

MICHAEL ITO

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EDUCATION

University of Hawaii, Manoa

2018 - 2022

BS Computer Science and Mathematics Double Major

Overall GPA: 3.90

RESEARCH EXPERIENCE

Sadowski Lab - Deep Learning and Artificial Intelligence (UH Manoa)

2020 - 2022

Tools Required: Linux cluster environments, high-performance computing, parallel hyperparameter optimization, data engineering in Python, Tensorflow, Pytorch, DeepGraphLab, Github

IfA REU: Group Equivariant Neural Networks for Spectropolarimetric Inversion in Four Dimensions. Involves enforcing model equivariance on groups to capture symmetries in a high dimensional solar physics dataset.

NASA Research Intern (x2): Deep learning for Spectropolarimetric Inversion in Four Dimensions. Involves developing a deep learning pipeline and using parallel hyperparameter optimization on a massive GPU cluster for the stokes inversion in a high dimensional solar physics dataset.

Undergraduate Research Fellow: Evolution-Informed Neural Networks for Microbiome Data Analysis. Involves designing sparsely connected neural networks, recursive neural networks, graph neural networks, and tree LSTMs for high dimensional microbiome datasets.

Biostatistics Group - Biostatistics (John A. Burns School of Medicine)

2020 - 2021

Tools Required: Data handling, machine learning and statistics in R

Undergraduate Research Assistant: Machine Learning Ensemble-based DNA Methylation Signature for Colorectal Cancer Screening. Involves algorithm development using machine learning ensembles for cancer prediction.

Yoshizawa Lab - Behavioral Neuroscience and Genetics (UH Manoa)

2018 - 2020

Tools Required: Biological laboratory training, basic statistics in R

UROP Recipient: Association between Autism-like behaviors and Gut Microbiota. Involves behavioral assay administration, sample maintenance and dissection, video data analysis, and genetic sequencing analysis.

Tully Lab - Cosmology (Institute for Astronomy)

2018

Undergraduate Volunteer: Classification of local spiral galaxies based on size, spatial inclination, and morphology.

Graduate Projects

2020-2022

ICS632 High Performance Computing: Neural Architecture Search on HPC Clusters

ICS621 Analysis of Algorithms: Hierarchical Clustering for High Dimensional Microbiome Sequences.

CEE696 Deep Learning: Deep Learning for Solar Physics

ZOOL442 Neuroscience: A Survey on Biologically Plausible Deep Learning Algorithms

WORK EXPERIENCE

Karamperidou Lab - Climate Dynamics (UH Manoa) 2020 - 2022

Tools Required: Linux cluster environments, high-performance computing, Python, Tensorflow

Undergraduate Research Scientist: Atmospheric blocking detection and explainable artificial intelligence (XAI) for the El Nino Southern Oscillation and tropical cyclones. Involves designing efficient algorithms, building deep learning pipelines, and utilizing XAI methods for climate dynamics. Position also includes presenting new deep learning methods in lab meetings, consulting graduate students about software development, and demonstrating the use of modern computing tools (HPC, Github, Jupyter)

UH Manoa Teaching Assistant 2019, 2021

MATH242 Calculus II, ICS311 Algorithms

ACADEMIC ACHIEVEMENTS

Publications

M. Ito, Y. Glaser, and P. Sadowski. Evolution-Informed Neural Networks for Microbiome Data Analysis. *The 2nd International Workshop on Deep Learning Techniques for Bioinformatics and Biomedicine (accepted)*, 2021

M. Ito, I. Cunnyngham, X. Sun, and P. Sadowski. Group Equivariant Neural Networks for Spectropolarimetric Inversions in Solar Astronomy. *Asian Conference in Machine Learning (submitted)*, 2021

C. Karamperidou, **M. Ito**, S. Camargo, C. Patricola, C. Lee, and P. Sadowski. Deep learning for Assessing the Relationship between ENSO diversity and Tropical Cyclone Activity (*preparation*), 2021

Ito, M., Hudson, A., Lactaoen, K., Mone, D. and Yoshizawa, M. Gut morphology and gut microbiota composition are associated with sleep regulation of the sleep-less Mexican cavefish (*preparation*), 2021

M. Ito, C. Siriwardhana, Y. Fu, and Y. Deng. Machine Learning Ensemble-based DNA Methylation Signature for Colorectal Cancer Screening (*preparation*), 2021

Conference Presentations

The American Geophysical Union, New Orleans, LA. “Explainable Artificial Intelligence for Insights into the Relationship between ENSO and Tropical Cyclone Genesis”, December 2021 (**accepted for talk**)

The American Geophysical Union, New Orleans, LA. “Spectropolarimetric Inversions with Group Equivariant Neural Networks”, December 2021

2nd Workshop on Knowledge Guided Machine Learning, Minneapolis, MN. “Explainable Artificial Intelligence for Insights into the Relationship between ENSO and Tropical Cyclone Genesis”, July 2021

University of Hawaii Institute for Astronomy REU, Honolulu, HI. “Spectropolarimetric Inversions with Group Equivariant Neural Networks”, July 2021

NASA Hawaii Space Grant Consortium University Research Internship Symposium, Honolulu, HI. “A Deep Learning Approach to the Stokes Inversion Problem”, November 2020

The Allied Genetics Conference, Washington, DC. “Autism-like behaviors are likely to be regulated by distinct genetic factors in the Mexican cavefish”, April 2020

Society for Advancement of Chicanos/Hispanics and Native Americans in Science, Honolulu, HI. “Association between Autism-like behaviors and Gut Microbiota”, November 2019

Funding, Scholarships, and Awards

University of Hawaii Institute For Astronomy REU — \$7,500	2021
NASA Space Grant University Research Internship Extension — \$4,500	2021
Colleges of Arts & Sciences Alumni Association Annual Scholarship — \$2,000	2021
NASA Space Grant University Research Internship — \$4,500	2020
Sadowski Lab Summer Undergraduate Research Fellowship — \$6,200	2020
The Allied Genetics Conference Presentation Travel Stipend: \$1,500	2020
Summer Session Freshman Merit Scholarship Award — \$1,200	2019
SACNAS National Diversity in STEM Presentation Travel Stipend — \$500	2019
Undergraduate Research Opportunities Program Funding — \$5,000	2019
UH Manoa Chancellor Scholarship — \$10,000 per year	2018 - 2022
Hawaii Rotary Youth Foundation Scholarship — \$5,000	2018