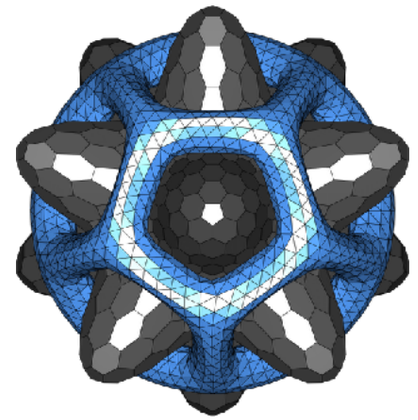


Introducing JOSS: The Journal of Open Source Software

Arfon M Smith, Lorena A Barba, George Githinji, Melissa Gymrek, Kathryn D Huff, Daniel S Katz, Christopher R Madan, Abigail Cabunoc Mayes, Kevin M Moerman, **Kyle E Niemeyer**, Pjotr Prins, Karthik Ram, Ariel Rokem, Tracy K Teal, Roman Valls Guimera, Jacob T Vanderplas

SciPy 2017
13 July 2017
Austin, TX

tl;dr

- JOSS publishes (short) software articles; basically metadata + code
- Peers review article, software, and associated artifacts
- JOSS has an ISSN (2475-9066) and software articles receive Crossref DOI upon publication
- JOSS celebrated its first birthday in May 🎂
- 111 articles published in first year
- Now: 122 published articles and 57 under review

Preprint available!

Computer Science > Digital Libraries

Journal of Open Source Software (JOSS): design and first-year review

Arfon M Smith, Kyle E Niemeyer, Daniel S Katz, Lorena A Barba, George Githinji, Melissa Gymrek, Kathryn D Huff, Christopher R Madan, Abigail Cabunoc Mayes, Kevin M Moerman, Pjotr Prins, Karthik Ram, Ariel Rokem, Tracy K Teal, Roman Valls Guimera, Jacob T Vanderplas

(Submitted on 7 Jul 2017)

This article describes the motivation, design, and progress of the Journal of Open Source Software (JOSS). JOSS is a free and open-access journal that publishes articles describing research software. It has the dual goals of improving the quality of the software submitted and providing a mechanism for research software developers to receive credit. While designed to work within the current merit system of science, JOSS addresses the dearth of rewards for key contributions to science made in the form of software. JOSS publishes articles that encapsulate scholarship contained in the software itself, and its rigorous peer review targets the software components: functionality, documentation, tests, continuous integration, and the license. A JOSS article contains an abstract describing the purpose and functionality of the software, references, and a link to the software archive. The article is the entry point of a JOSS submission, which encompasses the full set of software artifacts. Submission and review proceed in the open, on GitHub. Editors, reviewers, and authors work collaboratively and openly. Unlike other journals, JOSS does not reject articles requiring major revision; while not yet accepted, articles remain visible and under review until the authors make adequate changes (or withdraw, if unable to meet requirements). Once an article is accepted, JOSS gives it a DOI, deposits its metadata in Crossref, and the article can begin collecting citations on indexers like Google Scholar and other services. Authors retain copyright of their JOSS article, releasing it under a Creative Commons Attribution 4.0 International License. In its first year, starting in May 2016, JOSS published 111 articles, with more than 40 additional articles currently under review. JOSS is a sponsored project of the nonprofit organization NumFOCUS and is an affiliate of the Open Source Initiative.

Comments: 19 pages, 7 figures
Subjects: **Digital Libraries (cs.DL)**; Software Engineering (cs.SE)
Cite as: arXiv:1707.02264 [cs.DL]
(or arXiv:1707.02264v1 [cs.DL] for this version)

Arfon M Smith, Kyle E Niemeyer, Daniel S Katz, Lorena A Barba, George Githinji, Melissa Gymrek, Kathryn D Huff, Christopher R Madan, Abigail Cabunoc Mayes, Kevin M Moerman, Pjotr Prins, Karthik Ram, Ariel Rokem, Tracy K Teal, Roman Valls Guimera, and Jacob T Vanderplas. “Journal of Open Source Software (JOSS): design and first-year review.” 2017. arXiv:1707.02264 [cs.DL]

Today's talk

Motivation behind JOSS

↓

Overview

↓

Business model

↓

Review process

↓

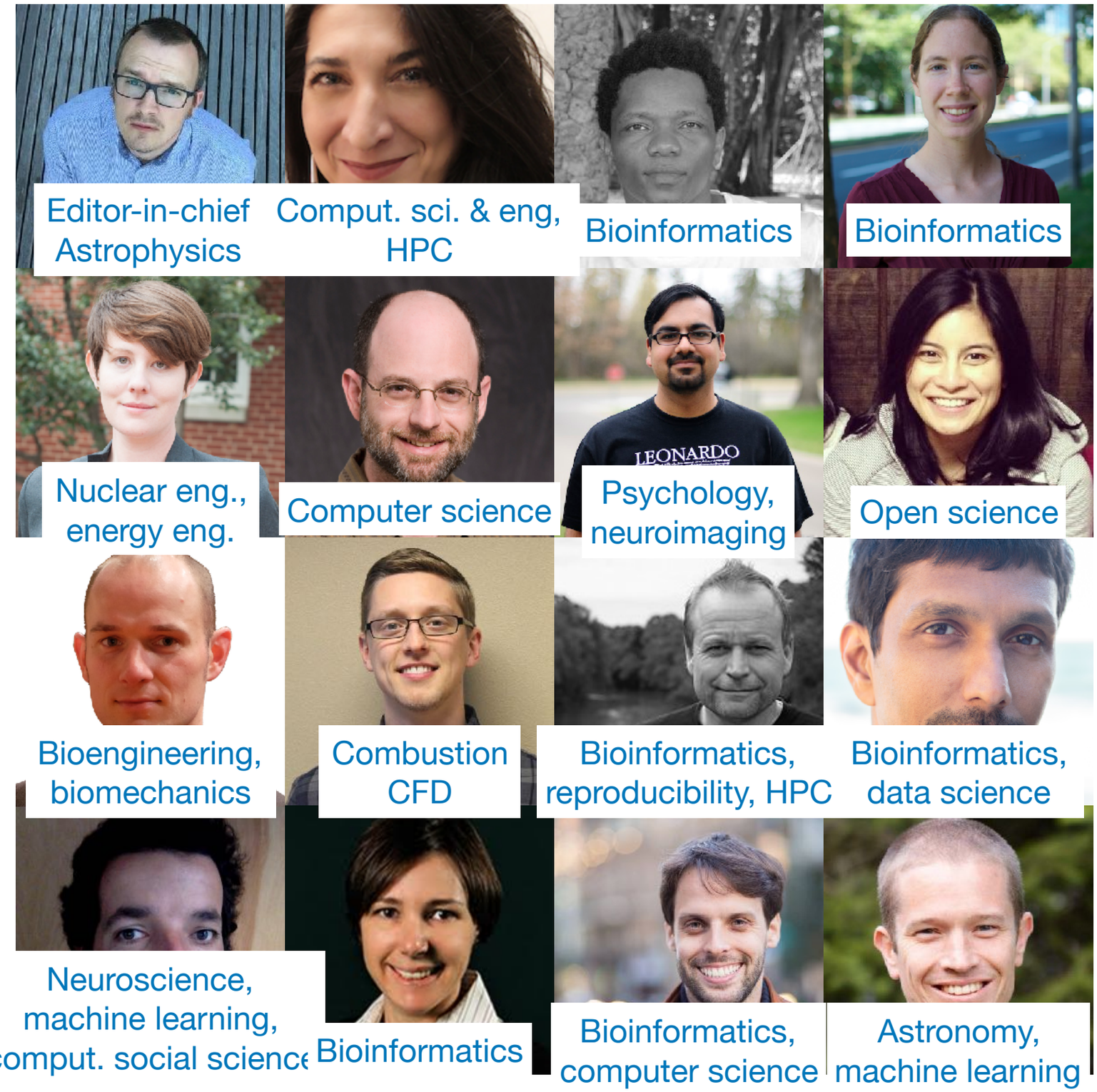
First-year stats

↓

What's next?

Who are we?

Who are we?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reproducibility, HPC
Bioinformatics,
data science
Neuroscience,
machine learning,
comput. social science
Bioinformatics
Bioinformatics,
computer science
Astronomy,
machine learning

Why?

The stats:

- 2009: **91%** scientists consider research software important/very important[1]
- UK academics in 2014: **90%** use software in research; **70%** of them would find research impractical without it[2]
- US postdocs in 2017: **95%** / **63%** same[3]

[1] JE Hannay, HP Langtangen, et al. SECSE 2009. Vancouver, BC, 1–8. https://doi.org/10.1109/SECSE.2009.5069155

[2] S Hettrick et al. *UK Research Software Survey 2014*. (2015) https://doi.org/10.7488/ds/253

[3] U Nangia & DS Katz, WSSSPE 5.1 (2017) https://doi.org/10.5281/zenodo.814102

… ok, and?

- Academia generally relies on (article) citations for credit
- Jon Claerbout (by way of Buckheit and Donoho): “An article about a computational result is **advertising**, not scholarship. The actual scholarship is the full software environment, code and data, that produced the result.”[1]
- OK, so we can publish software articles—but where? And “worth” the (possibly significant) extra work?

[1]B Buckheit & DL Donoho. “WaveLab and Reproducible Research”. In: Wavelets and Statistics. Eds. A Antoniadis & G Oppenheim. New York, NY: Springer, 1995, pp. 55–81. https://doi.org/10.1007/978-1-4612-2544-7_5

Enter: JOSS

- Submission: brief summary article + software itself
- Submission undergoes thorough peer review, including article, code, documentation, contributing guidelines, etc.
- Upon acceptance, article is archived and receives Crossref DOI

Requirements

Software must:

- be open source by the Open Source Initiative (OSI) definition (open-source.org)

- have a research application

- be a significant new contribution to the available open-source software that either enables some new research challenge(s) to be addressed or makes addressing research challenges significantly better

- be feature-complete

Submitter must be a major contributor to the software

JOSS components

- JOSS web application & submission tool @ http://joss.theoj.org: Ruby on Rails application

- Open peer review on GitHub: `joss-reviews` repository

- `Whedon` RubyGem library manages submitted manuscript, `Whedon-API` bot handles review tasks

Business model (1/2)

Costs:

- *Open Journals* Crossref membership: $275 / year
- Minting Crossref DOIs: $1 / article
- JOSS web hosting (Heroku): $19 / month
- Publishing software articles with minimal extra work: priceless.

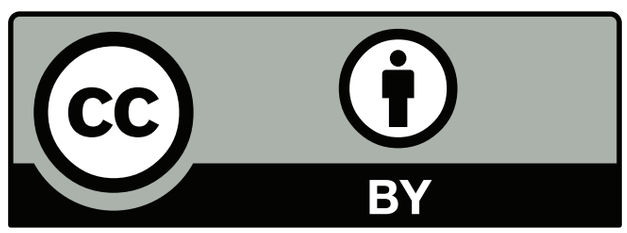
100 articles per year: ($275 + ($1 × 100) + ($19 × 12)) / 100 = **$6.03**

200 articles per year: ($275 + ($1 × 200) + ($19 × 12)) / 100 = **$3.51**

Business model (2/2)

Licensing/permissions:

- Authors retain copyright; accepted articles published under CC-BY 4.0 International
- Code snippets in articles subject to MIT license
- Software itself must be under OSI-approved license



`https://creativecommons.org/licenses/by/4.0/legalcode`

The Journal of Open Source Sc ×

Arfon

joss.theoj.org/papers/new

The Journal of Open Source Software

Submit Papers About **Arfon Smith** · Sign out

Submit software for review

Before you submit
Please make sure you've read the submission instructions before submitting. In particular please make sure there is a `paper.md` present in your repository that is structured like this. We promise this will make things go much more quickly during the review process

Title

What's the title of this paper?

Repository address

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Software version

e.g. v1.0.0

Suggested editor. View editors here »

Suggested editor

Description

Please give short (1-2 line) description of your software.

I certify that I am submitting software for which I am a primary author

I confirm that I read and will adhere to the JOSS code of conduct

Submit paper

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article.md

```
---
title: 'Fidgit: An ungodly union of GitHub and figshare'
tags:
  - example
  - tags
  - for the paper
authors:
 - name: Arfon M Smith
   orcid: 0000-0000-0000-1234
   affiliation: 1
 - name: Mickey Mouse
   orcid: 0000-0000-0000-1234
   affiliation: 2
affiliations:
 - name: Space Telescope Science Institute
   index: 1
 - name: Disney Inc.
   index: 2
date: 14 February 2016
bibliography: paper.bib
---

# Summary

This is a proof of concept integration between a GitHub [@GitHub] repo and figshare
[@figshare] in an effort to get a DOI for a GitHub repository. When a repository is
tagged for release on GitHub, Fidgit [@Fidgit] will import the release into figshare
thus giving the code bundle a DOI. In a somewhat meta fashion, Fidgit is publishing
itself to figshare with DOI 'http://dx.doi.org/10.6084/m9.figshare.828487'
[@figshare_archive].

-![Fidgit deposited in figshare.](figshare_article.png)

# References
```

Make software available in repository with OSI-approved license 🍺: `https://opensource.org/licenses`

Author short Markdown paper: `paper.md`

Submit to JOSS by filling out short form

JOSS Submitted

Editor assigns ≥1 reviewers, who review submission 🔍

JOSS Under review

Reviewer(s) raise comments and issues following guidelines 👀: `http://joss.theoj.org/about#reviewer_guidelines`

Authors fix issues 👩‍💻

Editor accepts paper, authors archive software ✔

Paper published & receives JOSS DOI ⚡

JOSS 10.21105/joss.#####

Review criteria (1/2)

- Conflict of interest
- Code of Conduct
- General checks
  - Available at **Repository**
  - OSI-approved **License**
  - Match **Version**
  - **Authorship**
- Functionality
  - **Installation**
  - **Functionality**
  - **Performance**

Review criteria (2/2)

- Documentation
  - **A statement of need**
  - **Installation instructions**
  - **Example usage**
  - **Functionality documentation**
  - **Automated tests**
  - **Community guidelines**
- Software paper
  - **Authors**
  - **A statement of need**
  - **References**

Code of Conduct

Contributor Covenant Code of Conduct

Our Pledge

In the interest of fostering an open and welcoming environment, we as contributors and maintainers pledge to making participation in our project and our community a harassment-free experience for everyone, regardless of age, body size, disability, ethnicity, gender identity and expression, level of experience, nationality, personal appearance, race, religion, or sexual identity and orientation.

Our Standards

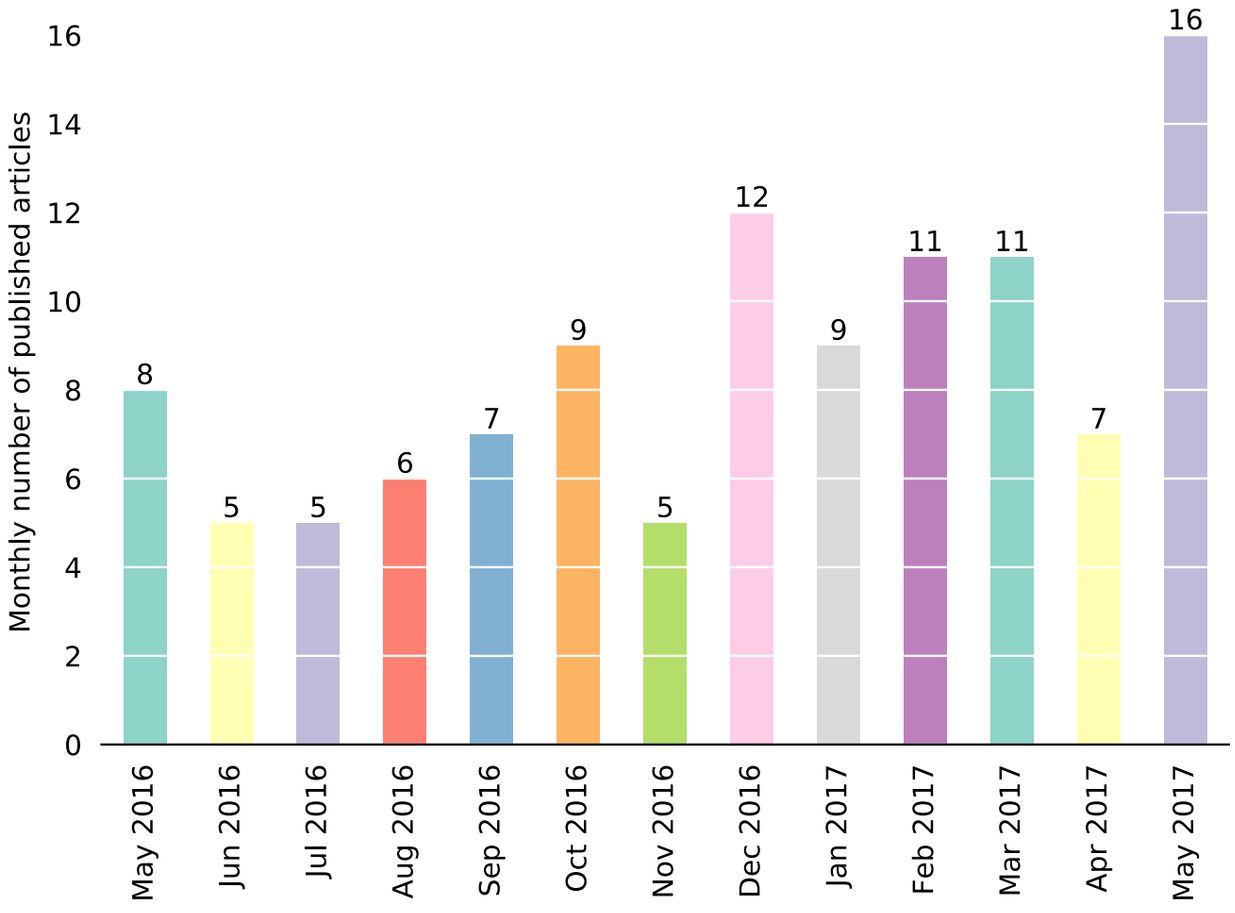
Examples of behavior that contributes to creating a positive environment include:

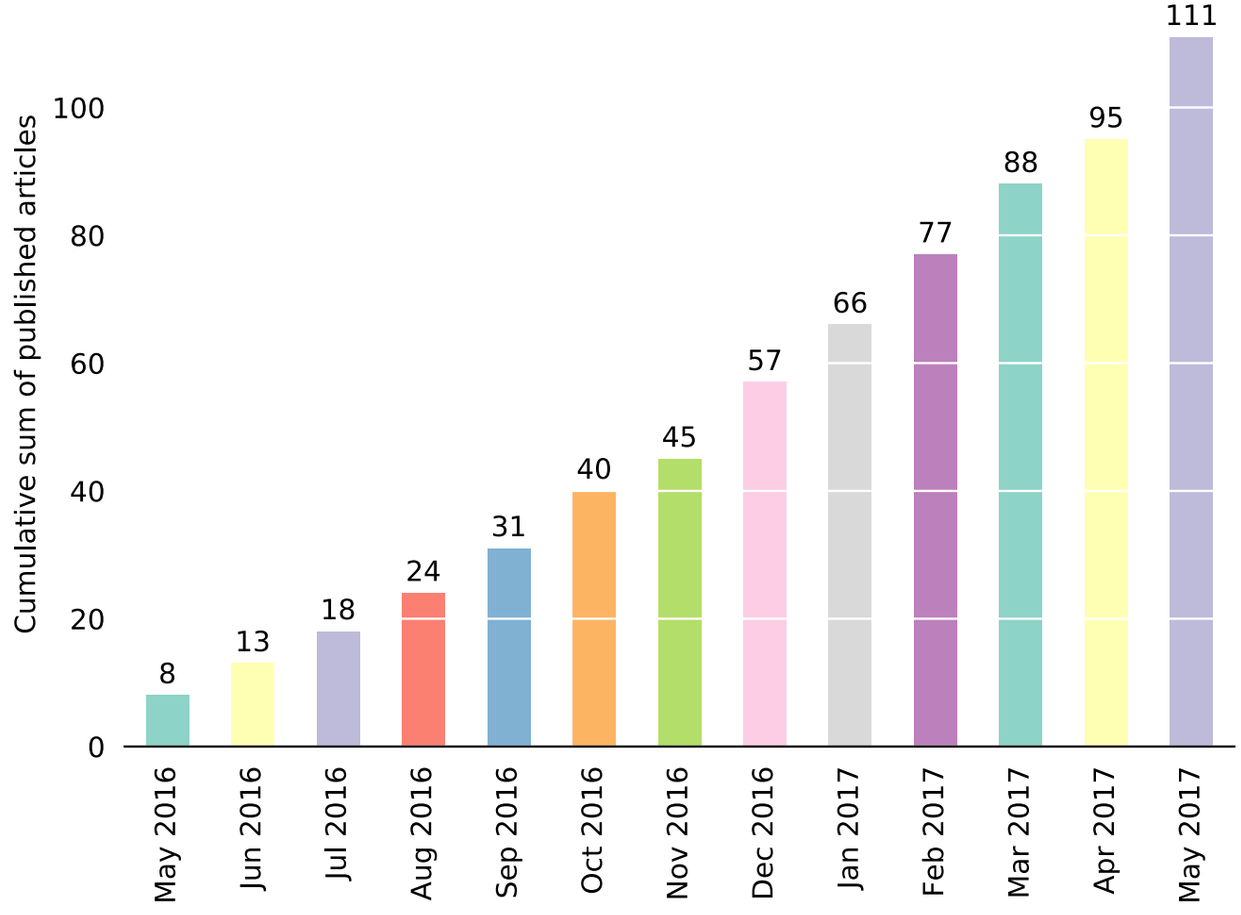
- Using welcoming and inclusive language
- Being respectful of differing viewpoints and experiences
- Gracefully accepting constructive criticism
- Focusing on what is best for the community
- Showing empathy towards other community members

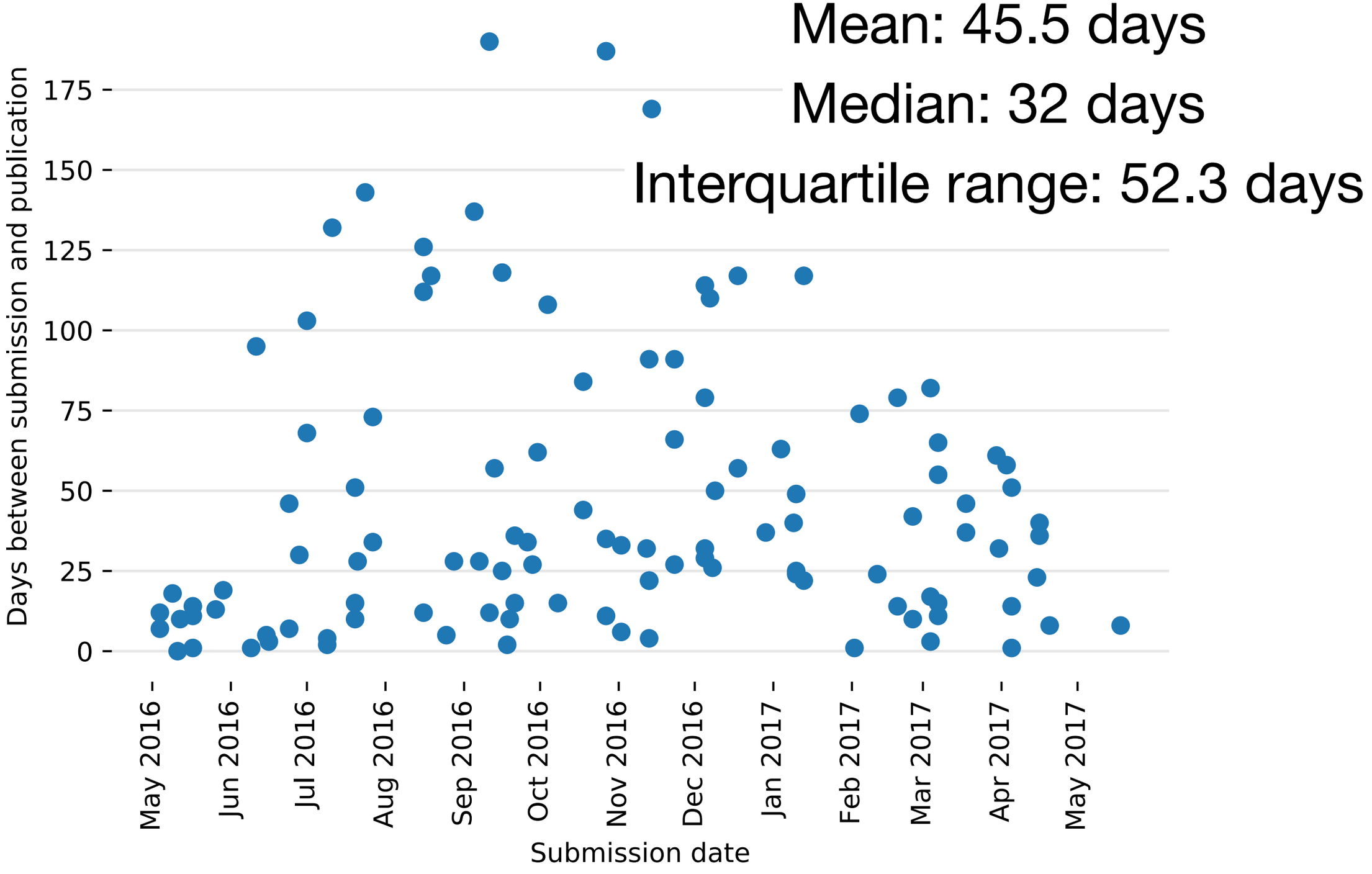
This Code of Conduct is adapted from the Contributor Covenant, version 1.4, available at http://contributor-covenant.org/version/1/4

JOSS's first year

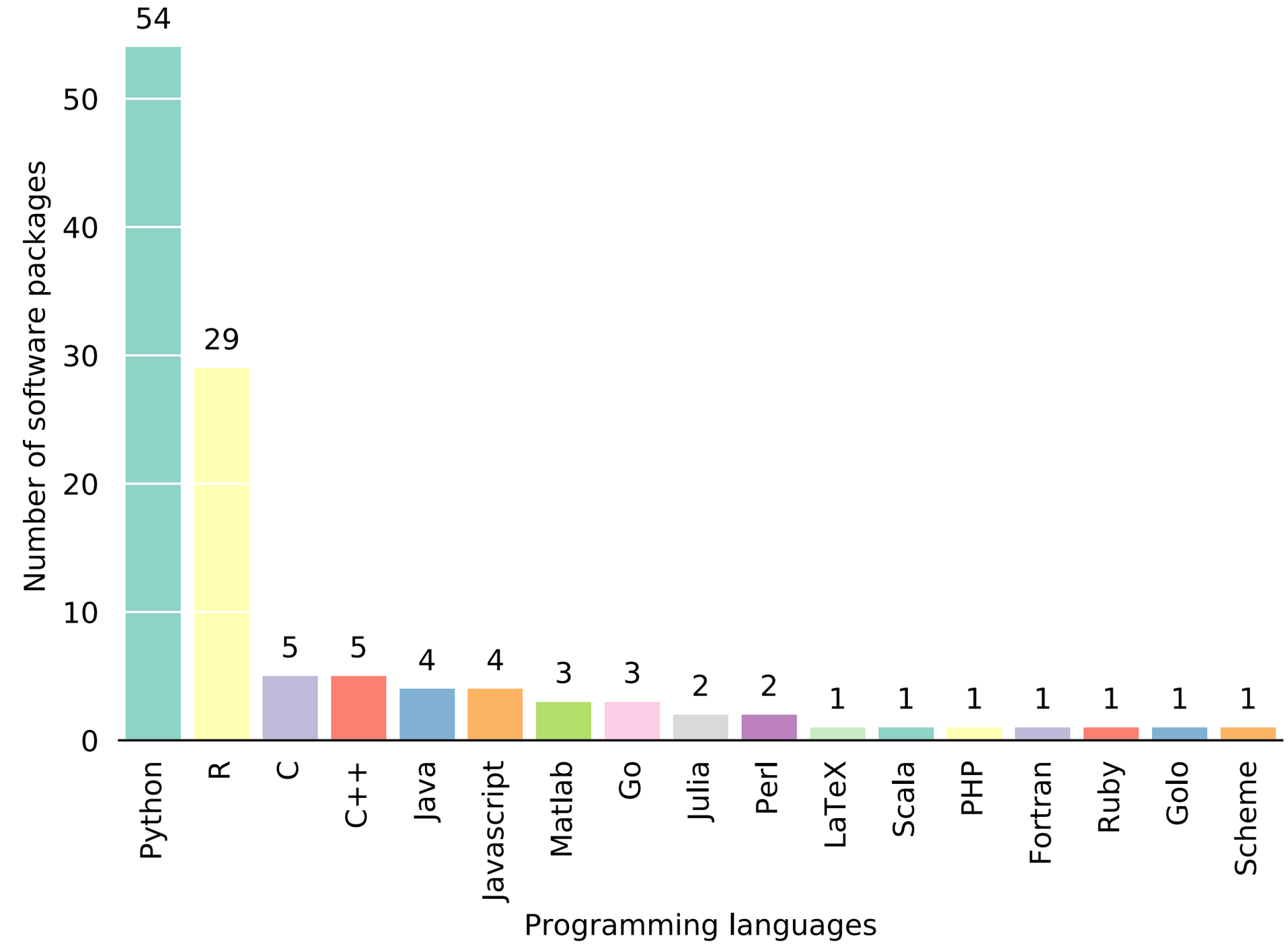
May 2016–2017: published 111 articles
(today: 122 with 57 in review)



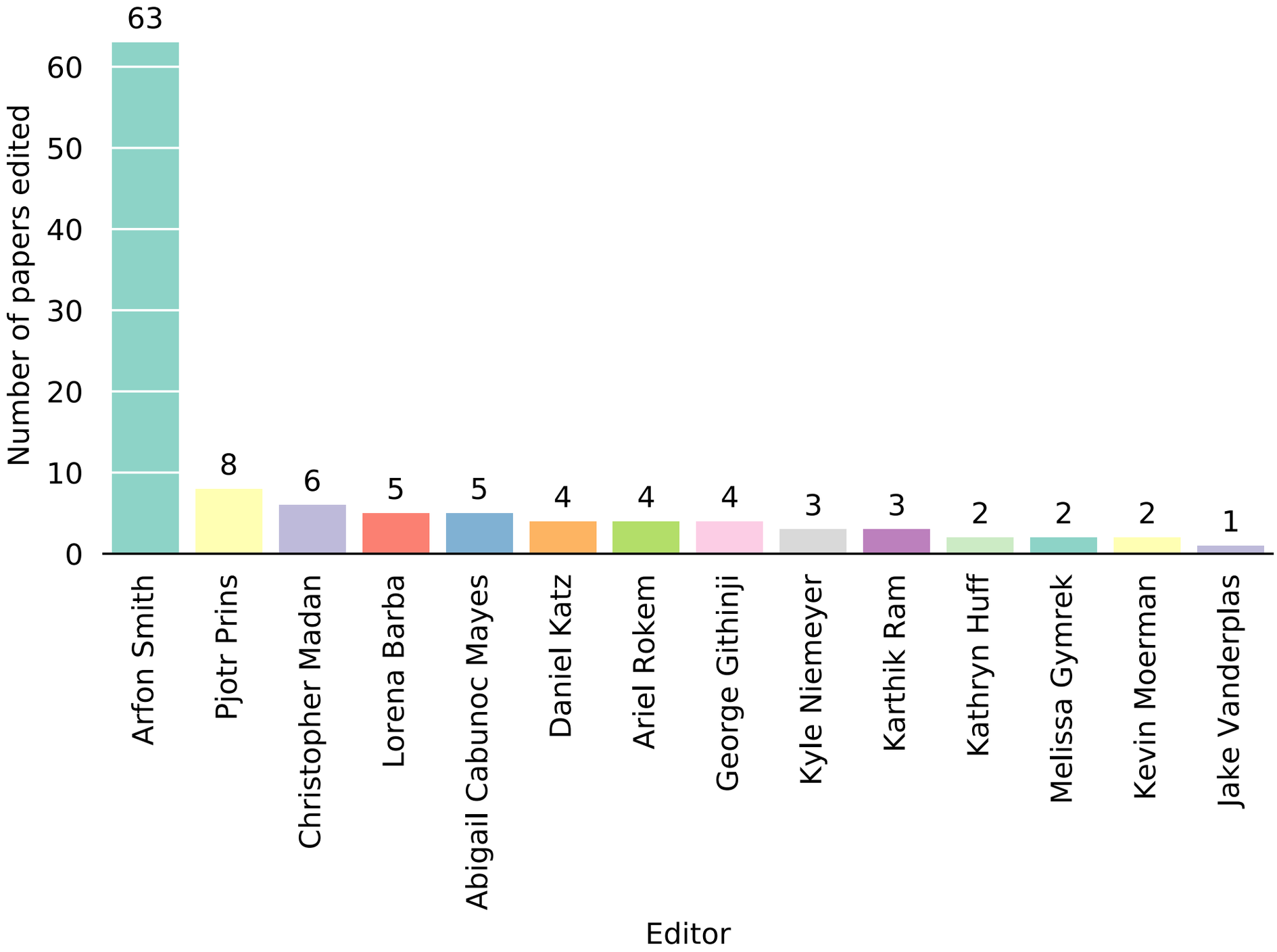




Days in review



Frequency of programming languages



Articles handled by each editor

Editor & reviewer workload

- 111 articles reviewed by 93 unique reviewers
- Average article: 1.11±0.34 reviews, max of 3
- Requests for reviewers: we reached out to 1.85±1.40 potential reviewers on average; at worst, 8
- Reviewer list[1]: 53 (now); clearly getting outside reviewers

[1] https://github.com/openjournals/joss/blob/master/docs/reviewers.csv

Become a reviewer!

Create an “I'd like to review for JOSS” issue at
https://github.com/openjournals/joss

OR

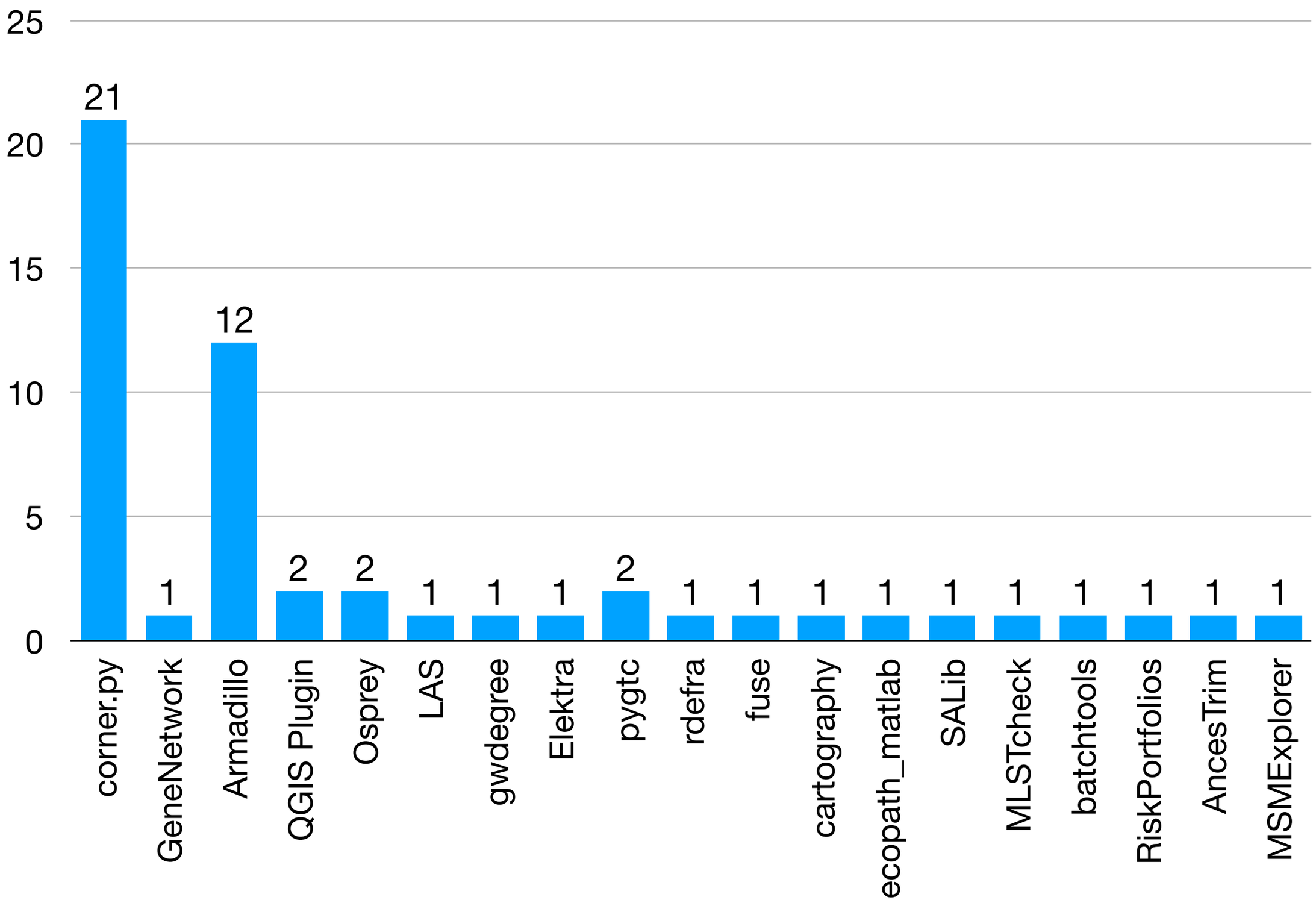
Add yourself to CSV file at
https://github.com/openjournals/joss/blob/master/docs/reviewers.csv

Citations

JOSS is not (yet) indexed by Google Scholar ☹️

(we’re working on it)

Citations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corner.py
GeneNetwork
Armadillo
QGIS Plugin
Osprey
LAS
gwdegree
Elektra
pygtc
rdefra
fuse
cartography
ecopath_matlab
SALib
MLSTcheck
batchtools
RiskPortfolios
AncesTrim
MSMExplorer

Citations

corner. py: Scatterplot matrices in Python

D Foreman-Mackey - The **Journal** of **Open Source Software**, 2016 - adsabs.harvard.edu

Abstract This Python module uses matplotlib (Hunter 2007) to visualize multidimensional samples using a scatterplot matrix. In these visualizations, each one-and two-dimensional projection of the sample is plotted to reveal covariances. corner was originally conceived to

Cited by 66 Related articles Cite Save More

[PDF] Armadillo: a template-based C++ library for linear algebra

C Sanderson, R Curtin - **Journal** of **Open Source Software**, 2016 - espace.library.uq.edu.au

Abstract The C++ language is often used for implementing functionality that is performance and/or resource sensitive. While the standard C++ library provides many useful algorithms (such as sorting), in its current form it does not provide direct handling of linear algebra

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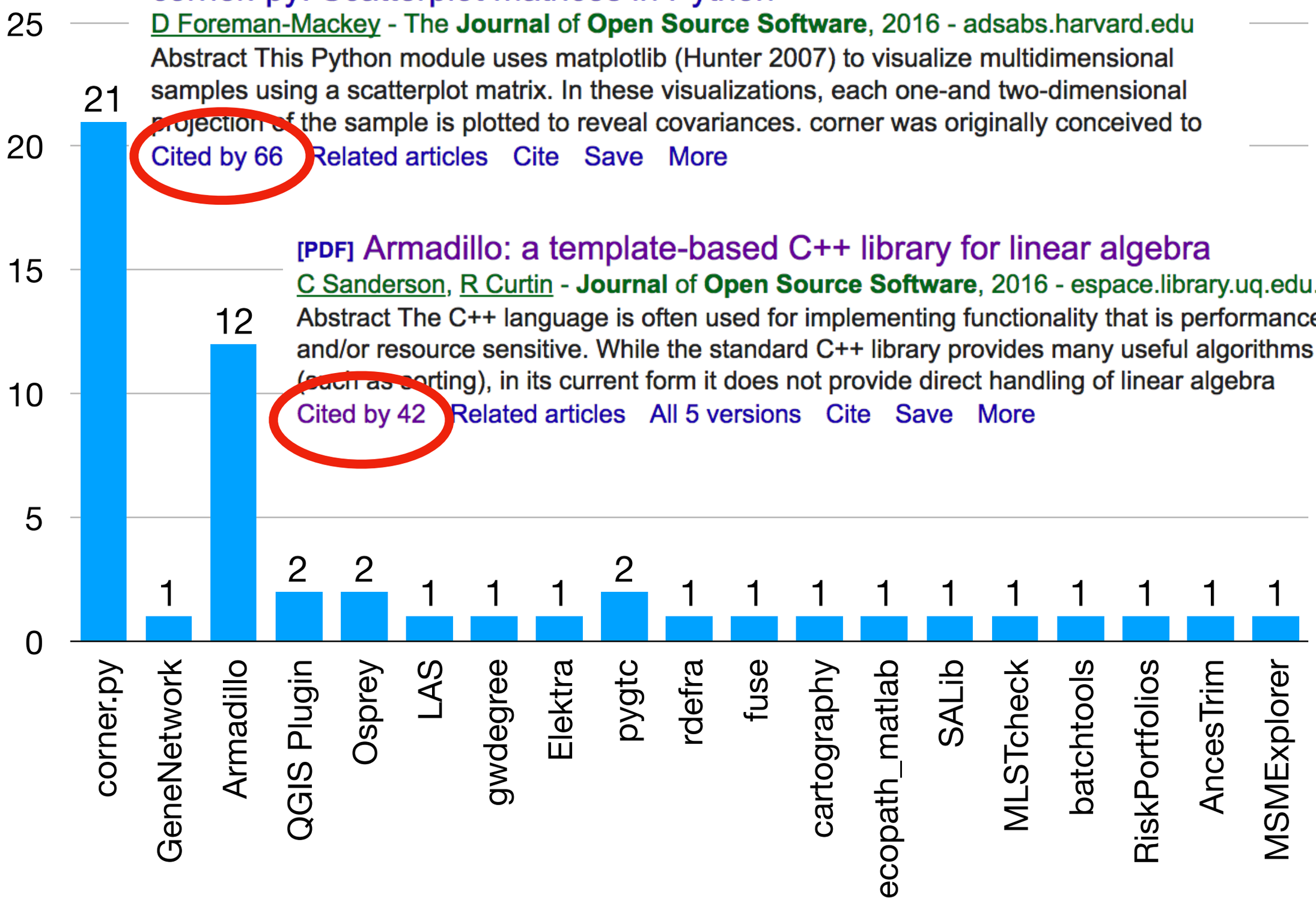

Conclusions

- JOSS provides a mechanism to get your software peer-reviewed and published—and eventually cited—with little additional work*

- Work still needed on getting citations indexed and (further) raising awareness of citing software

- Submit your software!

Thank you! Questions?

*Assuming you've followed good software development practices…

SciPy: Submit your software!

http://joss.theoj.org/papers/new

goo.gl/W5VfLm