Nicholas Ho

Phone (+1 971 998 8162) | Email: nichola2@asu.edu

Education

Arizona State University (ASU)

Barrett, The Honors College — Tempe, Arizona
BSE: Computer Science and Mathematics — Grad Date: May 2023
GPA: **4.00/4.00** — **Github Profile: https://github.com/NickDST**

Research Experience

Research Assistant at Structural Systems Biology Lab, Biodesign Institute, ASU, Arizona, US — May 2020 – Now

- Developed deep learning models to evolve noisy dynamical molecular systems using Neural SDEs, Graph Neural Networks, Hamiltonian Neural Networks, and more.
- Utilizing Reinforcement Learning to explore protein conformational space.
- Helped develop a Conditional Generative Adversarial Network to generate minimum action pathways for dynamics.
- Did extensive testing on the model capacity of LSTMs to be used to evolve a dynamical system.

Summer Researcher Carnegie Mellon Statistics and Data Science Summer Program, Pennsylvania, US — June 2021 – August 2021

- Developed a new framework for studying game soccer ball dynamics by approximating underlying potential energy functions to the ball's stochastic movement.

Research Assistant, Biodesign Institute, ASU, Arizona, US

Undergraduate research assistant Huansheng Lab — Sept 2019 – May 2021

- Conducted data engineering and analysis on genomes assembled from a metagenome in order to study the strain level variance within microbiome communities.
- Implemented a web system that highlighted which genes present in a pathway for particular cyanobacteria species using PFAM's Hidden Markov Model package, JavaScript, SQL databases, shell and Python.

Undergraduate research assistant Ferran Garcia Pichel Lab — Sept 2019 – May 2021

- Developed a Python Plugin for Qiime2 for the relationship between ribosomal gene copy number and size.

Publications

- John Cava, John Kevin, John Vant, **Nicholas Ho**, Ankita Shulka, Pavan Turaga, Ross Maciejewski, and Abhishek Singharoy. "**Towards Conditional Generation of Minimal Action Potential Pathways for Molecular Dynamics.**" ArXiv:2111.14053 [Physics, q-Bio], November 28, 2021. http://arxiv.org/abs/2111.14053.
- Wei Du, Gaoyang Li, **Nicholas Ho,** Landon Jenkins, Drew Hockaday, Jiankang Tan, Huansheng Cao, CyanoPATH: a knowledgebase of genome-scale functional repertoire for toxic cyanobacterial blooms, _Briefings in Bioinformatics_, 2020;, bbaa375, https://doi.org/10.1093/bib/bbaa375

Conference and Workshop Presentations

Presented at the ELLIS Machine Learning for Molecule Discovery Workshop, Cambridge, England — Dec 2021

- Presented on conditional generative adversarial networks for minimal action potential pathways.

Presented at the Carnegie Mellon Sports Analytics Conference, Pennsylvania, US — Nov 2021

- Developed and presented a framework for using stochastic processes to study soccer ball dynamics.

Presented at the NAMD Developer Workshop at Urbana Champaign, Champaign, Illinois — Sept 2021

- Presented on results from using neural networks to evolve physical molecular systems.

Presented at the Ohio State University Sports Analytics Association Conference, Ohio, US — Nov 2021

- Developed and presented a framework for using stochastic processes to study soccer ball dynamics.

International Conference on Big Data and Education Presentation Excellence Award, Honolulu, Hawaii — March 2018

- Presented on the inverse correlation between carbon dioxide and PM2.5 and impacts on student learning.

Work Experience

Summer Intern at Western Tool & Supply, Portland, Oregon — June 2020 – July 2020

- Implemented and trained an LSTM Recurrent Neural Network to predict customer purchase likelihoods.
- Integrating and using Bluetooth LE between microcontrollers and Google Chrome into their IOT system.

Concordia International IOT Environmental Sensors and Data Analysis, Shanghai, China — Jan 2018 – May 2019

- Built, programmed, and deployed 30 microcontroller sensors capable of streaming air quality data.
- Developed and implemented the system architecture and backend SQL on locally hosted Linux servers.

Scholarships

President's Award - New American University, ASU, Arizona, US — August 2019 – May 2023

Skills

Proficient in Python, C/C++, Bash, R, JavaScript, PHP, SQL, Perl, Google Cloud Platform, Cloud Computing, Machine Learning.
Can learn any new programming languages or tools if needed. ☺

Leadership/Community Experience

Member of the Arizona State University Fulton Student Council — August 2019 – 2020

- Booked and helped organize events within the Fulton Student Council for the engineering students of ASU