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

Thesis Title: Recognition with Minimal Supervision by Learning and Leveraging Knowledge

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

Publications

1. L. Huang, S.-N. Lim, A. Shrivastava. "Knowledge-Driven Hallucination for Low-Shot Classification." *Women in Machine Learning Workshop at NeurIPS* (2019).

2. 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]`

3. 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]`

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

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

Relevant Coursework

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