Closing The Gaps In The Software Citation Workflow. One `@software{...}` Citekey At A Time.

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Me: kind of a "software librarian" at TIB(.eu)

- German National Library of Science and Technology, Hannover
- working on R&D around scientific software projects, FAIR data principles, etc.
- Disclaimer: Here just as an interested user, not on behalf of any org or project.
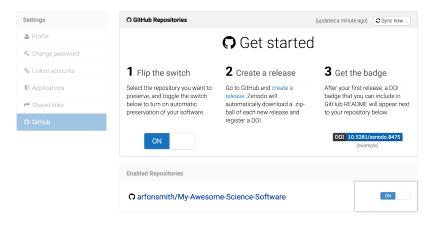
State of the... Citation.

- academics credit each other's work by citing & referencing
  - *D*igital *O*bject *I*dentifiers (doi: 10.something/something)
  - mostly journal articles, books, etc.
  - even data, because of reproducibility crisis, funders, etc.
- programs, scripts, software (packges, source code), etc. not (yet) equally publishable and citable
- community infrastructure exists (CTAN, CRAN, Debian Science, SoftwareHeritage.org, etc.)
  - #tuwat: support these projects
- this talk: for others, outside these academia

Solution examples (#tuwat at the source)

Mint DOIs for Git release tags via GitHub repo to Zenodo(.org)

guides.github.com/activities/citable-code

CITATION files (Hornik, Murdoch, and Zeileis 2012; Wilson 2013)

- express your citation wish (in BibTeX)
- @software{...} support is growing (BibLaTeX, biber, Zotero, etc.)
- like LICENSE, COPYING, INSTALL & Co.

```
@book{wickham_ggplot2_2009,
    author = {Hadley Wickham},
    title = {ggplot2: elegant graphics for data analysis},
    publisher = {Springer New York},
    year = {2009},
    isbn = {978-0-387-98140-6},
    url = {http://had.co.nz/ggplot2/book},
}
```

`codemeta.json`[1] to cover user / researcher / machine stories:

- extract "citation metadata to give credit"
- find "versions & dependencies for exact replication"
- "discover useful software through keywords"

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[1]codemeta.github.io

codemeta.json example of codemetaR[2] generator

```
{"@context": ["http://purl.org/codemeta/2.0", "http://scher
  "@id": "https://doi.org10.5281/zenodo.1048320",
  "@type": "SoftwareSourceCode",
  "identifier": "codemetar",
  "description": "The 'Codemeta' Project defines a 'JSON-LI
  "issueTracker": "https://github.com/ropensci/codemetar/is
  "license": "https://spdx.org/licenses/MIT",
  "version": "0.1.2",
  "programmingLanguage": {
    "@type": "ComputerLanguage",
    "name": "R",
    "version": "3.4.2",
    "url": "https://r-project.org"}, ...}
```

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[2]ROpenSci.GitHub.io/codemetar (Boettiger et al. 2017)

#tuwat: define `CITATION` or `codemeta.json` files for your projects as 1st step in the software citation workflow

#tuwat++ (further downstream)

- build codemetaR-like packages / plug-ins for other languages, IDEs, etc.
- contribute github.com/zotero/translators (.js to extract bibliographic info)
  - also for `CITATION` files or `codemeta.json`
  - or for media.ccc.de ;-)

Thanks for your attention! Questions, comments, hints? To twitter.com/@gittaca or katrin.leinweber@tib.eu, please! Thanks :-)

Further reading / watching

- Smith AM, Katz DS, Niemeyer KE, FORCE11 Software Citation Working Group. (2016) Software citation principles. PeerJ Computer Science 2:e86 doi.org/10.7717/peerj-cs.86
- github.com/FORCE11/FORCE11-sciwg (Software Citation Implementation Working Group of the Future of Research Communication and E-Scholarship)
- Roberto Di Cosmo, Stefano Zacchiroli. Software Heritage: Why and How to Preserve Software Source Code. iPRES 2017: 14th International Conference on Digital Preservation, Sep 2017, Kyoto, Japan. ipres2017.jp. hal-01590958
- WikiData Katherine Thornton & Finn Årup Nielsen: Describing Software So We Can Cite Software. media.ccc.de/v/wikidatacon2017-10013

Bibliography

Boettiger, Carl, Maëlle Salmon, Noam Ross, Arfon Smith, and Anna Krystalli. 2017. "Ropensci/Codemetar: Codemetar: Generate CodeMeta Metadata for R Packages." doi:10.5281/zenodo.1048320.

Hornik, Kurt, Duncan Murdoch, and Achim Zeileis. 2012. "Who Did What? The Roles of R Package Authors and How to Refer to Them." *The R Journal* 4 (1): 64–69. https://journal.r-project.org/archive/2012/RJ-2012-009/index.html.

Wilson, Robin. 2013. "Encouraging Citation of Software Introducing CITATION Files." http://blog.rtwilson.com/encouraging-citation-of-software-introducing-citation-files/.