Data Science in Manufacturing

James A. Bednar

ANACONDA.

Education: UT Austin

1993 BS Electrical Engineering
1994 BA Philosophy
2002 PhD Computer Science
2004 Postdoc Computational Neuroscience

Seems crazy, but always focused on building systems as cool as the brain.

(Also partly hedging my bets, in case science didn't work out!)

Faculty: U. Edinburgh Informatics

THE UNIVERSITY *of* EDINBURGH

2004 Lecturer
2012 Senior Lecturer
2014 Reader

Academia cares about grants, papers, students, and impact:

- Director, Doctoral Training Centre in Neuroinformatics ($8M)
- Published 50 papers, 1 book, 2 edited books, hundreds of posters
- Supervised 10 PhD, 19 MSc, 15 UG theses

- Also built open-source Python tools for computational neuroscience (*Param, Topographica, ImaGen, HoloViews*)
- Only 20% of PhDs stay in science.
  Regularly asked to talk about industry jobs, but had no idea!

Industry: Anaconda, Inc

2015 Solutions Architect
2019 Manager of Technical Services
2021 Director of Custom Services

Industry cares about money, solutions, and value:

- $10M or so in funding so far from government and corporate sources
- All our work is based on open source software (OSS)
- Money goes to salaries for engineers improving OSS and applying OSS to solve problems
- Hired three of my ten PhD students (and still have two)
- Together we help improve tools for data science, while working on interesting problems that keep my team motivated

Transition to industry

- My wife wanted to see the sun again and have a back yard
- And have a plausible retirement plan
- Couldn’t find a faculty position that fit the bill
- Knew about Anaconda and Enthought from years of SciPy Austin
- Interviewed at both, got the job at Anaconda, never looked back!

- All that time writing low-impact papers was fairly useless
- Hundreds of thousands of people download our software every month
- Becoming critical infrastructure for climate science
  (due to large, remote datasets involved)
- Working closely with clients to apply data science to manufacturing
- Now also coming back to brain science, funded by Zuckerberg

HoloViz.org provides a set of compatible tools to make it easier to see, understand, and communicate your data, at every stage from discovery to publication.


Panel

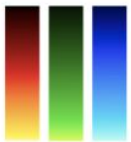

hvPlot


HoloViews


GeoViews


Datashader


Param

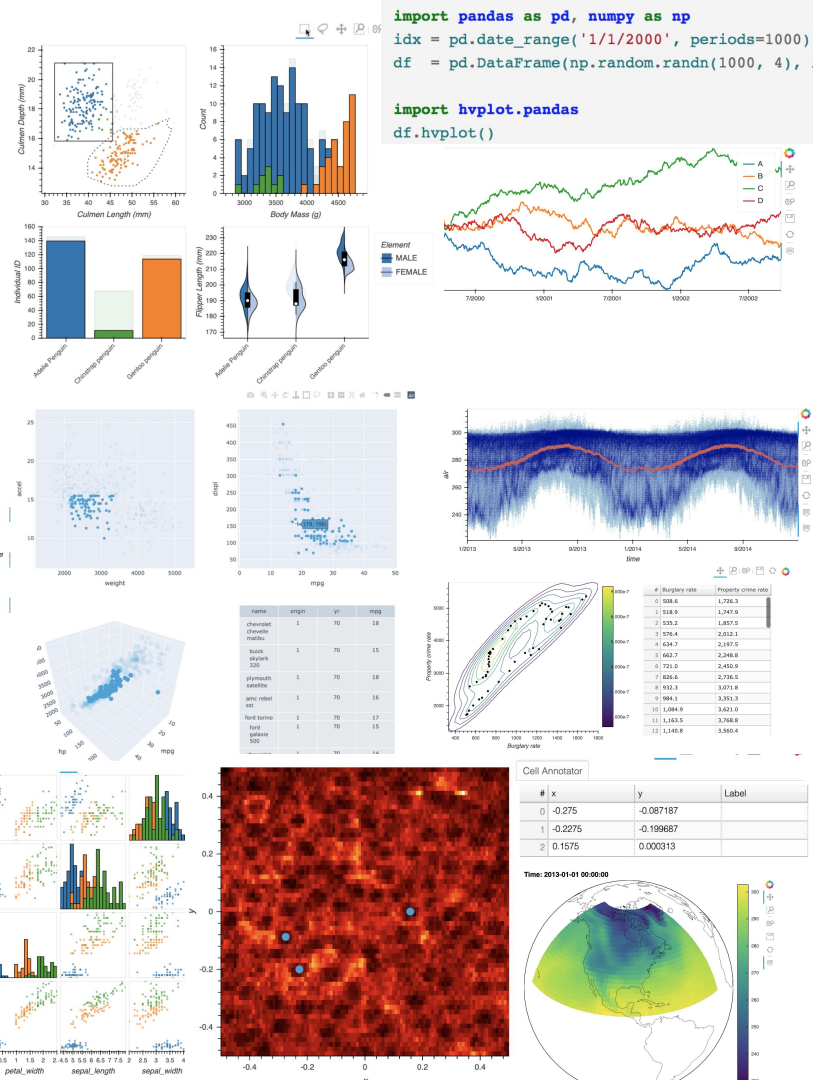

Colorcet

HoloViews hvPlot

High-level viz/analysis for Bokeh/MPL/ Plotly

[hvPlot](): Interactive plots from Pandas .plot()

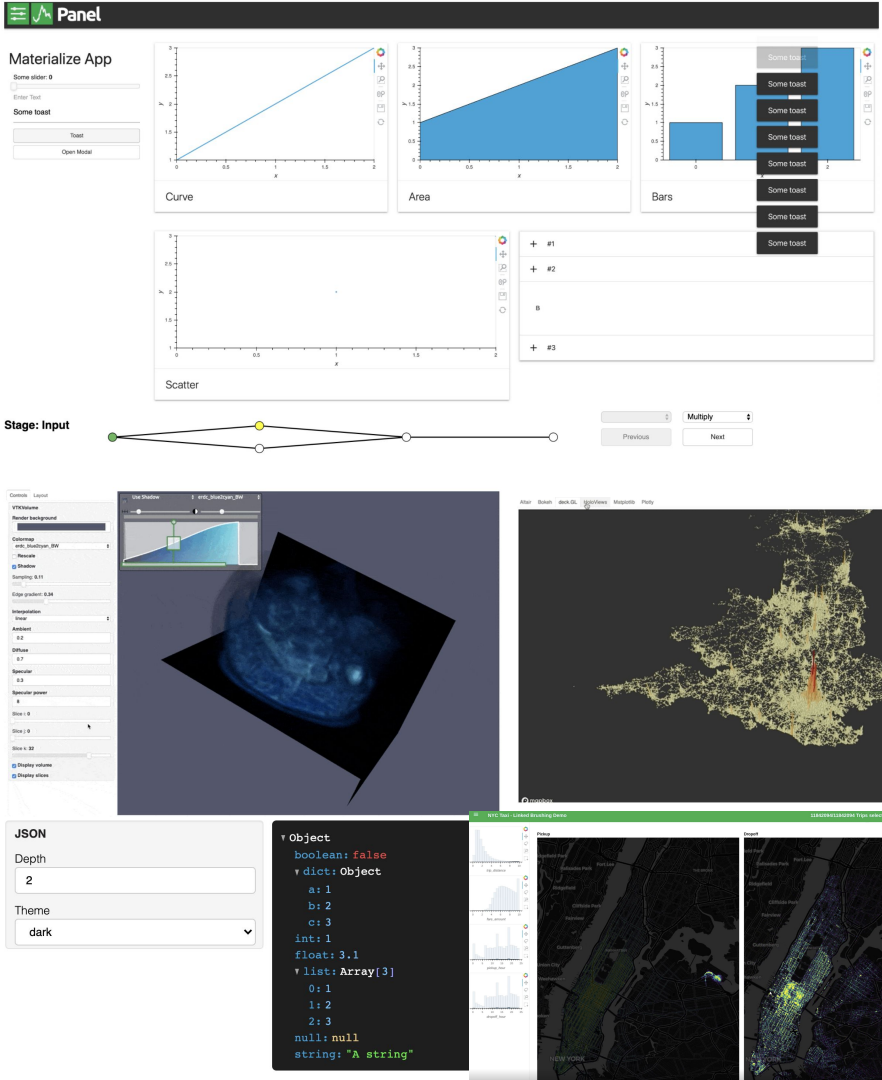
- Describe your data once, then get plotting for free
- Developed for our academic work
- Now used to build dashboards for corporate clients



Panel

Easy apps and dashboards for any viz library.

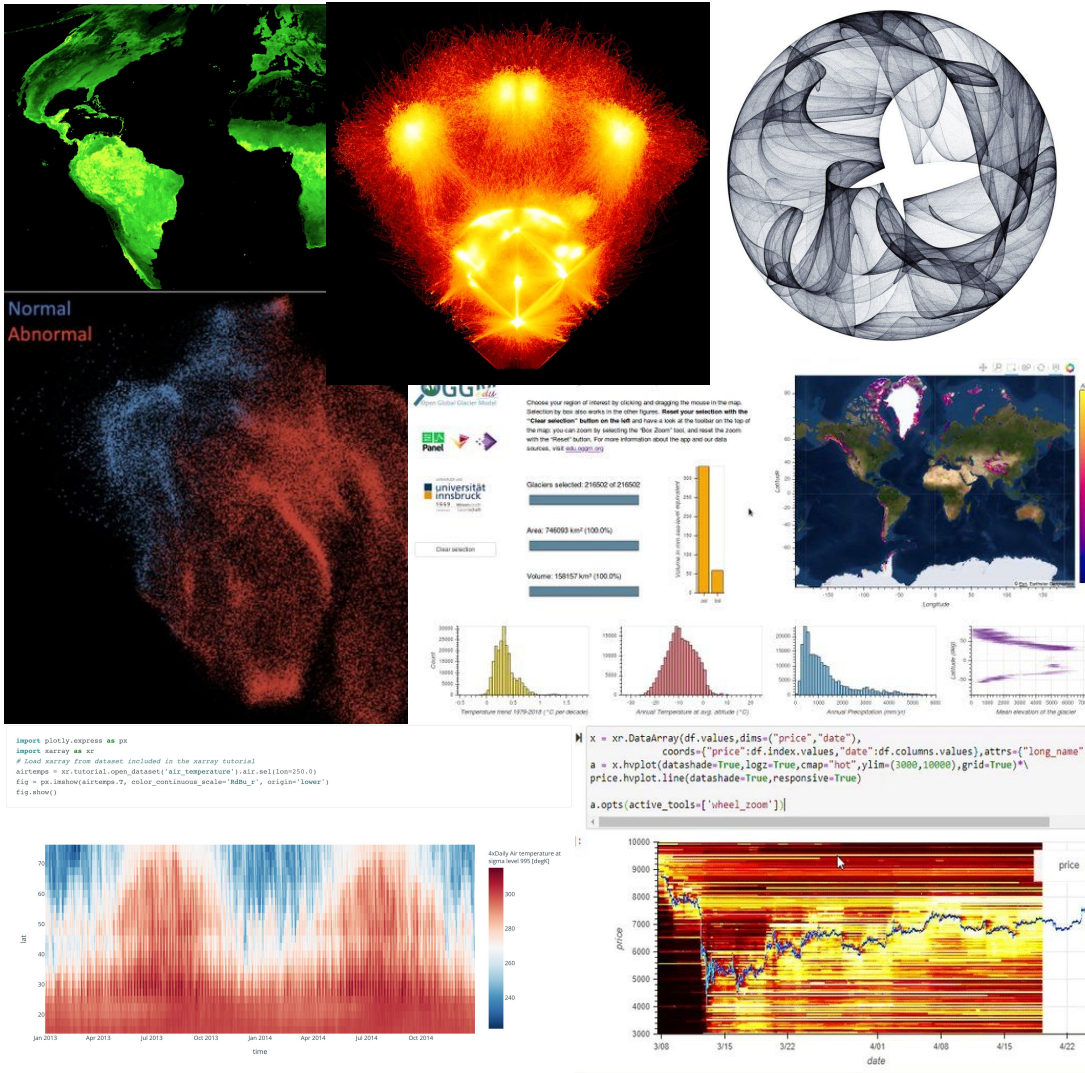
- Fully reactive, Pythonic API for Jupyter or standalone use
- Makes it simple to add widgets to control any plot or table
- Supports nearly all plotting libraries
- Provides fully responsive multi-page apps



Datashader

Accurate server-side rendering of the largest datasets

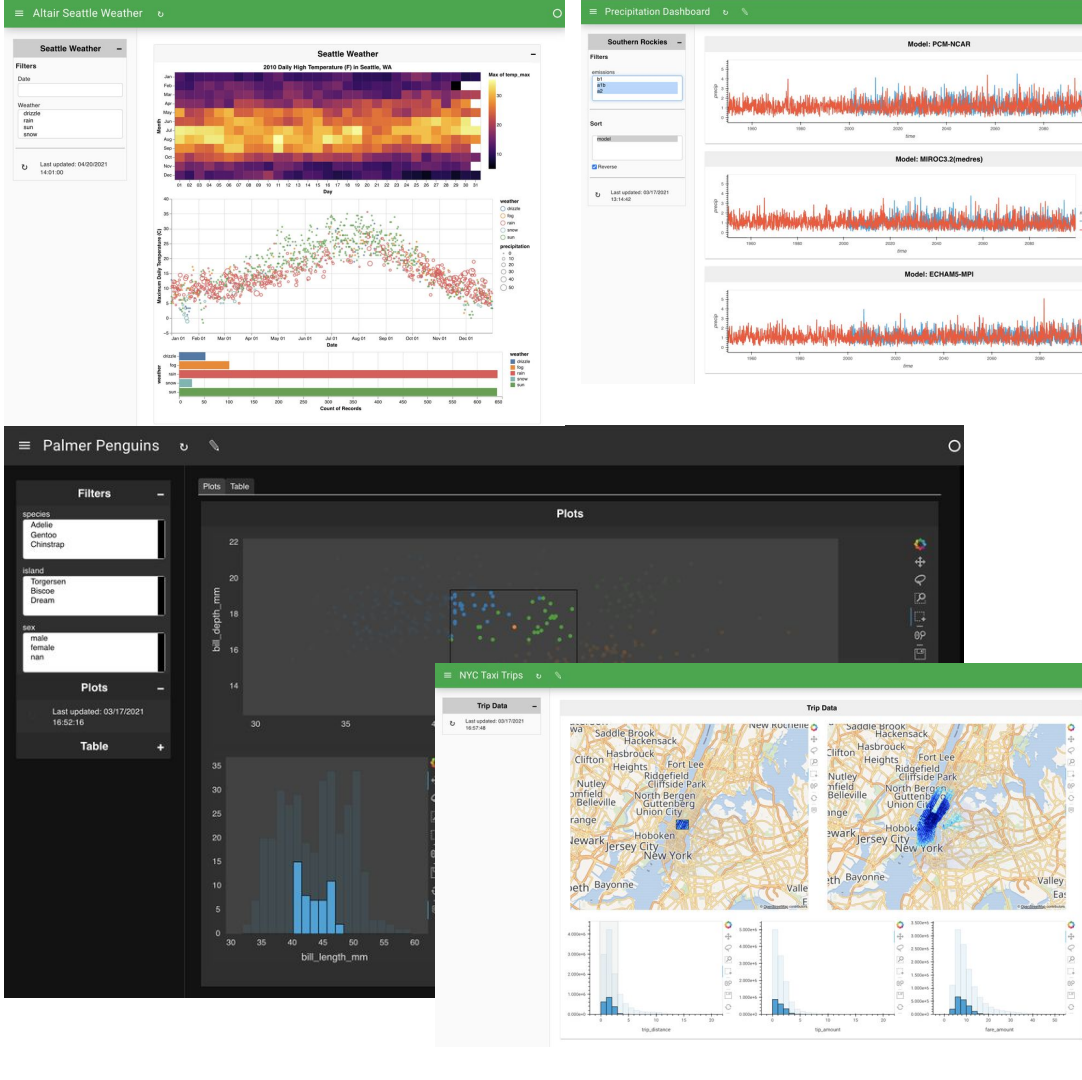
- Renders data as arrays or images
- Makes working with “big data” practical on a laptop
- Scales up to large and/or remote datasets



Lumen

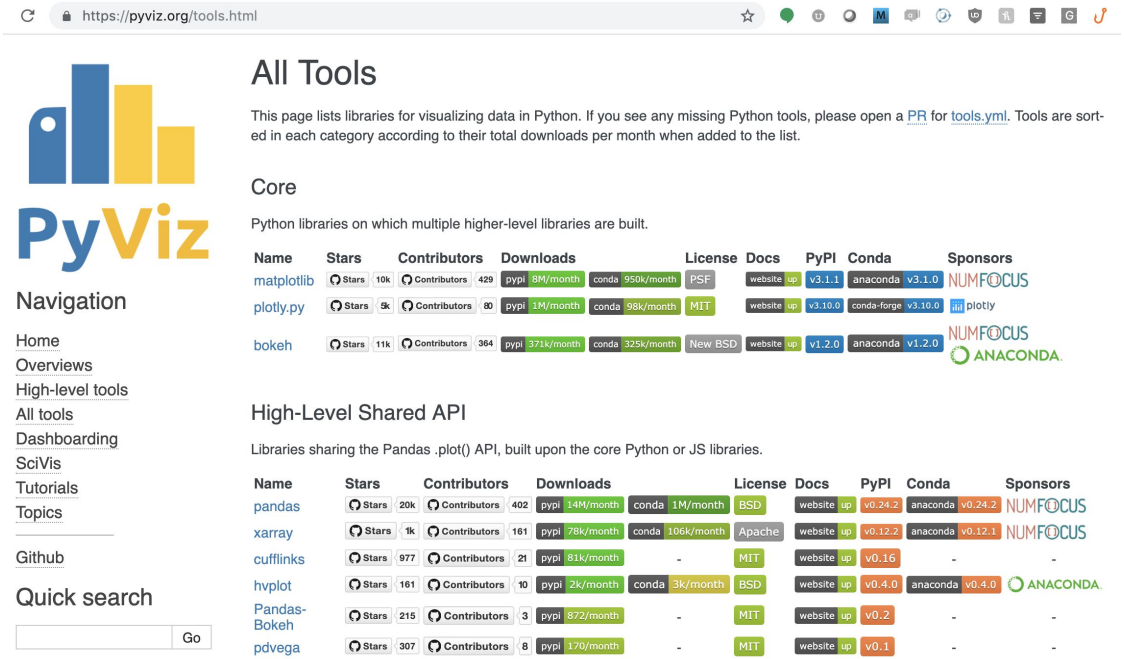
Low-code or no-code dashboarding and plotting

- Declarative .yml specification for data sources, transforms, filters, and views
- GUI Builder tool
- Extensible in Python
- The power of HoloViz, for everyone!



Also see PyViz.org

- An open, non-partisan guide to Python Viz libraries.
- Live status of 90+ tools
- Overviews, comparisons, tutorials



Demos

- Introduction: How to make plots
- Interactive: How to make apps and dashboards
- examples.pyviz.org: In-depth examples
- HoloViz.org: In-depth tutorial
- Also see hvplot.HoloViz.org, or contact me at:

jbednar@anaconda.com  @JamesABednar  jbednar