HANNAH SUN

hannhjsun@gmail.com | LinkedIn: hnnahsun | github: hjuliasun | 805-807-5704

EDUCATION

Smith College **Northampton, MA**
B.A. ***Statistical & Data Sciences (SDS),*** *Minor* ***Astronomy*** *September 2021 – May 2025*

- **Relevant Courses:** Data Structures, Advanced Programming for Data Science, Multiple Regression & Linear Algebra, Modeling for Machine Learning, Human-Computer Interaction, Object-Oriented Programming, Astronomical Data Science, Methods of Biostatistics & Epidemiology, Information Systems, Computer Networks, SDS Capstone with Honda

SKILLS

Data Science: Python, Pandas, NumPy, Scanpy, Anndata, SQL, R, Java, Neo4j Cypher, Matplotlib
AI/ML: PyTorch, Tensorflow, OpenAI, BERT, Predictive Modeling, RAG, Differential Privacy, GAN
Misc: Leaflet, ArcGIS, AstroImageJ, orvara, Figma, Wireshark, ***Microsoft Emerging Leaders Program Fellow 2025***

PROFESSIONAL EXPERIENCE

MITRE **Bedford, MA**
Data Science Intern - Cyber Analytics *May 2024 – August 2024*

- Synthesized **Adversarial Machine Learning** (AML) literature findings and existing AI risk management frameworks (RMF) from **100+ page** white paper by MITRE industry experts. Authored a **20 page** actionable and **operational recommendation report** focused on countering **data poisoning attacks**, tailored for high-level government agency decision makers.
- Educated MITRE industry experts on **Data/AI governance compliances** (i.e **NIST AI RMF**) in the context of AML through presentations and knowledge-sharing initiatives.
- Enhanced and supported evaluation process of a **synthetic data generation** tool aligned with sponsor-specific use cases.
- Assessed and communicated vendor capabilities in **30+ page slide decks** for stakeholders and sponsors, providing deployment recommendations and **validation regimes**, and templated **test artifacts and strategies** to ensure robust evaluation of vendor capability releases.

Harvard University Department of Chemistry and Chemical Biology **Cambridge, MA**
Software Engineering Intern at Xiaowei Zhuang Lab *July 2023 – September 2023*

- Implemented attention-based, deep learning model, Geneformer, using Python to preprocess single-cell RNA sequencing data of hematopoietic systems. Extracted cell embeddings from **PyTorch BERT Pretrained model** following the in-silico perturbation of certain genes.
- Generated **28** visualizations and statistical tests using **anndata** and **Scanpy** to highlight potential disease evolutions in cells.

Smith College **Northampton, MA**
Substellar Lab Research Assistant *August 2022 – December 2024*

- Deployed **unsupervised machine learning and MCMC** to predict future brown dwarf orbital events/locations. Generated **54** visualizations that illustrate population distributions of orbital parameters using **NumPy** and **Pandas**. Improved accuracy of orbital model predictive power by **37%**.
- Presented research at American Astronomical Society (**AAS**) 243rd Conference, **STScI** Extrasolar Planetary Systems Imaging Group, Five College Colloquium at Amherst College and Smith research event: Collaborations.
- Authored paper on the computational methods of the **Python** package, **orvara**, and preliminary orbital models for GL 758 B and HD 19467 B using radial velocity and direct imaging data.

Lead Research Assistant - Exoplanet Transit Team TESS Follow-Up Observing Program (TFOP) *August 2022 – May 2024*

- Managed team of students to operate Smith's 16" Mead telescope to independently track and conduct observations on TESS targets and record their transits. Presented research at American Astronomical Society (AAS) 240th Conference.
- Employed **AstroImageJ CCD imaging** to process images using **multi aperture photometry** to fit light curves with RMS less than 2 mmag and analyzed resulting light curves to determine nearby eclipsing binaries.

Economics Research Assistant *June 2023 – December 2023*

- Developed a comprehensive **web scraping tool** in **R** to systematically collect occupational licensing literature from Google Scholar. Designed **ETL pipelines** and performed **geospatial analysis** on congressional districts spanning 1970-2016 using **Leaflet** to reveal gerrymandering and voter suppression practices in districts containing prison systems.

Information Technology Services (ITS) Research Assistant *October 2023 – May 2024*

- Implemented comprehensive frameworks and work programs for the new ITS Summer Internship based on case studies and interest groups. Directly oversaw screening and interview process, co-interviewing **3** candidates, and providing feedback for the final selection of **10** intern cohort.

United States Geological Survey (USGS) **St. Petersburg, FL**
Physical Science Technician *June 2022 – October 2022*

- Enhanced **ETL pipelines** for time-series oceanographic data, processed **ArcGIS** dataset and developed automated statistical tests arrays and interactive-graphical visualizations to assess the impact of constructed subtidal reefs using **regression analysis in R**. Enhance web app interface to streamline **data processing and visualization** of shoreline change.

U.S State Department and Embassy Federal Service **Remote**
Data Research Intern *April 2021 – May 2021*

- Utilized **analysis logic** and **artificial intelligence language processing/data scraping models** to collect and analyze data from academic texts to determine the outcome of visa applications.

Publications

Hannah Sun[1], Ash Messier[1], Dr. Kimberely Ward-Duong[1,2], Laurent Pueyo[2], Marshall Perrin[2], Emily Rickman[2], Jonathan Aguilar[2], Becca Michelson[1], Moiz Khalil[3] (2023). **Predicting Dynamical Mass Measurements from Orbital and Spectral Simulations of the Brown Dwarf Companion to GJ 758**. *American Astronomical Society. [1]Smith College, [2]Space Telescope Science Institute (STScI) [3]UMass Amherst.*

Hannah Sun, Gena Levin, James Lowenthal, Kari Berntson, Sophia Consiglio, Xinyun Guo, Alyssa Guzman, Lillian Jiang, Isabelle Leguelinel, Ashley Messier, Becca Michelson, Megan O'Brien, Zoe Roumeliotis, Olivia Siebert, Celine Wang, and Isabel Wolter (2022). **Follow-Up Observations of TESS Targets and Hot Jupiter Exoplanets.** *American Astronomical Society. Smith College.*