Monica G. Bobra

Principal Data Scientist

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Summary

I lead teams that develop novel machine learning algorithms and apply them to complex data to glean insights and inform decision-making. I develop open data and open source scientific software for data-intensive research. I provide expertise on the practice of data science by publishing papers, giving talks, briefing legislators, organizing conferences, developing new communities, mentoring students, and serving on committees and boards.

Education

University of New Hampshire, Durham NH
M.S. Physics
JANUARY 2010

Boston University, Boston MA
B.A. Astronomy
B.S. Communication
MAY 2004

Skills

Python scientific software stack

Machine learning model development together with interpretability tools

Statistical modeling

Data visualization

Cloud computing

Git (and CI/CD)

Awards

Robert H. Goddard Exceptional Achievement for Science Award (2024)

NASA Group Achievement Award — SunPy Development Team (2024)

American Astronomical Society Solar Physics Division Popular Media Award (2021)

NASA Group Achievement Award — Solar Dynamics Observatory Team (2017)

Robert H. Goddard Exceptional Achievement for Science Award (2016)

NASA Space Grant Fellowship (2008 - 2009)

NASA Group Achievement Award — Hinode Team (2007)

Experience

State of California, Office of Data and Innovation / Principal Data Scientist
MAY 2023 - PRESENT, SACRAMENTO & SAN FRANCISCO BAY AREA, CA

Serving as the data science methodology expert for the State of California, as appointed by Governor Newsom

Leading data science teams with partner departments across the state to develop models that improve safety, sustainability, and decision-making

Briefing legislators on best practices in ethical data science

Serving on advisory boards at academic institutions, including NASA/JPL and Stanford University, to effectively translate advances in research to improvements in operations across the State of California

Stanford University / Research Scientist
APRIL 2010 - JULY 2021, STANFORD CA

Published several first-author studies and presented talks about using petabyte-scale, multi-spectral image data taken by NASA observatories, together with novel machine learning algorithms, to predict space weather and its impact on society

Led two groups, both spanning multiple academic institutions and federal agencies, to predict space weather using machine learning methods as acting PI of NSF and NASA grants ($1.8M total award)

Wrote science policy to inform the direction of data science at a federal level as a member of the National Academy of Sciences Heliophysics Mid-Decadal Committee (2020)

Led the development of open source software as Vice-Chair of the Board for SunPy, a founding member of the Python in Heliophysics community, and an editor for the Journal of Open Source Software

Led a culture of open scholarship at Stanford Data Science as a founding member of the Center for Open and REproducible Science

Harvard-Smithsonian Center for Astrophysics / Astrophysicist
OCTOBER 2005 - AUGUST 2007, CAMBRIDGE MA

Developed and published a numerical model of the solar magnetic field that accurately replicates observational data

Designed and conducted flight hardware tests and flight operations for the JAXA/NASA Hinode X-Ray Telescope