astroML 2.0: Machine Learning for Astrophysics

Brigitta Sipőcz¹ with Andrew Connolly¹, Željko Ivezić¹, Jake VanderPlas²,³

¹DIRAC Institute, University of Washington ²Google ³eScience Institute, University of Washington

@bsipocz @AstroBrigi
Python is the most popular language in astronomy

Python overtook and became the most used language

Established scientific packages (e.g. numpy, scipy, matplotlib, scikit-learn, astropy)

Adapted from: Nunez-Iglesias, Robitaille, Beaumont
astroML in a nutshell

- Example driven approach, python code is available for every figure
- Provides recipes for powerful analysis, useful for education and research
- Coherent set of examples of data processing are using real data
- Move tested, useful, and generic code upstream for wider use.
Current state

- v0.4 release candidate on PyPI as of today
  - compatible with the latest versions of dependencies

- Many things made it upstream to scikit-learn, scipy and astropy
  - examples are updated accordingly
  - implementations in astroML have been deprecated and will be removed in the future
New features on the roadmap

- Hierarchical Bayesian modeling
- Approximate Bayesian computation
- Incorporating uncertainty
- Interface for deep learning
- Scaling to large datasets
Community

- **astroML** is widely used in the astronomy community and beyond.

- Documentation, and rendered figures [www.astroML.org](http://www.astroML.org)

- Code and issue tracker on GitHub: [https://github.com/astroML/astroML](https://github.com/astroML/astroML)

- Feedback is welcome on missing features not available elsewhere in the ecosystem