Isaac Shivvers

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I'm a data-driven scientist with a background in observational astrophysics, looking to apply my skills to a new set of challenges. I bring a proven track record of computationally-driven scientific research utilizing state-of-the-art machine learning and statistical modeling methodologies, and I'm an experienced communicator of complex processes to non-technical audiences.

ishivvers.com
github.com/ishivvers
linkedin.com/in/ishivvers

Ph.D. UC Berkeley, Astrophysics, Spring 2017

- **Built custom analytical systems** to reveal and interpret the physical properties of astrophysical phenomena via the statistical analysis of large observational data sets. My work involved processing archival data sets; obtaining new observations and comparing them to archival data; constructing computational physics models; machine-learned classifications, clustering, and anomaly detection; and sharing my new findings with the astrophysics community.
- **Published 4 peer-reviewed articles as lead author** analyzing the diversity of supernova explosions arising from the deaths of massive stars. Projects included evaluating statistical properties of supernova populations and investigating the physics governing individual representative supernovae in depth.
- **Created online data visualizations** (using d3.js, Python Flask, SQL, and other tools) to help lay audiences and other researchers explore and catalog astrophysical phenomena. (Some of these projects can be seen at `ishivvers.com/maps`.)
- **Designed and led a 2-year observational project**, managing a team of researchers and students utilizing the 3-meter telescope at Lick Observatory.
- **Managed and maintained computational resources** for my research group, including two Linux servers that housed 8 terabytes of data across multiple RAID arrays. Helped create and manage our public-facing websites and a group wiki.
- **Co-authored 15+ peer-reviewed articles** and led or assisted with 40+ conference proceedings and other publications.
- **Presented original work at 7 international astrophysics conferences** in the United States and abroad. Regularly presented findings to astrophysicists at Berkeley and frequently spoke at donor and student events throughout the Bay Area.
- **Mentored 8 students**, both undergraduate and graduate. Provided training in the operation of research telescopes and spectrographs, in the complexities of astrophysical data reduction, and in the physics of supernovae, alongside more general guidance.
- **Led or assisted with 10+ successful proposals** for the use of major telescopes, including the Hubble Space Telescope and those at the Keck and Lick Observatories.

M.A. UC Berkeley, Astrophysics, Spring 2013

- **Published a peer-reviewed article as lead author** analyzing a population of rare stars discovered via our application of a random forest classifier.
- **Led classes and laboratory sessions as a teaching assistant** for several courses, including Python Computing for Data Scientists, Intro to General Astronomy, and a roughly-annual Python Bootcamp.

B.A. Harvard, Astrophysics, Spring 2011

- **Graduated Cum Laude** with a minor in Earth & Planetary Sciences.
- **Published a peer-reviewed article as lead author** presenting a statistical analysis of radio-wavelength gamma-ray burst observations.
- **Built, deployed, and tested a robotic atmospheric monitor telescope**, leading to co-authorship on a peer-reviewed article.
- **Led laboratory sessions as a teaching assistant**

Work Examples

- **Links to all of my published research articles** can be found at `ishivvers.com` and `linkedin.com/in/ishivvers`
- **The Berkeley Supernova Database**, which I built to explore data internally and share public data releases, can be found at `heracles.astro.berkeley.edu/sndb/`
- **Data visualizations** I developed to help lay audiences explore astrophysical phenomena can be found at `ishivvers.com/maps`
- **Various scientific computing codes** can be found at `github.com/ishivvers`

Skills

- **Machine Learning:** supervised and unsupervised learning, clustering, classification, regression, feature reduction
- **Python:** scientific computing, data visualization, web apps, data management, scikit-learn, Jupyter, NumPy, pandas
- **High-performance computing:** use of queue-scheduled clusters; parallelization across CPUs, GPUs, and FPGAs
- **Large datasets:** MySQL, PostgreSQL, MongoDB
- **UNIX/Linux:** administration and maintainance
- **Writing & presentation:** sharing results and explaining technical topics to both expert and lay audiences
- **Project management:** running complex, long-term research projects involving international and cross-disciplinary collaborators
- **Teaching and mentoring:** 8 years of experience at Harvard and Berkeley as an instructor in technical fields

Honors, Awards & Fellowships

- Berkeley Graduate Division Conference Travel Awards, 2014 & 2016
- American Astronomical Society Int'l Travel Award, 2014
- Anselmo J. Macchi Fellowship Fund, 2013
- Nat'l Science Foundation Graduate Research Fellowship Honorable Mention, 2013
- Harvard University PRISE Fellow, 2010
- Harvard College Research Program Fellow, 2009
- National Merit Scholar, 2006-2010
- National AP Scholar, 2006