huang, Austin R.J. Downey, and Jason D Bakos. Audio-based wildfire detection on embedded systems. *Electronics*, 11(9):1417, 2022

Conference Proceedings

- [1] Jason Smith, Hung-Tien Huang, Austin R.J. Downey, Alysson Mondoro, Benjamin Grisso, and Sourav Banerjee. Multi-event model updating for ship structures with resource-constrained computing. In *Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems 2022*, volume 12046, pages 108–114. SPIE, 2022

Project

[generative_models](#)

- 2022–Present I currently provide Python implementation for Wasserstein Autoencoder (WAE) using PyTorch. The package is also used in my senior capstone software engineering project, in which our team is creating a website that allows user to interact with autoencoders’ latent space.

Motion Planning in Dense Traffic with Reinforcement Learning

2021–Present We implemented deep reinforcement learning agent to maneuver on highway without collision while maximize the distance traveled within given time without speeding.

[pyswarm_plugins](#)

2021–Present I currently provide Python implementation for Adaptive Particle Swarm Optimization (APSO).

[sklearn_plugins](#)

2021–Present I currently provide Python implementations for spherical k-means clustering and relevance vector machine (RVM) following `scikit-learn` API.

Arduino Library for SCA3300 Accelerometer

2019–2020 An Arduino C++ library that communicates with SCA3300 accelerometer through SPI protocol.

Teaching Experience

2020–2022 **Teaching Assistant**, *University of South Carolina*, Columbia, SC

Undergraduate teaching assistant for CSCE 145/146 Algorithmic Design I/II. The duty includes supervise lab session, give high-level descriptions to data structures and simple software design pattern, and assist students to debug Java applications.

2021 **Teaching Assistant**, *University of South Carolina*, Columbia, SC

Teaching assistant for MATH 524 Nonlinear Optimization, an advanced undergraduate course. The duty includes grading the exams. The course covers descent methods, conjugate direction methods, and Quasi-Newton algorithms for unconstrained optimization; globally convergent hybrid algorithm; primal, penalty, and barrier methods for constrained optimization.

2019 **Instructor**, *Taiwan Fund for Children and Families*, Taipei, Taiwan

- Prepared and gave lectures to elementary school students about road safety.
- Tutored a special need child make paper crafts of buses.

Skill

Language	Python, C++, Java, C#, \LaTeX
Library	PyTorch, TensorFlow, scikit-learn, statsmodels, NumPy, Ray
Theory	Probability, Statistics, Stochastic Processes, Variational Inference, Numerical Optimization
Application	Deep Learning, Reinforcement Learning, Generative Modelling, Bayesian Network