

INNOVATION ■ RESPONSIBLE AI ■ TECH TRANSFORMATION ■ STARTUPS

EXPERIENCE

WHITE HOUSE PRESIDENTIAL INNOVATION FELLOWS PROGRAM

PRESIDENTIAL INNOVATION FELLOW, TECHNOLOGY TRANSFORMATION SERVICES

Oct 2020 – present | 📍 Washington, DC (remote)

- Oct 2021 - present: Detailed to the U.S. Department of Labor's Office of the Chief Information Officer as an entrepreneur-in-residence. Developing a responsible AI framework for vetting AI applications with the Emerging Technology team via a pilot project reviewing bias and fairness in proposed AI technology for job matching Transitioning Service Members and spouses to civilian employment opportunities with the Veterans Employment and Training Service.
- Oct 2020 - Sep 2021: Detailed to the U.S. Department of Labor's Office of Disability Employment Policy as an entrepreneur-in-residence. Developing protocols to prevent algorithmic bias of HR-related AI tools against job seekers and employees with disabilities.
 - Delivered equitable AI tools including contributions to the "Combating Bias in AI Toolkit" for Federal agencies' use in mitigating bias and the Partnership on Employment and Accessible Technology's "AI and Disability Inclusion Toolkit: Implementing Equitable AI in the Workplace".
- Co-lead of federal government wide cross-agency AI Community of Practice and the working group on Responsible AI.
- Co-wrote proposal for General Service Administration's Technology Transformation Services artificial intelligence projects in response to White House executive orders.

HIGH ALPHA INNOVATION

SENIOR DATA SCIENTIST

Jul 2020 – Oct 2020 | 📍 Indianapolis, IN

- Partnered with organizations to innovate through startup creation, developing and validating data and analytic strategies for High Alpha Innovation's venture studio playbook.
- Designed data products and machine learning pipelines for pre- and post-launch software startups.

HIGH ALPHA STUDIO

DATA SCIENTIST / MACHINE LEARNING ENGINEER

Oct 2018 – Jun 2020 | 📍 Indianapolis, IN

- Led the design of architecture for cloud-based (GCP and AWS) data analysis pipelines and developed machine learning models for early-stage B2B SaaS companies in the High Alpha venture studio portfolio.
- Machine learning and data projects included classifier models, similarity-based recommendations systems, and lead scoring for several companies, including an AI marketing platform company, a software for software management company, an intelligent people directory product, and a product-led growth company.
- Designed and validated concepts, rapidly prototyped technology, and pitched business plans to investors as a "sprint week" team member, resulting in three launched and funded startups.

DATA INTENSIVE RESEARCH IN ASTROPHYSICS AND COSMOLOGY (DIRAC) INSTITUTE, UNIVERSITY OF WASHINGTON

RESEARCH SCIENTIST III, DATA MANAGEMENT, LEGACY SURVEY OF SPACE AND TIME, VERA RUBIN OBSERVATORY

Aug 2016 – Oct 2018 | 📍 Seattle, WA

- Architected a real-time data processing and analysis framework for terabytes of streaming astronomical data using Python, Kafka, Avro, Docker, and Prometheus and collaborated on system requirements documents in an Agile environment.
- Led the production deployment of said framework for the Zwicky Transient Facility's (ZTF) Survey alert stream distribution system, which processes data from one million changing objects in the sky each night and is hardened at 10x scale.

CENTER FOR DATA INTENSIVE SCIENCE, UNIVERSITY OF CHICAGO

DIRECTOR OF THE OPEN SCIENCE DATA CLOUD

Mar 2014 – Jul 2016 | 📍 Chicago, IL

- Program manager for a petabyte scale "data commons", managing an on-prem cloud (OpenStack) and cloud-based data science projects and services and interfacing with systems and software engineers in a matrix organization.
- Architected a 300 TB data hub as Technical Lead for the Open Commons Consortium on the NOAA Big Data Project.
- Organized an international data science and cloud computing summer fellowship program and supervised student projects.

RESEARCH PROFESSIONAL

Sep 2013 – Jul 2016 | 📍 Chicago, IL

- Managed and developed analytics for an automated machine learning pipeline for real-time cloud processing and analysis of daily acquired NASA satellite image data using Python, Hadoop, Accumulo, and Storm.
- Research projects include using R for detecting spatial patterns in geo-coded medical records and modeling data storage systems to analyze hardware performance issues.

EDUCATION

NEW MEXICO STATE UNIVERSITY | PHD, ASTRONOMY

May 2013 | 📍 Las Cruces, NM

UNIVERSITY OF CHICAGO | BA, WITH HONORS, PHYSICS WITH A SPECIALIZATION IN ASTROPHYSICS

May 2007 | 📍 Chicago, IL

SKILLS

Industry Specific Expertise

Entrepreneurship • Equitable AI
Machine learning pipelines
Production quality data engineering

Interpersonal

Cross-matrix organizations
Public speaking • Scientific writing
Public outreach • Mentoring

Technologies

Computing languages: Python, R, SQL
Open source: Docker, Kafka, Avro
Clouds: AWS, Google Cloud Platform

PROFESSIONAL ENGAGEMENT

Panelist, "Using Your Tech Skills In Public Service" — Tapia Celebration of Diversity in Computing Virtual | Sep 2021
Speaker, "Cloud architecture for the data scientist" — Indy Cloud Conf 2020 Indianapolis, IN | Jun 2020
Speaker, "Building a newsfeed from the Universe" — Kafka Summit 2019 San Francisco, CA | Oct 2019
Panelist, Careers in Science — Field Museum's 5th Annual Chicagoland Women in Science Mixer Chicago, IL | Oct 2019
Panelist, "Befriending failure" — Tapia Celebration of Diversity in Computing Atlanta, GA | Sep 2017
Speaker, "Building a community fountain around your data stream" — PyData 2017 Seattle, WA | Jul 2017
Panelist, "Turning Big Data into Big Opportunities" — Tapia Celebration of Diversity in Computing Austin, TX | Sep 2016

ADVISORY AND COMMITTEE SERVICE

Committee Member — AAS's Committee on the Status of Women in Astronomy (CSWA) Jun 2017 - Nov 2021

- Charged with providing recommendations to the American Astronomical Society Board of Trustees for practical measures that can be taken to improve the status of women in astronomy and encourage entry into the field.

Sub-group committee member — CSWA Strategic Plan Oct 2019 - Nov 2021

- Charged with writing a cascade model strategic plan, providing direction for the next 10 years of focus areas important to women in the astronomical community.

Sub-group committee member — CSWA Astro2020 Decadal Survey White Papers Jun 2019 - Dec 2019

- Co-authored two science white papers on state of the profession to the Astro2020 Decadal Survey on Astronomy and Astrophysics organized by the National Academy of Sciences.

Planning Committee — PyData Seattle Conference Jun - Jul 2017

- Scientific organizer and reviewer for conference speaker proposals.

Diversity Committee — PyData Seattle Conference Jul 2017

- Responsible for sponsorships and scholarships for underrepresented attendees.

VOLUNTEER EXPERIENCE AND EXTRACURRICULARS

Advisor — #BuiltByGirls WAVE Mentoring Program Jun 2019 - present
Member — American Astronomical Society's Committee on the Status of Women in Astronomy Jun 2017 - Nov 2021
Editor — AASWomen's Women in Astronomy Newsletter Aug 2016 - Nov 2021
Mentor — Tanzanian Data Lab + Grindstone Accelerator entrepreneur program Mar 2021
Mentor — Harvard Computer Society Tech for Social Good Entrepreneurship Wintersession Jan 2021
STEM gallery volunteer — The Children's Museum of Indianapolis, Beyond Spaceship Earth exhibit Aug 2019 - Mar 2020
Co-Organizer — PyLadies Seattle and PyData Seattle Meetup Groups Jan 2017 - Oct 2018
Mentor — New York Academy of Sciences NEXT Scholar Program Mar 2017 - Aug 2017
Distance Runner — 22 races including 1 marathon and 7 half marathons

HONORS AND AWARDS

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| 20th Century Fox and PepsiCo's "Search for Hidden Figures" in STEM, Hidden Figure Awardee in Professionals category | 2017 |
| Murrell Award for Professional Development and Research Accomplishment | 2013 |
| NMSU Outstanding Graduate Assistant Award (awarded twice) | 2009 & 2013 |
| Pegasus Award for Excellence in Teaching | 2010 |

SELECT PUBLICATIONS

Findings and Recommendations from the AAS Committee on the Status of Women in Astronomy:

Advancing the Career Development of Women in Astronomy

N. Zellner, J. McBride, N. Morrison, A. Olmstead, M.T. Patterson, G. Rudnick, A. Venkatesan, H. Flewelling, D. Grinspoon, J. D. Mink, C. Richey, A. Speck, C. A. Thomas, S. E. Tuttle

Published in: Bulletin of the American Astronomical Society, Vol. 51, Issue 7, id. 170 (2019)

Findings and Recommendations from the AAS Committee on the Status of Women in Astronomy:

Towards Eliminating Harassment in Astronomy

N. Zellner, J. McBride, N. Morrison, A. Olmstead, M.T. Patterson, G. Rudnick, A. Venkatesan, H. Flewelling, D. Grinspoon, J. D. Mink, C. Richey, A. Speck, C. A. Thomas, S. E. Tuttle

Published in: Bulletin of the American Astronomical Society, Vol. 51, Issue 7, id. 169 (2019)

The Zwicky Transient Facility Alert Distribution System

M.T. Patterson, E.C. Bellm, B. Rusholme, F.J. Masci, M. Juric, K.S. Krughoff, V.Z. Golkhou, M.J. Graham, S.R. Kulkarni, G. Helou, Zwicky Transient Facility Collaboration

Published in: Publications of the Astronomical Society of the Pacific, Nov 2018, Vol. 131, Iss. 995

Detecting Spatial Patterns of Disease in Large Collections of Electronic Medical Records Using Neighbor-Based Bootstrapping

M.T. Patterson and R.L. Grossman

Published in: Big Data, Sep 2017, Vol. 5, No. 3

The Case for Data Commons: Towards Data Science as a Service

R.L. Grossman, A. Heath, M. Murphy, M.T. Patterson, W. Wells

Published in: Computing in Science Engineering special issue: Science as a Service, Sep 2016, Vol. 18, Issue 5