Lillian Huang

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Education

2018-Present **University of Maryland, College Park**
Pursuing Ph.D. in Computer Science
Advisor: Professor Abhinav Shrivastava

2014-2018 **University of Michigan, Ann Arbor**
B.S. in Physics, Honors
B.S. in Computer Science

Research Experience

January 2019-Present

Graduate Research Assistant
University of Maryland
Advisor: Professor Abhinav Shrivastava

Working on the low-shot learning problem with respect to object classification in images from ImageNet by generating new samples for the low-shot categories by mining visual transformations in feature space within base categories and applying them to low-shot samples

- Try to introduce semantic discrimination when mining transformations to try to ensure visual similarity between categories
- Also introduce semantic discrimination when applying the transformations to low-shot categories for generation
- Assert similarity using WordNet hierarchies, word2vec vectors, and eventually graph convolutional networks

August 2017-July 2018

Undergraduate Research Assistant
University of Michigan
Advisor: Professor Fred Adams

Investigating the multiverse problem; specifically, whether another universe would still be able to support life by producing vital elements with a different 0+ energy level for carbon

- Paper accepted in *Astroparticle Physics* (See Publications section, entry #1)
- Explored a large swath of parameter space for elemental yield and ran simulations on the stellar evolution package MESA; determined that not only is the current universe by no means "fine-tuned" for carbon production
- Subject of Senior Honors Thesis

June 2017-August 2017

Summer Student
NSF REU Program at CERN
Advisor: Daniel van der Ster

Worked in the storage group in CERN's IT department to create a Dockerized release management system for the CernVM-File System, a read-only filesystem that provides a software distribution service amongst experiments at CERN

- Implemented prototype of a new release management system that uses Docker containers instead of VMs
- Created a remotely-hosted back-end using S3 protocol, configured for use for the new release management system

May 2016-August 2016

Student Engineer
Open Storage Research Infrastructure (OSiRIS)
Advisor: Professor Shawn McKee

Worked on NSF-funded project at University of Michigan, which aims to create a storage infrastructure to facilitate data sharing and storage between separate institutions; mainly focused on collecting, storing, and visualizing the project's performance statistics

- Learned about building and managing storage infrastructure, especially in terms of how to monitor our system's functions in order to debug potential future problems
- Briefly worked on network optimization

May 2015-August 2015

Undergraduate Research Assistant
University of Michigan
Advisor: Professor Junjie Zhu

Worked with deep and shallow neural networks for regression to recapture lost neutrino data to predict polarization angles in same-sign WW boson scattering

- Paper accepted in *Physics Rev. D* (See Publications section, entry #2)
- Implemented supervised machine learning algorithms in Python in order to construct various neural network architectures to find the most efficient method

Teaching Experience

August 2018-December 2018

Discrete Structures
University of Maryland
CMSC250

TA'ed for an introductory discrete math and proofs course for undergraduates in computer science; taught hour-long discussion twice a week

Honors and Achievements

2018-2020 **Dean's Fellowship**
University of Maryland, College Park

2014-2018 **Gloria Wille Bell & Carlos R. Bell Scholarship**
University of Michigan, Ann Arbor

Relevant Coursework

Graduate	Deep Learning, Advanced Techniques in Visual Learning and Recognition, Advanced Numerical Optimization, Algorithms in Machine Learning: Guarantees and Analyses
Undergraduate	Introduction to Artificial Intelligence, Introduction to Machine Learning

Publications

1. L. Huang, F. C. Adams, and E. Grohs, "Sensitivity of Carbon and Oxygen Yields to the Triple-Alpha Resonance in Massive Stars," *Astroparticle Physics*, 105 (2019), p. 13, arXiv: 1809.09168 [astro-ph.SR]

2. J. Searcy, L. Huang, M. A. Pleier, and J, Zhu, "Determination of the *WW* polarization fractions in $pp \to W^{\pm}W^{\pm}jj$ using a deep machine learning technique," *Phys. Rev.* **D93** (2016) no. 9, 094033, arXiv:1510.01691 [hep-ph]