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Allison Liu

Curious and motivated student seeking to provide programming and analysis experience to scientific and industrial applications.

EDUCATION

B.S. Applied Math, Computer Science Minor
University of Colorado Boulder, Expected Graduation May 2022

- **GPA: 3.743/4.000**
- Relevant Coursework: Computer Science- Data Structures, **Algorithms**, **Artificial Intelligence, Machine Learning**, **Software Development, Database Systems**
  Math- Multivariable Calculus, Linear Algebra, **Probability, Numerical Analysis, Fourier Analysis**
- Awards and Honors: Engineering Honors Program, BOLD Scholar, College of Engineering Dean's List
- Clubs and Organizations: CU Women's Ultimate Frisbee, Society of Women Engineers (SWE)

WORK EXPERIENCE

Laboratory for Atmospheric and Space Physics (LASP) - University of Colorado Boulder
Student Research Assistant, February 2021 - Present

- Build, train, and optimize a neural network using a variety of solar observation sources, including x-ray and magnetic flux data, to predict the occurrence of M and X class solar flares within a prediction window of 0-3 days. Data pre-processing and exploration, feature engineering, and statistical analysis of results.

Kapteyn-Murnane Group, JILA - University of Colorado Boulder
Student Research Assistant, June 2017 - August 2020

- Designed and built a commercial-quality M^2 laser diagnostic device in MATLAB. I interfaced multiple pieces of scientific equipment and created a graphical user interface to collect and analyze data. The program characterized a laser beam by implementing a modified phase-retrieval algorithm.
- Interfaced a novel laser system with an existing chemical engineering experiment. Used SDK Driver.

PUBLICATIONS

- L. Rego, K. Dorney, N. Brooks, Q. Nguyen, C. T. Liao, J. San Román, D. Couch, **A. Liu**, E. Pisanty, M. Lewenstein, L. Plaja, H. C. Kapteyn, M. M. Murnane, & C. Hernández-García. *Generation of extreme-ultraviolet beams with time-varying orbital angular momentum.* Science 364, 6447 (2019). DOI: 10.1126/science.aaw9486
- D. Couch, Q. Nguyen, **A. Liu**, D. Hickstein, H. Kapteyn, M. Murnane, & N. Labbe. *Detection of the Keto-Enol Tautomerization in Acetaldehyde, Acetone, Cyclohexanone, and Methyl Vinyl Ketone with a Novel VUV Light Source.* Proc. Combust. Inst. 38 (in press 2020). DOI: 10.1010/j.proci.2020.06.139

VOLUNTEERING

Partnerships for Informal Education in the Community (PISEC), February 2020 – May 2020

- Volunteered weekly as a mentor for STEM students of underrepresented minorities outside of Boulder

Machine Learning STEM Camp, May 2021 – July 2021

- Developed and taught machine learning curriculum to high school students for a STEM summer camp

ADDITIONAL SKILLS AND INTERESTS

- Technical Languages: Python, MATLAB, C++, SQL, Mathematica, HTML, CSS
- Tools and Technologies: Unix/Linux, Git, Latex, Bash Shell
- CPR and First-Aid Certification
- Climbing gym route setter at University of Colorado Boulder (September 2020-Present)