

# Lillian Huang

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## RESEARCH INTEREST

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I want to develop graphics applications that save artists time and effort without forfeiting creative control. Computer vision methods are key components in implementing these tools, as visual understanding is necessary to achieve this goal. Combining this approach with my artistic background helps me design effective, user-focused tools.

## EDUCATION

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**University of Maryland, College Park** August 2018 – Present  
M.S. in Computer Science (formerly Ph.D. student) GPA: 3.968

**University of Michigan, Ann Arbor** September 2014 – April 2018  
B.S. in Physics, Honors GPA: 3.903  
B.S. in Computer Science

## RESEARCH EXPERIENCE

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**Graduate Research Assistant** *University of Maryland* January 2019 – Present

- My current research focuses on video interpolation for hand-drawn animation, or computer vision-aided “in-betweening.” One of our main challenges with this project is that the sparse visual nature of our domain gives less information to find correspondences for object tracking. We implement a number of deep learning modules and novel loss terms in our training criterion to accommodate these difficulties. Our other challenge is that there are no standard datasets for this domain, which we are in the process of overcoming by generating a synthetic “hand-drawn” animation interpolation dataset using Blender and Python.
  - Led project conceptualization, implementation, and experimentation, leveraging interdisciplinary expertise (ML and animation) to guide project
  - Build end-to-end machine learning pipelines and process large datasets in Python and PyTorch
  - Built and maintained the first custom animation interpolation dataset for our domain using Python and Blender, optimizing for storage and retrieval efficiency
  - Made qualitative visual improvements over state-of-the-art video interpolation methods
  - Effectively communicated motivations, strategies, and goals of project to reviewers, collaborators, and artists
- I previously worked on a Facebook (now Meta) grant-funded project to improve few-shot image classification by leveraging the power of generative models and language models to augment training data.
  - Increased classification accuracy against baselines (+1.5%) by “hallucinating” training samples from textually-relevant existing image classes
  - Presented a poster on this work at the Women in Machine Learning workshop at *NeurIPS* (Publications #1).

**CERN Student Researcher (Systems)** *NSF REU Program at CERN* June 2017 – August 2017

- Created a new, modularized release management system for the centralized file system at CERN.
  - REU Program accepts ~5% applicants nationwide
  - Implemented a prototype that replaced the virtual machines in the old system with Docker containers, improving space and time efficiency
  - Created data redundancy by putting data in AWS cloud instead of individual computing nodes

**Student Engineer** *Open Storage Research Infrastructure (OSiRIS) at University of Michigan* May 2016 – August 2016

- Did systems engineering for an NSF-funded storage infrastructure project called OSiRIS, which aims to create storage infrastructure that facilitates data sharing and storage between separate institutions.
  - Collected, stored, and visualized performance metrics for the system using Ceph, Grafana, and Kibana

**Undergraduate Research Assistant (Physics)** *University of Michigan* May 2015 – July 2018

- Imagined what might happen in a universe where we tweaked the process that turns helium into carbon, an element necessary for life. We ran simulations to see if these changes would allow for life to exist as it does now.
  - Ran simulations and analyzed the results, visualizing complex data in clear-cut plots to demonstrate key insights
  - Published findings as a first-author journal paper (Publications #2)
- Used machine learning to recover lost neutrino data in experimental particle interactions, as neutrino information is not picked up by most detectors.
  - Implemented and trained a neural network from scratch to recover neutrino data from detected particle data
  - Published method in a second-author journal paper (Publications #3)

## TEACHING EXPERIENCE

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- Teaching Assistant (Undergraduate Discrete Math)** *University of Maryland* August 2018 – December 2018
- Led an hour-long discussion section twice a week, held office hours, graded homeworks and exams
  - Prioritized student understanding of key concepts and proof techniques (rather than simple solution regurgitation), leading to improved class performance

## LEADERSHIP AND OUTREACH

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- Graduate Student Council** *University of Maryland CS Department* August 2021 – Present
- Organize a student-led grad-to-grad peer mentorship program
  - Pair mentors and mentees for year-long partnerships
  - Coordinate, prepare, and present workshops on topics relevant to graduate student life
- Club Synchronized Swimming Council** *University of Michigan* August 2017 – April 2018
- Organized fundraising efforts to raise hundreds of dollars for new swimsuits, pool fees, and travel costs
  - Coordinated volunteering and competitive events for the team

## SKILLS, LANGUAGES, TOOLS, WORK STATUS

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**Proficient:** Python, Bash, PyTorch **Familiar:** C++, C, C#, JavaScript, Git, Docker, Blender, Maya **U. S. Citizen**

## AWARDS

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- National Science Foundation Graduate Research Fellowship (NSF GRFP)** 2020 – Present  
National grant awarded to ~2000 graduate students annually; \$37k per year for 3 years
- Gloria Wille Bell and Carlos R. Bell Scholarship** 2014 – 2018  
Scholarship awarded to ~5 undergraduate STEM students per year at University of Michigan; \$10k per year for 4 years