

Allen Christopher Marquez

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RESEARCH INTERESTS

Machine Learning (GANs & NLP), Distributed Machine Learning, Differential Privacy, Algorithmic Fairness

EDUCATION

B. S. Computer Science, California State University, Los Angeles Fall 2019-Spring 2022
Current GPA: 3.83

East Los Angeles College (ELAC), Monterey Park, CA Fall 2016-Spring 2019
Transferred to California State University, Los Angeles (CSULA)

RESEARCH EXPERIENCE

Undergraduate Research Intern, Carnegie Mellon University(CMU) June 2021-October 2021
Advisor: *Dr. Zhiwei Steven Wu*

- Contributed to designing and implementing a modular bench-marking platform for differentially private algorithms.
- Integrated differentially private algorithms and integrated new datasets into platform using Python.
- Studied modern differential privacy theory by writing a literature review.
- Presented this work as an oral presentation for sponsors of the REU (National Security Agency & National Counterintelligence and Security Center).
- Presented this work as a poster presentation for the faculty at the Institute of Software Research and fellow research interns at CMU.

NSF CREST-CEaS Fellow, CSULA December 2019-Present
Advisor: *Dr. Radi Jishi*

- Modeled the optical properties of hyperbolic metamaterials using linux-based software WIEN2k.
- Wrote Python scripts to read the output files from WIEN2k and plot results.
- Wrote an abstract for this work that was accepted for the Emerging Researchers National Conference 2022.
- Preparing first-author manuscript on this project for submission to research journal.
- Managed budget to purchase two high-end workstations that require optimization for calculations.
- Documented and installed compilers and dependencies required for software required for calculations.

Undergraduate Research Intern, Carnegie Observatories June 2020-May 2021
Advisor: *Dr. Alexander Ji*

- Implemented a new method in Python to aid astronomers in automatically analyzing stellar properties from telescope data.

- Adapted an existing neural network that emulates a physical model of stellar spectra for optical spectra.
- Strengthened scientific communication skills through bi-weekly oral presentations to Observatories astronomers and fellow research interns.
- Presented this work as oral presentation at Carnegie Observatories, and as poster presentation at the 237th American Astronomical Society conference.

Undergraduate Research, Carnegie Observatories & ELAC June 2018-December 2018
Advisor: *Dr. Alexander Ji*

- Measured the elemental composition of five stars by using high-resolution stellar spectra.
- Loaded and cleaned telescope data with each star containing large amounts of data.
- Calculated stellar parameters, and performed the line measurements.
- Presented a scientific poster at the 2018 Mathematics, Engineering and Science Achievement (MESA) Symposium.
- Created collaboration between Dr. Ji from Carnegie Observatories and Director of MESA Dr. Djuradj Babic to extend research by providing funding for students of the MESA program.

TEACHING EXPERIENCE

Supplemental Instructor (S.I.) Leader, ELAC February 2019-June 2021

- Led recitation sections that teach problem solving skills and collaboration.
- Collaborated with program director and Physics department to hire new S.I. Leaders.
- Mentored other S.I. Leaders by providing feedback on their recitation sessions.
- Courses:
 - Physics 1: Mechanics of Solids Spring 2019
 - Physics 3: Electricity and Magnetism Summer 2019
 - Physics 101: Physics For Engineers And Scientists I Fall 2019
 - Physics 102: Physics For Engineers And Scientists II Spring 2020
 - Physics 101: Physics For Engineers And Scientists I Fall 2020
 - Physics 101: Physics For Engineers And Scientists I Spring 2021

ABSTRACTS

2. Marquez, A., Jishi, R. A. (2021). Optical Properties of Hyperbolic Metamaterials Using Density Functional Theory. (*Submitted and Accepted to Emerging Researchers National Conference 2022*)
1. Marquez, A., Ji, A., Ting, Y., & Hansen, T. (2021). Inferring Stellar Labels from Optical High-Resolution Spectra with The Payne. *Bulletin of the AAS*, 53.(1)

CONFERENCES & PRESENTATIONS

Emerging Researchers National Conference 2022, Washington, D.C. February 2022
Optical Properties of Hyperbolic Metamaterials Using Density Functional Theory

Institute for Software Research Symposium , Carnegie Mellon University <i>Benchmarking Platform for Differentially Private Algorithms</i>	August 2021
American Astronomical Society 237 , Virtual <i>Inferring Stellar Labels from Optical High-Resolution Spectra with The Payne</i>	January 2021
Carnegie Observatories Summer Student Research Symposium , Virtual <i>Inferring Stellar Labels from Optical High-Resolution Spectra with The Payne</i>	August 2020
MESA Symposium , ELAC <i>Stellar Photosphere Spectroscopy</i>	September 2019

SCHOLARSHIPS AND AWARDS

Edison STEM Scholarship , Amount: \$5,375	August 2020-Present
CREST-CEaS Fellowship Scholarship , Amount: \$14,000	January 2020-Present
Deans Honor List , CSULA	December 2019-Present
Best Oral Presentation 2nd place , CSULA	December 2019

MENTORSHIP

CASSI Alumni Mentor , Carnegie Observatories	June 2021-August 2021
MESA Peer Mentorship Program , ELAC	August 2020-June 2021
Supplemental Instructor Mentor , ELAC	Fall 2019-June 2020

PROFESSIONAL SOCIETIES & CLUBS

Association of Computing Machinery , CSULA Chapter	August 2019-June 2020
Mathematics Engineering Science Achievement , ELAC	August 2018-June 2019
Physics and Astronomy Club , ELAC	August 2018-December 2018