By my count, two hundred twenty-one new packages *stuck* to CRAN in March 2021.[1] Here are my "Top 40" selections in twelve categories: Computational Methods, Data, Engineering, Genomics, Machine Learning, Medicine, Music, Networks, Science, Statistics, Utility, and Visualization. Two of these categories Engineering and Music have only one entry each. However, I decided to give them their own category in order to draw attention to the use of R outside of the mainstream, and I have always lamented the fate of the *Miscellaneous*. In the same spirit, note that the complete works of *the Bard* appear in the Data category and that due to `tidypaleo` *Paleoenvironmental* is now *a thing* in R.

Computational Methods

gamlss v1.0-5: Implements computationally intensive calculations for Generalized Additive Models for location, scale, and shape as described in Rigby & Stasinopoulos (2005).

waydown v1.1.0: Implements an algorithm based on the classical Helmholtz decomposition to obtain an approximate potential function for non gradient fields. See Rodríguez-Sánchez (2020) for background and the vignette for examples.
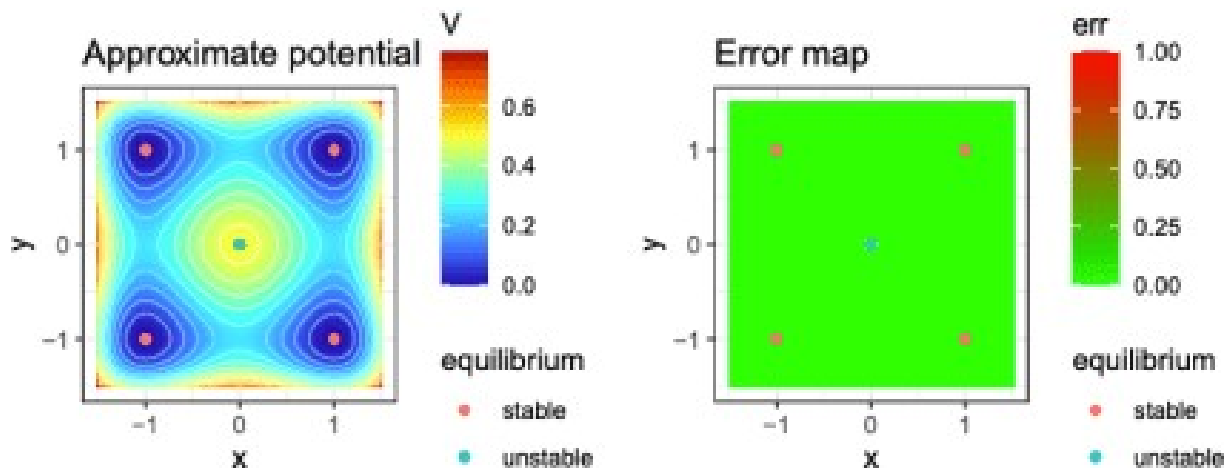
Data

aopdata v0.2.1: Provides functions to download data from the Access to Opportunities Project (AOP) which includes annual estimates of access to employment, health and education services by transport mode, as well as data on the spatial distribution of population, schools and health-care facilities at a fine spatial resolution for all cities included in the study. There is an Introduction to the package, and there are vignettes on Analyzing Inequality, Mapping Urban Accessibility, and Mapping Pooulation and Land Use.
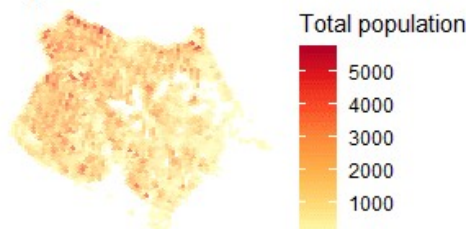

bardr v0.0.9: Provides R data structures for Shakespeare's complete works, as provided by Project Gutenberg. See README.

metro v0.9.1: Provides access to the Metro Transparent Data Sets API published by the Washington Metropolitan Area Transit Authority, the government agency operating light rail and passenger buses in the Washington D.C. area. See README.

RAQSAPI v2.0.1: Provides functions to retrieve air monitoring data and associated metadata from the US Environmental Protection Agency's Air Quality System Service. There are several short vignettes including an Introduction and a vignette on Usage tips and precautions.

troopdata v0.1.3: Provides access to U.S. Department of Defense data on overseas military deployments and includes functions for pulling country-year troop deployment and basing data. See README to get started

Locations of U.S. military facilities, 1950-2018
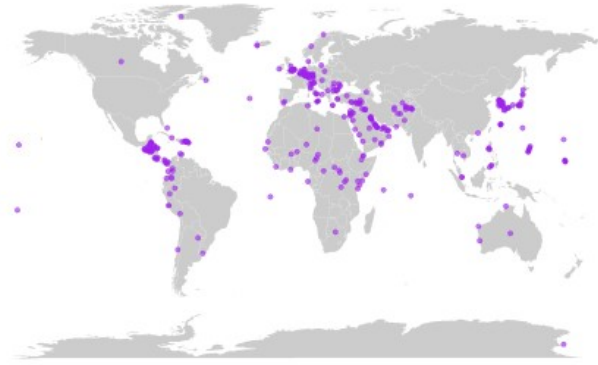
Engineering

pipenostics v0.1.7: Implements empirical and data-driven models of heat losses, corrosion diagnostics, reliability and predictive maintenance of pipeline systems which should be of interest to the engineering departments of heat generating and heat transferring companies. See Timashev et al. (2016) and Reddy (2017) for the methods used and README to get started.

### Genomics

glmmSeq v0.1.0: Provides functions to fit negative binomial mixed effects models with matched samples to model expression data. See the vignette for examples.
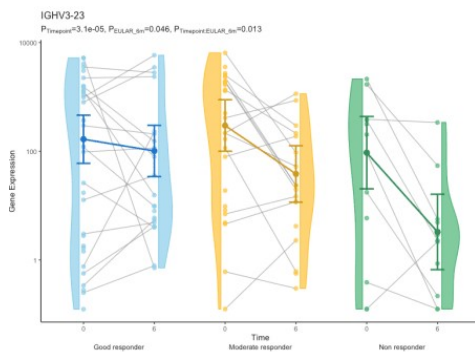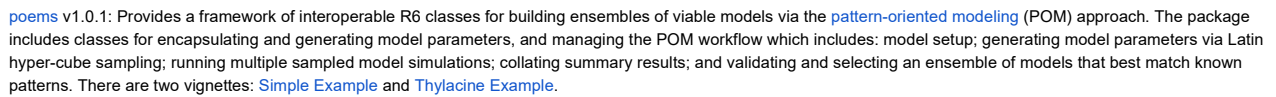

ondisc v1.0.0: Implements a method to allow researchers to analyze large-scale single-cell data as and R object stored on disk. There is a tutorial on the the ondisc matrix class and another on Metadata.

SignacX v2.2.0: Implements a neural network trained with flow-sorted gene expression data to classify cellular phenotypes in single cell RNA-sequencing data. See Chamberlain et al. (2021) for background. There are seven vignettes including an Analysis of Kidney Lupus Data and an Analysis of PBMCs from 10X Genomics.
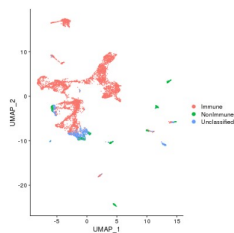
Machine Learning

opitools v1.0.3: Implements a tool to analyze opinions inherent in a text document relating to a specific subject (A) and assess how opinions expressed with respect to another subject (B) may affect the opinions on subject A. This package has been designed specifically for application to social media datasets, such as Twitter and Facebook. See Adepeju and Jimoh (2021) for an extended example that demonstrates the utility of the approach and the vignette to get started.

poems v1.0.1: Provides a framework of interoperable R6 classes for building ensembles of viable models via the pattern-oriented modeling (POM) approach. The package includes classes for encapsulating and generating model parameters, and managing the POM workflow which includes: model setup; generating model parameters via Latin hyper-cube sampling; running multiple sampled model simulations; collating summary results; and validating and selecting an ensemble of models that best match known patterns. There are two vignettes: Simple Example and Thylacine Example.

Medicine

dampack v1.0.0: Implements a suite of functions for analyzing and visualizing the health economic outputs of mathematical models. See Hunink et al. (2014) for the theoretical underpinnings. There are five vignettes including Basic Cost Effectiveness Analysis, Probabilistic Sensitivity Analysis: Analysis and Value of Information Analysis.

rdecision v1.0.3: Provides classes and functions for using decision trees to model health care interventions using cohort models. See Briggs et al. for theory and terminology. There are five vignettes including Elementary decision tree (Evans 1997) and Decision tree with PSA.

Music

gm v1.0.2: Implements a high-level language to create music including converting your music to musical scores and audio files. It works with R Markdown, R Jupyter Notebooks, and RStudio. There vignette is available in English and in Chinese.

Networks

sfnetworks v0.5.1: Provides a tidy approach to spatial network analysis in the form of classes and functions that enable a seamless interaction between the network analysis package `tidygraph` and the spatial analysis package `sf`. There are vignettes on sf network structure, Preprocessing, Spatial joins and filters, Routing, and Spatial morphers.

valhallr v0.1.0: Implements an interface to the Valhalla routing engine's API for turn-by-turn routing, isochrones, and origin-destination analyses. See the vignette for examples.


Science

asteRisk v0.99.4: Provides functions to calculate the positions of satellites given a known state vector. It includes implementations of the SGP4 and SDP4 simplified perturbation models to propagate orbital state vectors. See Hoots et al. (1988), Vallado et al. (2012), and Hoots et al. (2014) for background and the vignette for examples.


forImage v0.1.0: Implements a tool to measure the size of foraminifera and other unicellulars and includes functions to guide foraminiferal test biovolume calculations and cell biomass estimations. The volume function includes several microalgae models geometric adaptations based on Hillebrand et al. (1999), Sun & Liu (2003), and Vadrucci et al. (2007). See the vignette to get started.
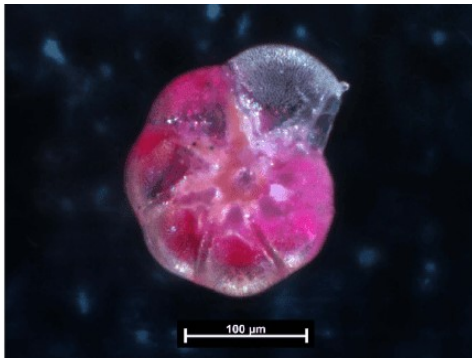
OpenSpecy v0.9.1: Provides functions to analyze, process, identify and share Raman and (FT)IR spectra with functions to implement Savitzky-Golay smoothing in accordance with Zhao et al. (2007) and identify spectra using an onboard reference library, see Cowger et al. 2020. Analyzed spectra can be shared via Shiny App. There is a vignette.
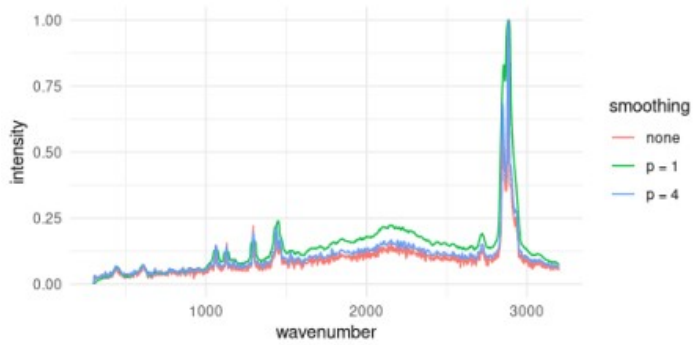
tidypaleo v0.1.1: Provides functions with a common framework for age-depth model management, stratigraphic visualization, and common statistical transformations with a focus on stratigraphic visualization using `ggplot2`. There are vignettes on Age-depth Models, Nested Analyses, and Stratigraphic Diagrams.
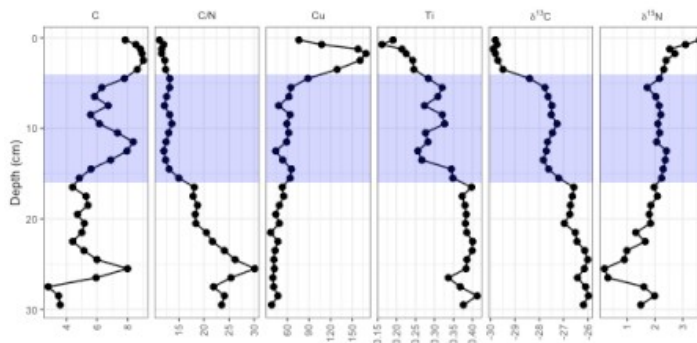

VulnToolkit v1.1.2: Provides functions to analyze and summarize tidal data sets and to access to NOAA mean sea level data. See Hill & Anisfeld (2015) for background and the vignette for examples.
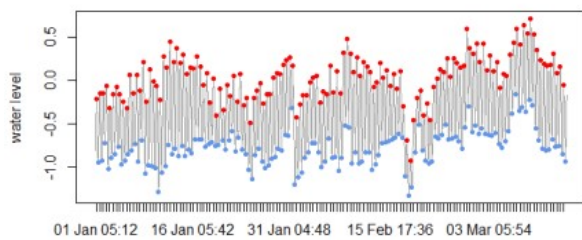

Statistics

corncob v0.2.0: Implements functions for modeling correlated count data using the beta-binomial distribution, described in Martin et al. (2020). See the vignette for an introduction.
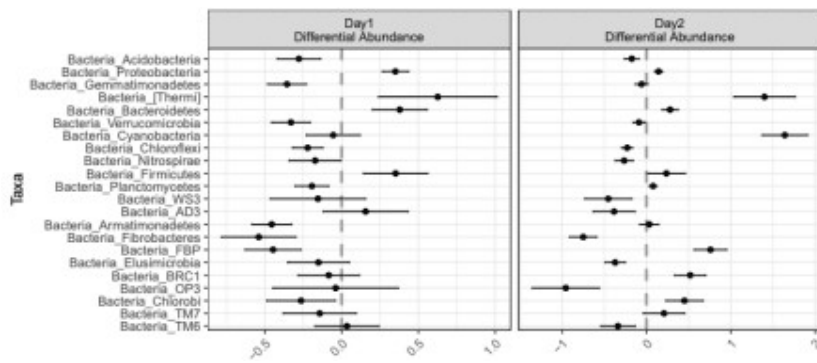
hawkesbow v1.0.2: Implements an estimation method for Hawkes processes when count data are only observed in discrete time, using a spectral approach derived from the Bartlett spectrum. See Cheysson and Lang (2020) for background and the vignette for examples.

LMMELSM v0.1.0: Implements two-level mixed effects location scale models on multiple observed or latent outcomes, and between-group variance modeling. See Williams et al. (2020) and Hedeker et al. (2008) for background and README for an example.

mixpoissinreg v1.0.0: Provides functions to fit mixed Poisson regression models (Poisson-Inverse Gaussian or Negative-Binomial) with count data response variables. See Barreto-Souza and Simas (2016) for background. There are five vignettes on Global and Local Influence, Confidence and Prediction Intervals, MLE, Tidy Methods, and Overdispersed Count Data.
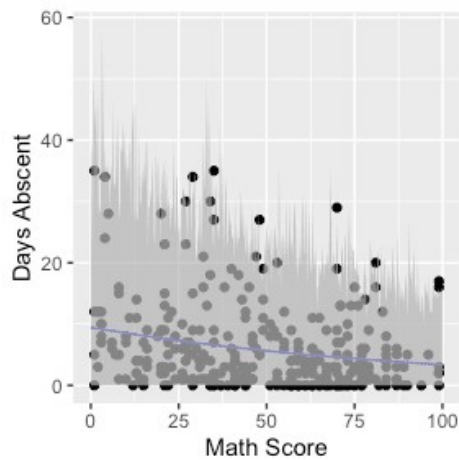

ppdiag v0.1.0: Provides a suite of diagnostic tools for univariate point processes including tools for simulating and fitting both common and more complex temporal point processes and the diagnostic tools described in Brown et al. (2002) and Wu et al. (2020). There is a vignette on Markov Modulated Point Processes and another on Diagnostic Tools.

robustlm v0.1.0: Implements a computationally efficient exponential squared loss algorithm for variable selection proposed by Wang et al.(2013). See the vignette.
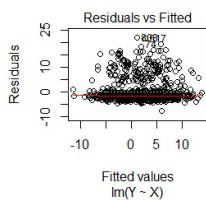
smmR v1.0.2: Provides functions to estimate and simulate multi-state semi-Markov models. The methods implemented are described in Barbu & Limnios (2008) and Trevezas & Limnios (2011). The vignette contains an extended example.
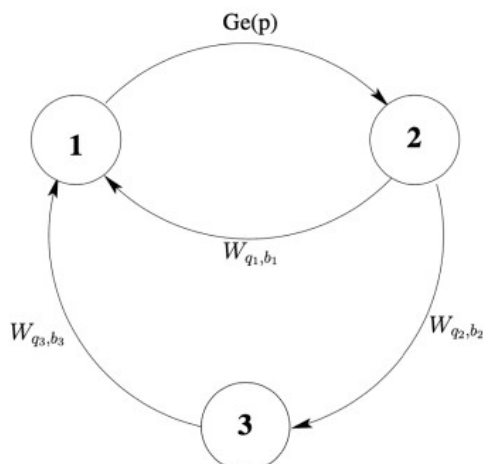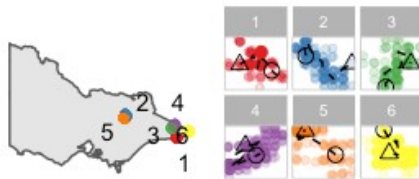

spotoroo v0.1.1: Implements an algorithm to cluster satellite hot spot data spatially and temporally. See the vignette.

Fire Movement (Δ : Start | O : End)

Fires Selected: 6
From: 2019-12-29 13:10:00
To: 2020-02-07 22:50:00

Utilities

clock v0.2.0: Provides a comprehensive library for date-time manipulations using a new family of orthogonal date-time classes (duration, time points, zoned-times, and calendars) that partition responsibilities so that the complexities of time zones are only considered when they are really needed. There is a Getting Started guide, as well as vignettes on FAQ, and Examples and Recipies.

crosstable v0.2.1: Provides functions to create descriptive tables for continuous and categorical variables, apply summary statistics, and create reports using `rmarkdown` or `officer`. There is an Introduction, and vignettes on Troubleshooting, Making Automatic Reports, and Selecting Variables.

pkgdepends v0.1.0: Provides functions to find recursive dependencies for R packages from various sources including CRAN, Bioconductor, and GitHub enabling users to obtain a consistent set of packages to install. See README to get started.

pkglite v0.1.1: Implements a tool, grammar, and standard to represent and exchange R package source code as text files. Converts one or more source packages to a text file and restores the package structures from the file. There are vignettes on Generating File Specifications, Representing Packages, and Compact Package Representation.

Visualization

datplot v1.0.0: Provides tools to process and prepare data for visualization and employs the concept of aoristic analysis. See aorist and the vignettes Data Preparation and Visualization and Visualizing Chronological Distribution.
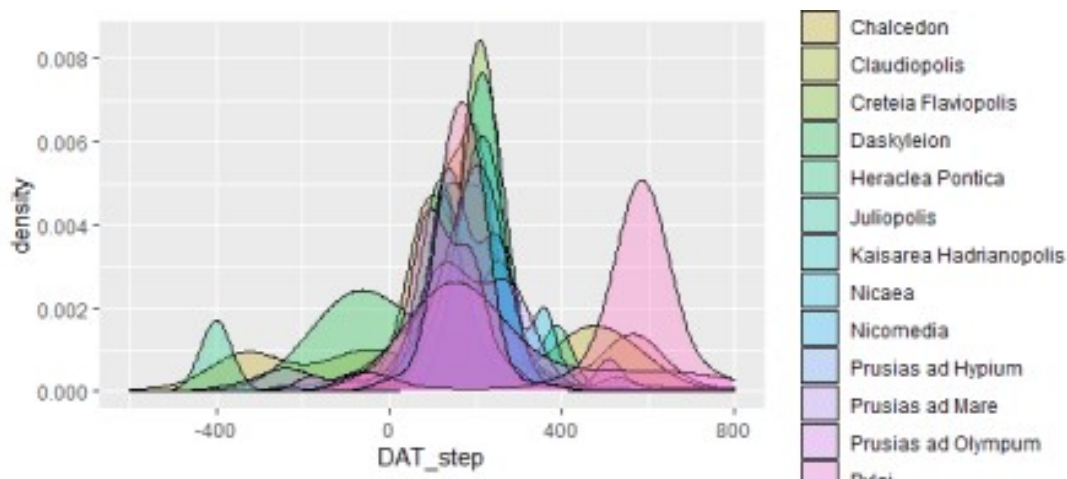
ferrn v0.0.1: Implements diagnostic plots for optimization, with a focus on projection pursuit which show paths the optimizer takes in the high-dimensional space. See README for examples.
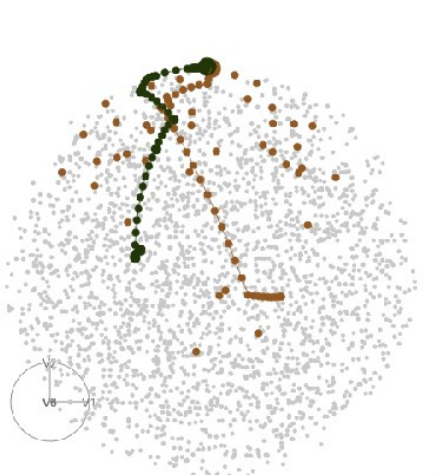
funcharts v1.0.0: Provides functional control charts for statistical process monitoring of functional data, using the methods of Capezza et al. (2020) and Centofanti et al. (2020). There are vignettes on Capezza 2020, Centofanti 2020 and on the mfd class.
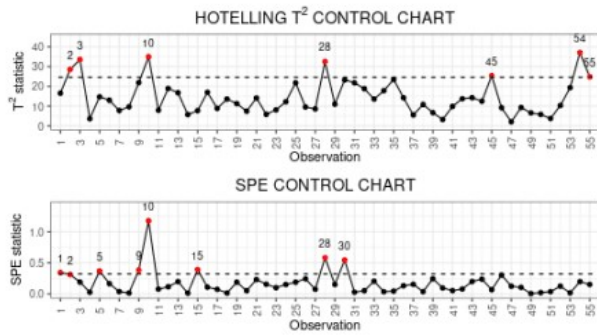
gghilbertstrings v0.3.3: Provides functions to plot Hilbert curves which are used to map one dimensional data into the 2D plane. A specific use case maps a character column in a data frame into 2D space allowing visually comparing long lists of URLs, words, genes or other data that has a fixed order and position. See README for examples.
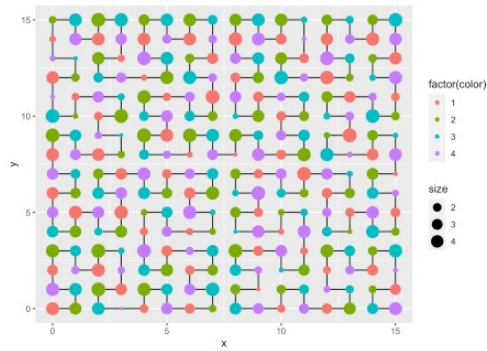
mapsf v0.1.1: Provides functions to create and integrate thematic maps including functions to design various cartographic representations such as proportional symbols, choropleth or typology maps. Look here for examples.
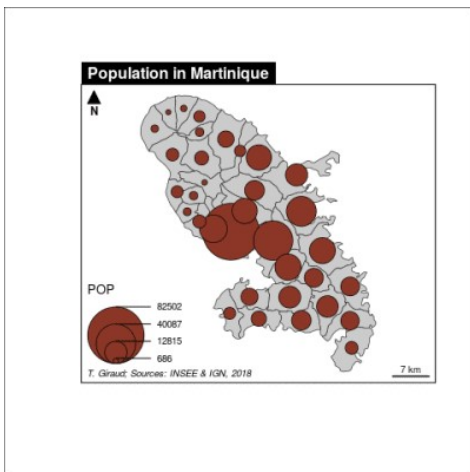
[1] I have used phrases like *By my count* and *stuck to CRAN* in the past, but I do not believe that I have explained what I mean. For some time now, but I believe more frequently in recent months, packages will appear as new on CRAN, only to be removed within a relatively short period of time for failing to resolve check problems.…