

Building and Maintaining R Packages

Christopher T. Kenny

2025-10-01

Princeton R Group



DATA-DRIVEN
SOCIAL SCIENCE
PRINCETON UNIVERSITY

Who am I?



Christopher T. Kenny
christopherkenny

Postdoc @ Princeton DDSS. Redistricting
and rstats. Harvard Government PhD '25.
Cornell '19.



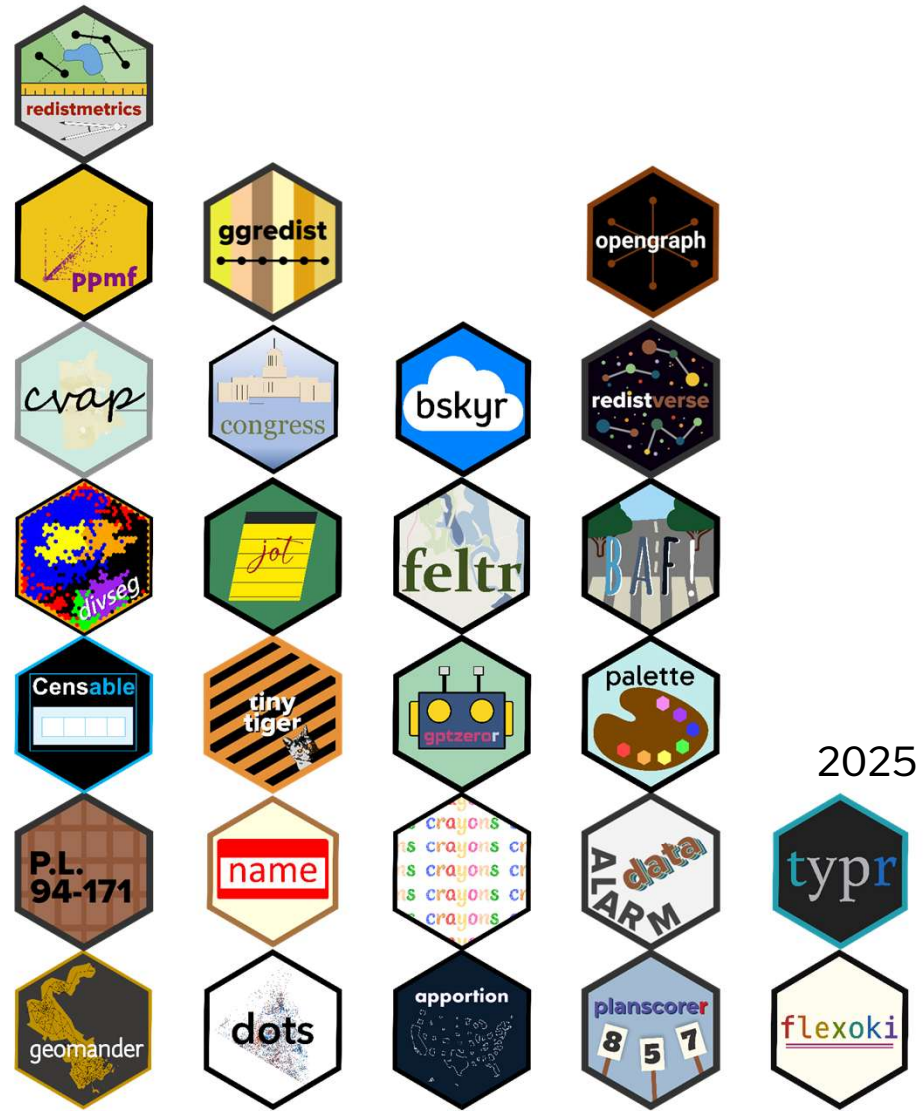
Packages Timeline

2015

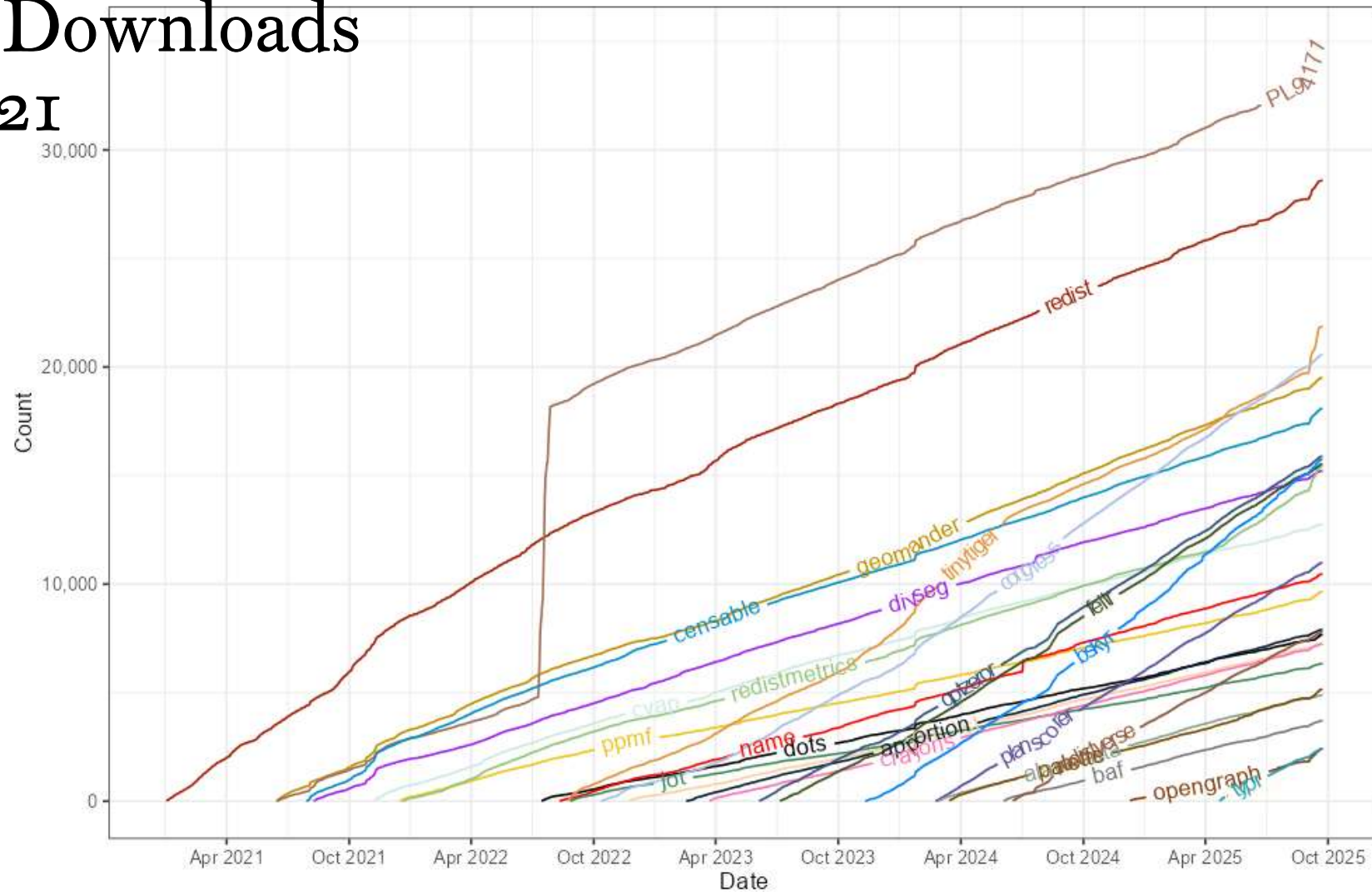


2020

Chris
joins
redis



Package Downloads Since 2021



Today

- Backstory
 - Deciding if and when to make a package
 - Stable-stage packages
 - CRAN submissions
 - Maintenance
 - Ongoing package work
-

how_it_began()

Think back to simpler times



Princeton
University
circa 2013

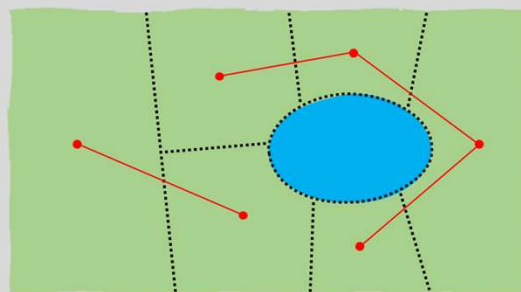
Photo from Princeton University Library

How I imagine it

Ben Fifield
Princeton Politics
PhD 2019



Did you
th
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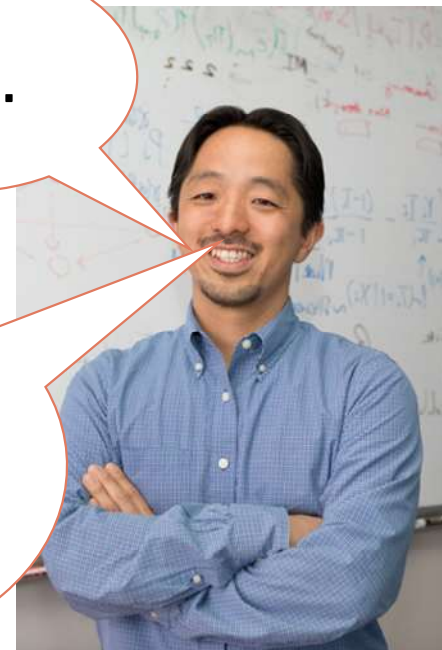


redist

It uses
methods.

ly no
more.
I'm in.

Kosuke Imai
Princeton Politics/
CSML 2003-2018



No.

Research-driven development

JOURNAL OF COMPUTATIONAL AND GRAPHICAL STATISTICS
2020, VOL. 29, NO. 4, 715–728
<https://doi.org/10.1080/10618600.2020.1739532>

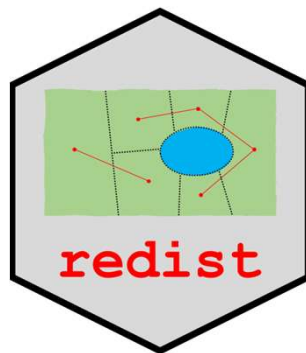


Check for updates

Automated Redistricting Simulation Using Markov Chain Monte Carlo

Benjamin Fifield^a, Michael Higgins^b, Kosuke Imai^{a,c,d}, and Alexander Tarr^e

^aInstitute for Quantitative Social Science, Harvard University, Cambridge, MA; ^bDepartment of Statistics, Kansas State University, Manhattan, KS; ^cDepartment of Government, Harvard University, Cambridge, MA; ^dDepartment of Statistics, Harvard University, Cambridge, MA; ^eDepartment of Electrical Engineering, Princeton University, Princeton, NJ



STATISTICS AND PUBLIC POLICY
2020, VOL. 7, NO. 1, 52–68
<https://doi.org/10.1080/2330443X.2020.1791773>



OPEN ACCESS

Check for updates

The Essential Role of Empirical Validation in Legislative Redistricting Simulation

Benjamin Fifield^a, Kosuke Imai^{a,b,c}, Jun Kawahara^d, and Christopher T. Kenny^b

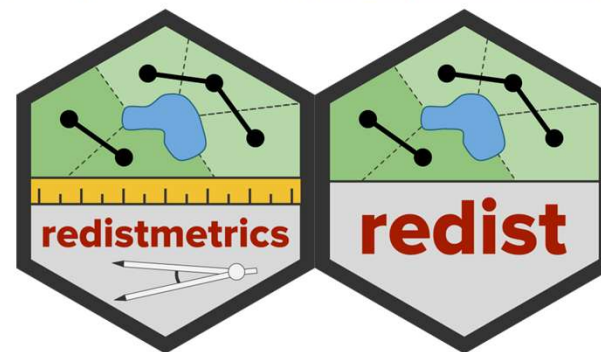
^aInstitute for Quantitative Social Science, Harvard University, Cambridge, MA; ^bDepartment of Government, Harvard University, Cambridge, MA; ^cDepartment of Statistics, Harvard University, Cambridge, MA; ^dGraduate School of Informatics, Kyoto University, Kyoto, Japan

The Annals of Applied Statistics
2023, Vol. 17, No. 4, 3300–3323
<https://doi.org/10.1214/23-AOAS1763>
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SEQUENTIAL MONTE CARLO FOR SAMPLING BALANCED AND COMPACT REDISTRICTING PLANS

BY CORY MCCARTAN^a AND KOSUKE IMAI^b

Department of Statistics, Harvard University, ^acmccartan@g.harvard.edu, ^bimai@harvard.edu



Public Goods-driven development

2020 Census Redistricting Data (P.L. 94-171) Summary Files

The 2020 Census Redistricting Data (P.L. 94-171) Summary Files in the Legacy Format were posted for FTP download, by state, on August 12, 2021 and released on data.census.gov with the full redistricting toolkit on September 16, 2021. Both releases contained the same data, only the format was different.



[stat.AP] 29 May 2021

THE IMPACT OF THE U.S. CENSUS DISCLOSURE AVOIDANCE SYSTEM ON REDISTRICTING AND VOTING RIGHTS ANALYSIS

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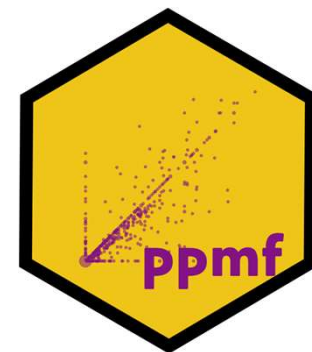
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More research-driven development



Data Descriptor | [Open access](#) | Published: 11 November 2022

Simulated redistricting plans for the analysis and evaluation of redistricting in the United States

[Cory McCartan](#), [Christopher T. Kenny](#), [Tyler Simko](#), [George Garcia III](#), [Kevin Wang](#), [Melissa Wu](#), [Shiro Kuriwaki](#) & [Kosuke Imai](#) 

[Scientific Data](#) **9**, Article number: 689 (2022) | [Cite this article](#)

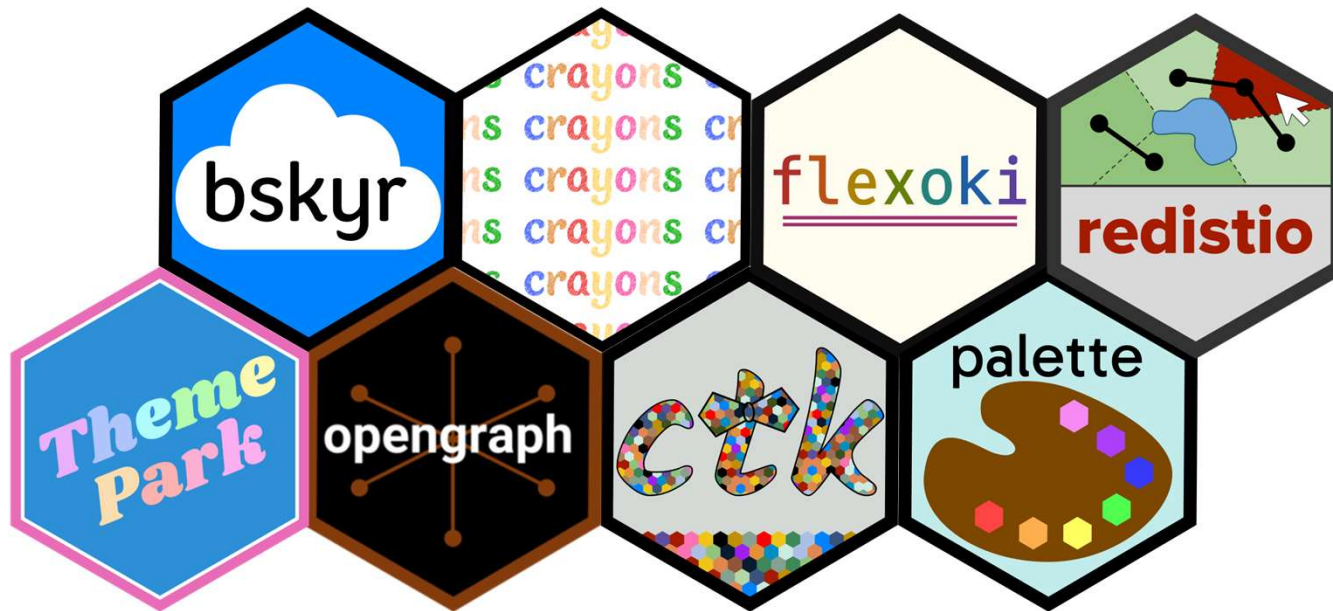
7655 Accesses | **23** Citations | **8** Altmetric | [Metrics](#)



Fun-driven development

After the first dozen packages or so, it becomes fun.

- Me, when asked what's wrong with me

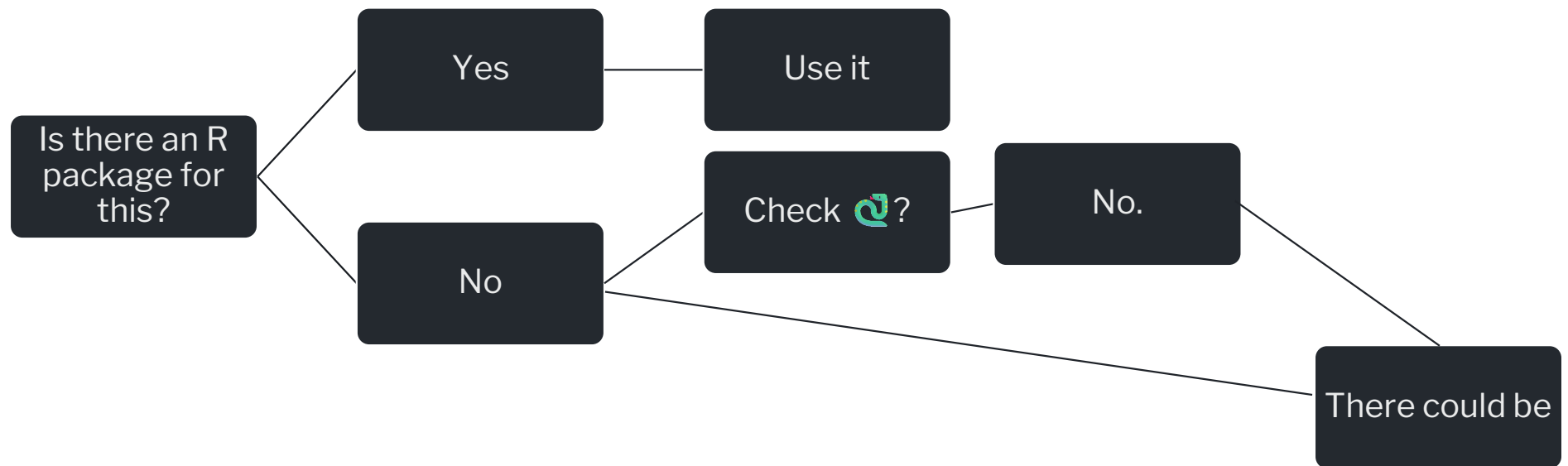


is_package()

What makes a package?

- A package is a family of functions where:
 3. they're applicable to at least 3 projects or use cases
 - Someone is willing to:
 3. organize the code into a package structure
-

Building a developer mindset

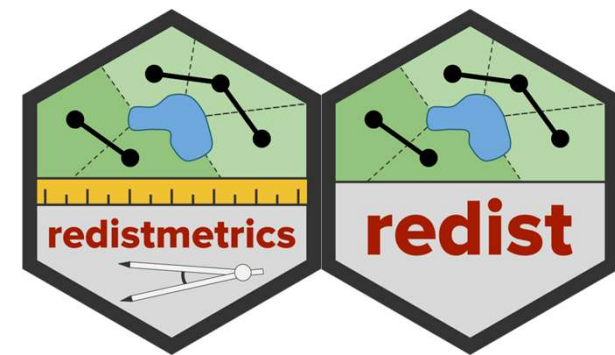


Defining package scope

- Functions are connected and useful to others
 - What tasks do you see others doing?
 - How is your code related to itself?
 - Don't throw everything into one package
 - Package bloat is a real problem
 - Are these features that should be added to an existing package?
-

Scope example: redist and redistmetrics

- redist: Simulation Methods for Legislative Redistricting
- redistmetrics: Redistricting Metrics
- redist **Depends** on redistmetrics
 - redistmetrics was *part* of redist until 2022
- CRAN has compile time limits: 10 min.
- The C++ for redist + redistmetrics ~ 12 min.



Deciding on dependencies

- Imports: Pkg A loads functions from Pkg B
 - Depends: Pkg A attaches Pkg B
 - Suggests: Pkg A can maybe do more when Pkg B is around
 - LinkingTo: Pkg A uses C/C++ from Pkg B
 - Enhances: Pkg A makes that Pkg B better
-

Deciding on dependencies

- D
 - W
 - C
 - D
 - Is
- Does adding this dependency improve:
- My package's ability to fulfill its scope
 - My users' ability to use this package
-

Dependencies example: Census TIGER/Lines Shapefiles



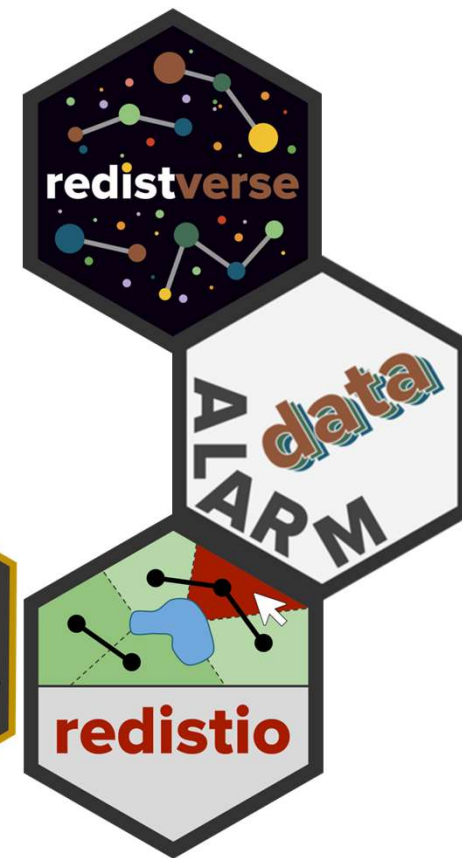
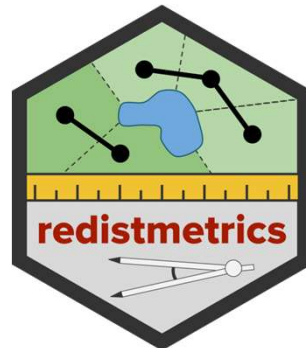
tinytiger

- Direct dependencies
 - cli, curl, glue, sf
- All dependencies
 - DBI, Rcpp, classInt, cli, curl, e1071, glue, magrittr, proxy, s2, sf, units, wk, class, KernSmooth, MASS



tigris

- Direct dependencies
 - dplyr, httr, magrittr, rappdirs, sf, stringr, uuid
- All dependencies
 - DBI, R6, Rcpp, askpass, classInt, cli, curl, dplyr, e1071, generics, glue, httr, jsonlite, lifecycle, magrittr, mime, openssl, pillar, pkgconfig, proxy, rappdirs, rlang, s2, sf, stringi, stringr, sys, tibble, tidyselect, units, utf8, uuid, vctrs, withr, wk, class, KernSmooth, MASS



is_stable()

Would I trust this code to work for other people?

lifecycle	stable
-----------	--------

lifecycle	mostly stable
-----------	---------------

lifecycle	experimental
-----------	--------------

lifecycle	no promises
-----------	-------------

Update the GitHub README

Package	Description	Lifecycle
redistio	An interactive redistricting app run locally in Shiny	lifecycle stable
ei	Run ecological inference models in R. This is a project with Shusei Eshima and Gary King to update Gary King and Molly Robert's original ei package from a decade ago.	lifecycle mostly stable
vf	Read in publicly available voter files in R.	lifecycle no promises
manifesto	Create R project manifest files, designed for less restrictive coding environments (e.g., teaching, workshops)	lifecycle stable
ha	Control your smart home from R using the Home Assistant API	lifecycle experimental
ggtiger	ggplot2 extensions for Princeton's brand guidelines	lifecycle stable

Create a pkgdown site

`usethis::use_pkgdown_github_pages()`

```
url: http://christophertkenny.com/ggtiger/
```

```
template:
```

```
  bootstrap: 5
```

```
  bslib:
```

```
    primary: "#e98338"
```

```
    base_font: {
```

```
      google: "Libre Franklin"
```

```
    }
```

ggtiger 0.0.0.9000 Reference

ggtiger

`ggtiger` offers a setup for `ggplot2` that follows the Princeton University brand guidelines, where possible. As some fonts must be sourced from the [Office of Communications](#), this will search for them locally first. If none are available, it uses secondary fonts from the brand guidelines and downloads them from Google Fonts if necessary. It contains several color palettes, as designed for “infographics” by the Office of Communications.

Installation

You can install the development version of `ggtiger` from [GitHub](#) with:

```
# install.packages("pak")
pak::pak("christophertkenny/ggtiger")
```

License

[Full license](#)

[MIT](#) + file [LICENSE](#)

Citation

[Citing ggtiger](#)

Developers

Christopher T. Kenny

Author, maintainer 

Dev status

 R-CMD-check.yaml passing

Hex logo

```
usethis::use_logo()
```



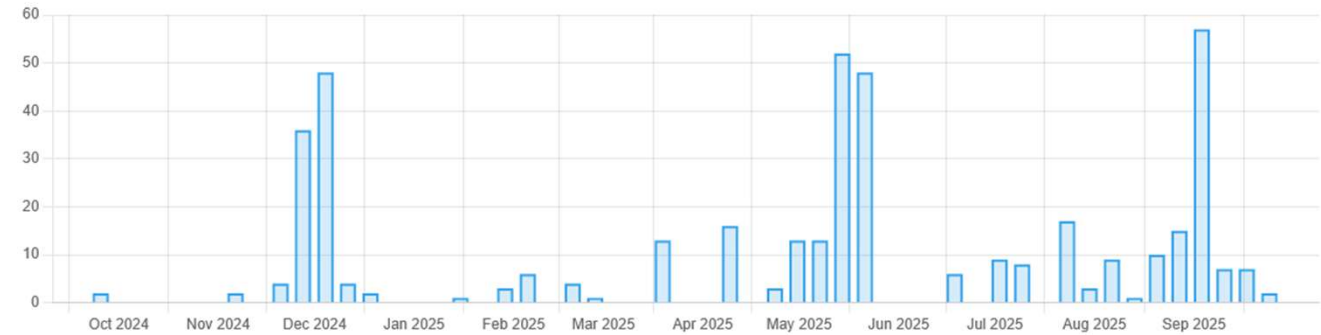
Add to r-universe



Christopher T. Kenny

Postdoc @ Princeton DDSS.
Redistricting and rstats. Harvard
Government PhD '25. Cornell '19.

- [r-universe/christopherkenny](#) ✓
- Princeton University
- Princeton, NJ
- <https://www.christophertkenny.c...>
- christopherkenny@fas.harvard.edu
- 37 packages
- 20 articles
- 54 datasets
- 32 contributors
- 105 followers



Commit	Package	Version	Maintainer	Src	R-dev	R-release	R-old	Built
2025-09-24	bskyr	0.4.0	Christopher T. Kenny					1 hours ago
2025-09-23	alarm-redist/redis	4.3.0	Christopher T. Kenny					23 hours ago
2025-09-21	manifesto	0.0.1	Christopher T. Kenny					4 days ago
2025-09-12	palette	0.0.3	Christopher T. Kenny					12 days ago
2025-09-12	cvap	0.1.6	Christopher T. Kenny					12 days ago
2025-09-12	dots	0.0.3	Christopher T. Kenny					12 days ago
2025-09-05	gptzeror	0.0.2	Christopher T. Kenny					19 days ago
2025-09-05	corymccartan/PL94171	1.2.0	Cory McCartan					19 days ago
2025-09-04	alarm-redist/redistmetrics	1.0.10	Christopher T. Kenny					20 days ago
2025-09-04	alarm-redist/redistmetrics	1.0.10	Christopher T. Kenny					20 days ago
2025-09-03	planscorer	0.0.3	Christopher T. Kenny					21 days ago

submit_cran()

The line between GitHub and CRAN

Writing R Extensions

This is a guide to extending R, describing the process of creating R add-on packages, writing R documentation, R's system and foreign language interfaces, and the R API.

This manual is for R, version 4.6.0 Under development (2025-09-22).



Putting a package on CRAN is a contract

22.5 Reverse dependency checks

☐ `revdepcheck::revdep_check(num_workers = 4)`


This innocuous checklist item can actually represent a considerable amount of effort. At a high-level, checking your reverse dependencies (“revdeps”) breaks down into:

- Form a list of your reverse dependencies. These are CRAN packages that list your package in their `Depends`, `Imports`, `Suggests` or `LinkingTo` fields.
- Run `R CMD check` on each one.
- Make sure you haven’t broken someone else’s package with the planned changes in your package.


Fix for upcoming stringr 1.6.0 release #46

 christopherkenny merged 1 commit into [christopherkenny:main](#) from [hadley:stringr-1.6.0](#) 1 hour ago

 Conversation 2  Commits 1  Checks 7  Files changed 1

 hadley commented 19 hours ago Contributor


`str_replace_all()` now requires functions to be vectorised (since this is way way more performant).


 304d25d

This was referenced 19 hours ago

[Fix vectorised replacement failures tidyverse/stringr#551](#) Closed

[Revdep failures tidyverse/stringr#590](#) Open

 christopherkenny merged commit `06cb61e` into [christopherkenny:main](#) 1 hour ago 7 checks passed View details Revert

 hadley commented 46 minutes ago Contributor Author

As a heads up, we're planning to submit stringr 1.6.0 to CRAN on November 3.

Snippet from Wickham and Bryan R Packages (2e) Ch. 22

Does my code pass **devtools::check()** in 3 places?

- Full control: Your laptop(s), desktop(s), or server(s)
 - `devtools::check()`
 - Configurable: GitHub Actions
 - `usethis::use_github_action('check-standard')`
 - No control: Winbuilder
 - `devtools::check_win_release()` &
`devtools::check_win_devel()`
-

maintain()

CRAN nightly builds

CRAN Package Check Results for Maintainer 'Christopher T. Kenny <ctkenny at proton.me>'

Last updated on 2025-09-24 16:49:22 CEST.

Package	ERROR	OK
apportion		13
baf		13
censable		13
congress		13
crayons		13
cvap		13
divseg		13
dots		13
flexoki		13
geomander		13
ggredist	8	5
gptzeror		13
jot		13
name		13
opengraph		13
palette		13
planscorer		13
ppmf		13
typr		13

CRAN Package Check Results for Maintainer 'Christopher T. Kenny <christopherkenny at fas.harvard.edu>'

Last updated on 2025-09-24 16:49:21 CEST.

Package	ERROR	NOTE	OK
bskyr			13
feltr		10	3
redist	1	3	9
redistmetrics		2	11
redistverse			13
tinytiger			13

Use expansive tests

- `usethis::use_testthat()`
- `usethis::use_test()`
- `covr::package_coverage()`
- `tinytest::setup_tinytest('pkgdir')`



```
----- FAILED[logo]:  
call| get_logo()  
diff| No logo found.
```

Dependencies pose risks



<https://github.com/tidyverse/lubridate/issues/998>

dieghernan opened on Oct 5, 2021 · edited by dieghernan

Edits ▾ ...

Hi, I just received a very long email from Prof. Brian Ripley (CRAN)

Dear maintainers,

This concerns the CRAN packages:

(omitted: long list of packages and maintainers)

We have asked for an update fixing the check problems shown at https://cran.r-project.org/web/checks/check_results_lubridate.html with no update from the maintainer thus far.

Thus, package lubridate is now scheduled for archival on 2021-10-19, and archiving this will necessitate also archiving its strong reverse dependencies.

Please negotiate the necessary actions.

The CRAN Team

I just want to confirm with you if the package is actively maintained (I think so) and if you plan to release a new version on CRAN.

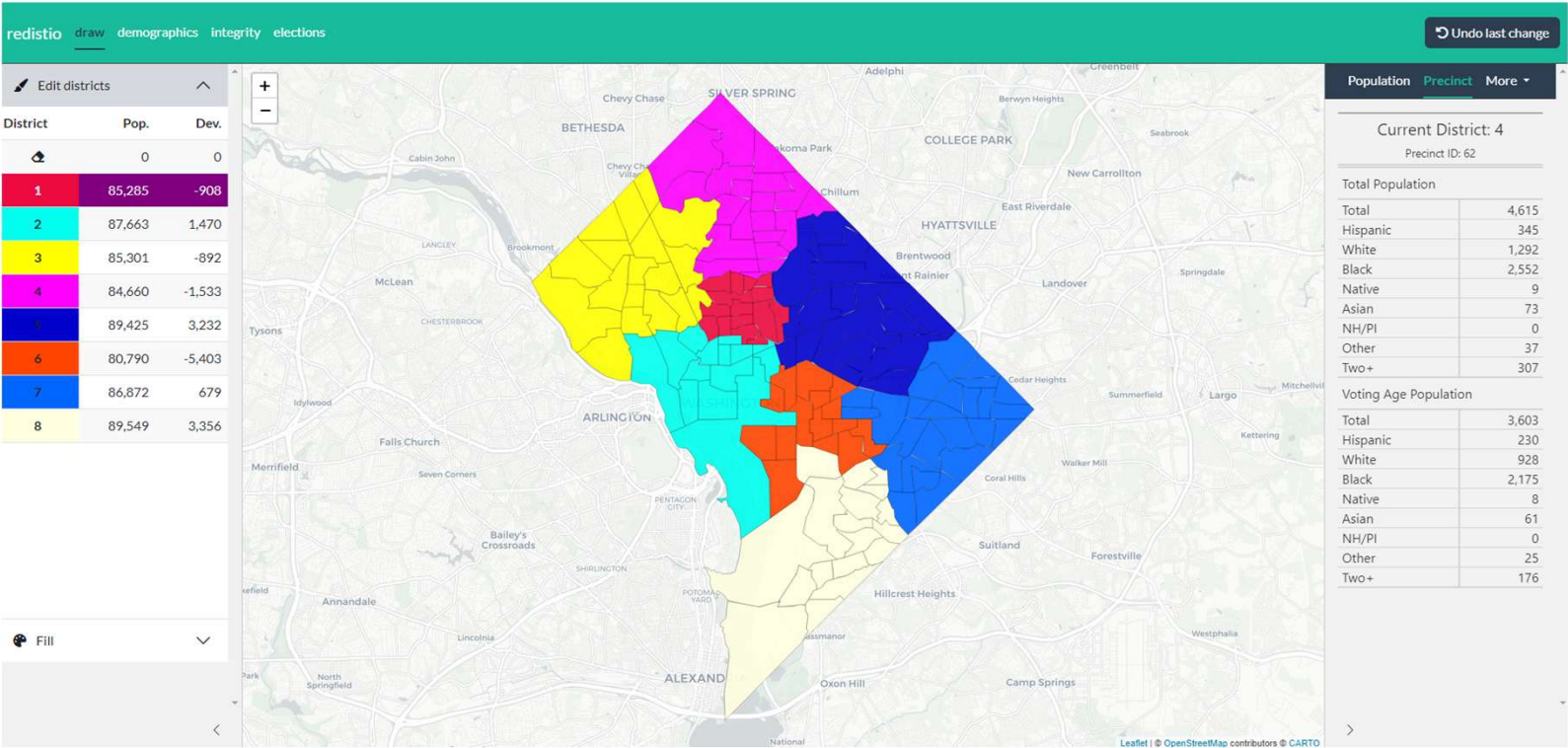
Regards



24

current_dev()

redistio



manifesto

Minimal Example

The smallest valid `rproject.toml` looks like this:

```
[project]
name = "MyAnalysis"
version = "0.0.1"

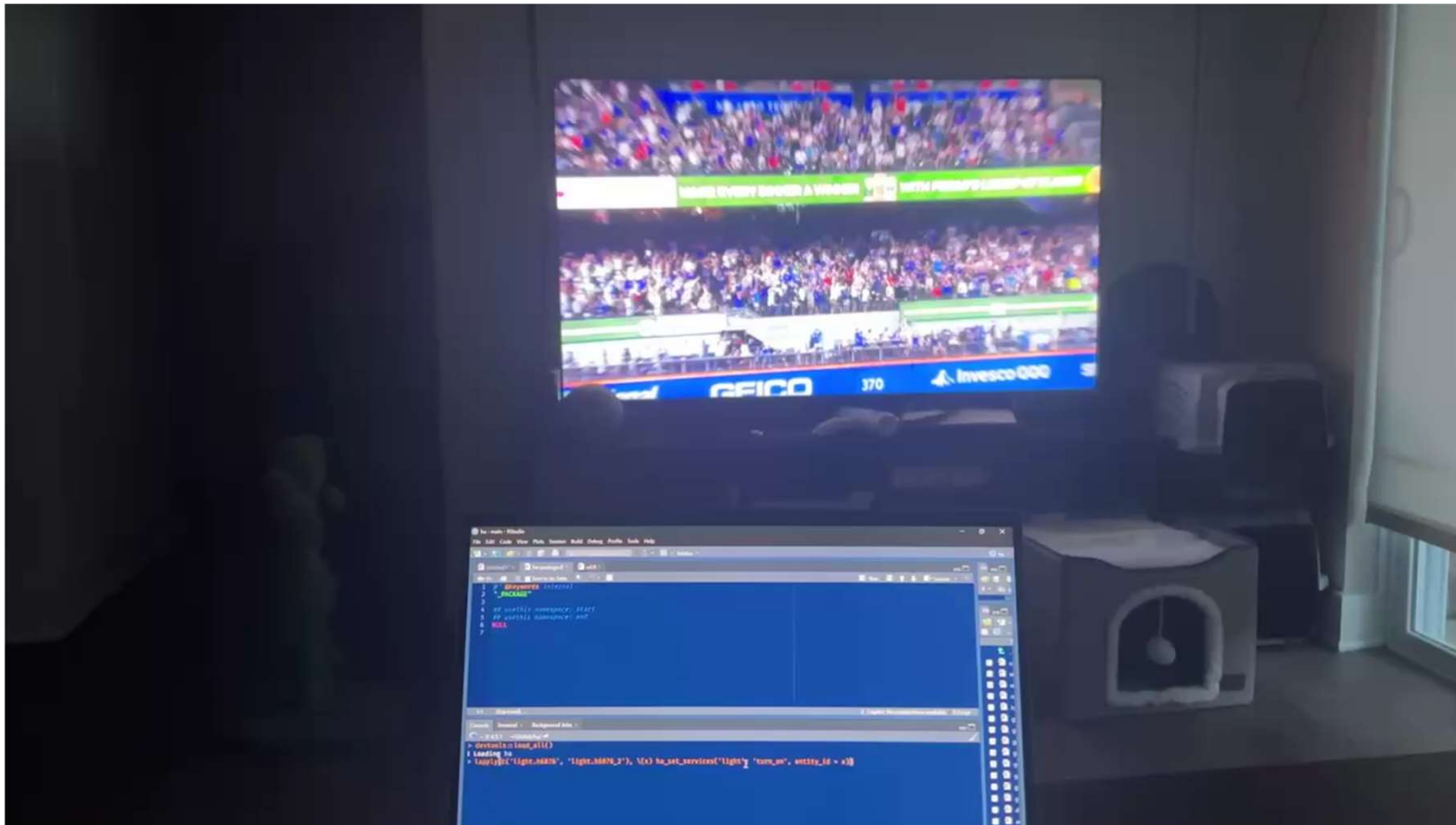
[manifesto]
version = "0.1.0"

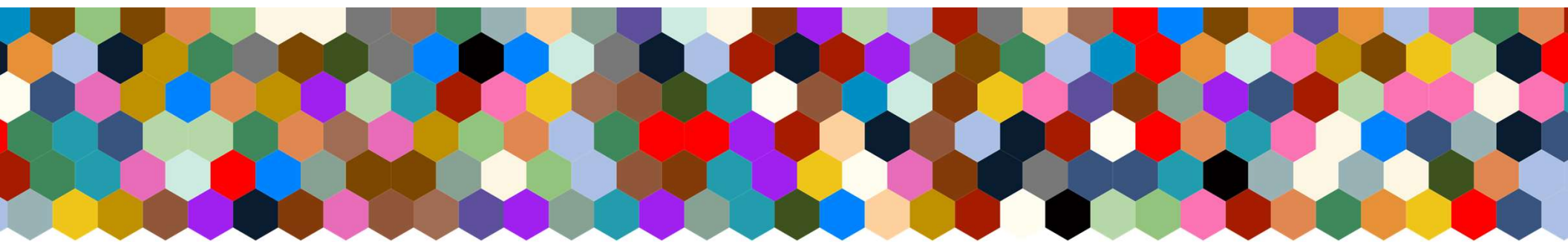
[environment]
r_version = ">= 4.4.2"

[dependencies]
dplyr = ">= 1.0.0"
```



ha





Thank you!

More info:

<https://christophertkenny.com/software>



<https://christophertkenny.com/software>