Package ‘fastverse’

November 16, 2022

Title A Suite of High-Performance Packages for Statistics and Data Manipulation

Version 0.3.0

Description Easy installation, loading and management, of high-performance packages for statistical computing and data manipulation in R. The core ‘fastverse’ consists of 4 packages: ‘data.table’, ‘collapse’, ‘kit’ and ‘magrittr’, that jointly only depend on ‘Rcpp’. The ‘fastverse’ can be freely and permanently extended with additional packages, both globally or for individual projects. Separate package verses can also be created. Fast packages for many common tasks such as time series, dates and times, strings, spatial data, statistics, data serialization, larger-than-memory processing, and compilation of R code are listed in the README file: <https://github.com/fastverse/fastverse#suggested-extensions>.

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Encoding UTF-8

Imports data.table, collapse, kit, magrittr

Suggests matrixStats, Rfast, arrow, duckdb, qs, fst, xts, roll, anytime, fasttime, stringi, stringfish, coop, rrapply, geos, lubridate, knitr, rmarkdown

URL https://fastverse.github.io/fastverse/,
https://fastverse.r-universe.dev/, https://github.com/fastverse

BugReports https://github.com/fastverse/fastverse/issues

RoxygenNote 7.1.2

NeedsCompilation yes

VignetteBuilder knitr

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Repository CRAN

Date/Publication 2022-11-15 23:30:04 UTC
The fastverse is an extensible suite of R packages, developed independently by various people, that jointly contribute to the objectives of:

1. Speeding up R through heavy use of compiled code (C, C++, Fortran)
2. Enabling more complex statistical and data manipulation operations in R
3. Reducing the number of dependencies required for advanced computing in R

Inspired by the tidyverse package, the fastverse package is a flexible package loader and manager that allows users to put together their own ‘verses’ of packages and load them with
library(fastverse).

fastverse installs 4 core packages (data.table, collapse, kit and magrittr) that provide native C/C++ code of proven quality, work well together, and enable complex statistical computing and data manipulation - with only Rcpp as an additional dependency.

fastverse also allows users to freely (and permanently) extend or reduce the number of packages in the fastverse. An overview of high-performing packages for various common tasks is provided in the README file. An overview of the package and the different ways to extend the fastverse is provided in the vignette.

Functions in the fastverse Package

Functions to extend or reduce the number of packages in the fastverse - either for the session or permanently - and to restore defaults.

fastverse_extend()
fastverse_detach()
fastverse_reset()
Function to display conflicts for *fastverse* packages (or any other attached packages)

\texttt{fastverse\_conflicts()}

Function to update *fastverse* packages (and dependencies) and install (missing) packages

\texttt{fastverse\_update()}
\texttt{fastverse\_install()}

Utilities to retrieve the names of *fastverse* packages (and dependencies), their update status, and produce a situation report

\texttt{fastverse\_packages()}
\texttt{fastverse\_deps()}
\texttt{fastverse\_sitrep()}

Function to create a fully separate extensible meta-package/verse like *fastverse*

\texttt{fastverse\_child()}

\texttt{fastverse} Options

- \texttt{options(fastverse.quiet = TRUE)} will disable all automatic messages (including conflict reporting) when calling \texttt{library(fastvsers)}, \texttt{fastverse\_extend, fastverse\_update(install = TRUE)} and \texttt{fastverse\_install}.

- \texttt{options(fastverse.styling = FALSE)} will disable all styling applied to text printed to the console.

- \texttt{options(fastverse.extend = c(...))} can be set before calling \texttt{library(fastvsers)} to extend the fastverse with some packages for the session. The same can be done with the \texttt{fastverse\_extend} function after \texttt{library(fastvsers)}, which will also populate \texttt{options("fastverse.extend")}.

- \texttt{options(fastverse.install = TRUE)} can be set before \texttt{library(fastverse)} to install any missing packages beforehand. See also \texttt{fastverse\_install}.

\texttt{fastverse} Harmonizations

There are 2 internal clashes between \texttt{collapse::funique} and \texttt{kit::funique}, and \texttt{collapse::fdroplevels} and \texttt{data.table::fdroplevels}. The \texttt{collapse} versions take precedence in both cases as they provide greater performance.

\underline{fastverse\_child} \hspace{1cm} Create a new (descendant) verse of packages

Description

Creates and installs a fully customizable descendant verse of packages that is itself extensible and inherits 90% of the functionality of the *fastverse* package.
Usage

```r
fastverse_child(
  name,  # character. The name of the child-verse e.g. 'myMLverse'.
  title,  # character. The title of the child-verse e.g. 'My Machine Learning Verse'.
  pkg,  # character. A vector of core packages for the new verse.
  maintainer,  # character. A quoted person statement giving the package maintainer.
  version = "0.1.0",  # character. A quoted version number for the new package.
  dir = ".",  # character. The directory in which a source directory dir/name for the package will be created.
  theme = c("fastverse", "tidyverse"),  # character. Set the colour-theme for text printed to the console. The options are "fastverse" or "tidyverse".
  install = TRUE,  # logical. TRUE installs the package using install.packages(dir/name, repos = NULL, type = "source", ...).
  keep.dir = TRUE,  # logical. FALSE will remove the source directory (dir/name) again after installation.
  ...  # further arguments to install.packages.
)
```

Arguments

- **name**: character. The name of the child-verse e.g. 'myMLverse'.
- **title**: character. The title of the child-verse e.g. 'My Machine Learning Verse'.
- **pkg**: character. A vector of core packages for the new verse.
- **maintainer**: character. A quoted person statement giving the package maintainer. If you do not intend to substantially modify the code of the resulting source package, `role = "cre"` is appropriate. See Examples.
- **version**: character. A quoted version number for the new package.
- **dir**: character. The directory in which a source directory dir/name for the package will be created.
- **theme**: character. Set the colour-theme for text printed to the console. The options are "fastverse" or "tidyverse".
- **install**: logical. TRUE installs the package using `install.packages(dir/name, repos = NULL, type = "source", ...)`. FALSE will remove the source directory (dir/name) again after installation.
- **keep.dir**: logical. FALSE will remove the source directory (dir/name) again after installation.
- **...**: further arguments to `install.packages`.

Details

This function creates and installs a source package according to the users specification. For that it downloads the 'child' branch of the GitHub repository, which was specifically set up to produce a new verse, unzips it into a source directory, and substitutes the user inputs into the files. The package is then installed from source, and (optionally) the source directory is removed again.

`fastverse` children inherit 90% of the functionality of the `fastverse` package: they are not permanently globally extensible and can not bear children themselves, but can be configured for projects (using a .name config file) and extended in the session. Use of this function requires an internet connection but no additional R packages (like devtools, remotes or roxygen2).

Value

`fastverse_child` returns NULL invisibly.
See Also

fastverse_extend, fastverse

Examples

```r
## Not run:

fastverse_child(
  name = "tsverse",
  title = "Time Series Package Verse",
  pkg = c("xts", "roll", "zoo", "tsbox", "urca", "tseries", "tsutils", "forecast"),
  maintainer = 'person("GivenName", "FamilyName", role = "cre", email = "your@email.com")',
  dir = "C:/Users/.../Documents",
  theme = "tidyverse"
)

## End(Not run)
```

Description

This function lists all the conflicts among fastverse packages and between fastverse packages and other attached packages. It can also be used to check conflicts for any other attached packages.

Usage

```r
fastverse_conflicts(pkg = fastverse_packages())
```

Arguments

- **pkg** character. A vector of packages to check conflicts for. The default is all fastverse packages.

Details

There are 2 internal conflict in the core fastverse which are not displayed by fastverse_conflicts():

- **collapse::funique** masks **kit::funique**. If both packages are detached, **collapse** is attached after **kit**. In general, the **collapse** version is faster and supports unique rows on selected columns, as well as sorted unique values with option **sort = TRUE**. The **kit** version is also very fast and additionally supports matrices.

- **collapse::fdroplevels** masks **data.table::fdroplevels**. The former is faster and supports arbitrary data structures, whereas the latter has options to exclude certain levels from being dropped.
Value

An object of class 'fastverse_conflicts': A named list of character vectors where the names are the conflicted objects, and the content are the names of the package namespaces containing the object, in the order they appear on the search path.

See Also

fastverse

Examples

# Check conflicts between fastverse packages and all attached packages
fastverse_conflicts()

# Check conflicts among all attached packages
fastverse_conflicts(rm_stub(search()[-1], "package:"))

### fastverse_deps List all fastverse dependencies

Description

Lists all fastverse dependencies and the local and repository (e.g. CRAN) versions of packages and dependencies.

Usage

```r
fastverse_deps(
  pkg = fastverse_packages(),
  recursive = FALSE,
  repos = getOption("repos"),
  include.self = FALSE,
  check.deps = TRUE
)
```

Arguments

- `pkg` character vector of packages to check dependencies and versions of. The default is all fastverse packages.
- `recursive` logical. TRUE recursively determines all packages required to operate these packages. FALSE will only list the packages and their direct dependencies.
- `repos` character vector. Base URL(s) of the repositories to use, e.g., the URL of a CRAN mirror such as "https://cloud.r-project.org". The macro .fastverse_repos contains the URL of the fastverse r-universe server to check/install the development version of packages.
- `include.self` logical. TRUE also includes the fastverse package and checks against the repository version.
check.deps logical. FALSE will not determine dependencies but only display the update status of packages in pkg.

Value

A data frame giving the package names, the repository and local version, and a logical variable stating whether the local version is behind the repository version.

See Also

fastverse_sitrep, fastverse

---

fastverse_detach  

### Description

Detaches (fastverse) packages, removing them from the search path.

### Usage

```r
fastverse_detach(
  ..., 
  unload = FALSE, 
  force = FALSE, 
  include.self = TRUE, 
  session = FALSE, 
  permanent = FALSE
)
```

### Arguments

- `...` comma-separated package names, quoted or unquoted, or vectors of package names. If left empty, all packages returned by `fastverse_packages` are detached.
- `unload` logical. TRUE also unloads the packages using `detach(name, unload = TRUE)`.
- `force` logical. should a fastverse package be detached / unloaded even though other attached packages depend on it?
- `include.self` logical. TRUE also includes the fastverse package - only applicable if `...` is left empty.
- `session` logical. TRUE also removes the packages from `options("fastverse.extend")`, so they will not be attached again with `library(fastverse)` in the current session. If `...` is left empty and `include.self = TRUE`, this will clear all fastverse options set for the session.
permanent logical. If ... are used to detach certain packages, permanent = TRUE will disable them being loaded the next time the fastverse is loaded. This is implemented via a config file saved to the package directory. Core fastverse packages can also be detached in this way. To add a package again use extend_fastverse(..., permanent = TRUE). The config file can be removed with fastverse_reset.

Value

fastverse_detach returns NULL invisibly.

See Also

fastverse_extend, fastverse

---

fastverse_extend Extend the fastverse

**Description**

Loads additional packages as part of the fastverse. By default only for the session, but extensions can be saved up to reinstallation/updating of the fastverse package.

**Usage**

fastverse_extend(
  ..., install = FALSE,
  permanent = FALSE,
  check.conflicts = !isTRUE(getOption("fastverse.quiet")),
  topics = NULL,
  repos = getOption("repos")
)

**Arguments**

... comma-separated package names, quoted or unquoted, or vectors of package names.

install logical. Install packages not available?

permanent logical. Should packages be saved and included when library(fastverse) is called next time? Implemented via a config file saved to the package directory. The file will be removed if the fastverse is reinstalled, and can be removed without reinstallation using fastverse_reset. Packages can be removed from the config file using fastverse_detach(..., permanent = TRUE).

check.conflicts logical. Should conflicts between extension packages and attached packages be checked?
**fastverse_extend**

topics  
deprecated argument used to bulk-attach or install suggested extension packages prior to v0.3.0.

repos  
character vector. Base URL(s) of the repositories to use, e.g., the URL of a CRAN mirror such as "https://cloud.r-project.org". The macro `fastverse_repos` contains the URL of the fastverse r-universe server to check/install the development version of packages.

Details

The `fastverse` can be extended using a free choice of packages. An overview of high-performing packages for various tasks is provided in the README file.

When the `fastverse` is extended calling `fastverse_extend(...)`, the packages that are not attached are attached, but conflicts are checked for all specified packages. If `permanent = FALSE`, an `options("fastverse.extend")` is set which stores these extension packages, regardless of whether they were already attached or not. When calling `fastverse_packages, fastverse_deps, fastverse_conflicts, fastverse_update, fastverse_sitrep` or `fastverse_detach`, these packages are included as part of the `fastverse`. This is also the case if `permanent = TRUE`, with the only difference that instead of populating the option, a file is saved to the package directory such that the packages are also loaded (as part of the core `fastverse`) when calling `library(fastverse)` in the next session. To extend the `fastverse` for the current session when it is not yet loaded, users can also set `options(fastverse.extend = c(...))`, where `c(...)` is a character vector of package names, before calling `library(fastverse)`.

Value

`fastverse_extend` returns NULL invisibly.

See Also

`fastverse_detach, fastverse`

Examples

```r
ex <- getOption("fastverse.extend")
fastverse_extend(xts, stringi, fasttime)

# Undoing this again
fastverse_detach(setdiff(getOption("fastverse.extend"), ex), session = TRUE)
rm(ex)
```
Install (missing) fastverse packages

Description

This function (by default) checks if any fastverse package is missing and installs the missing package(s). The development versions of fastverse packages can also be installed from r-universe. The link to the repository is contained in the .fastverse_repos macro.

Usage

```r
fastverse_install(
  ..., 
  only.missing = TRUE, 
  install = TRUE, 
  repos = getOption("repos")
)
```

Arguments

- `...`: comma-separated package names, quoted or unquoted, or vectors of package names. If left empty, all packages returned by `fastverse_packages` are checked.
- `only.missing`: logical. TRUE only installs packages that are unavailable. FALSE installs all packages, even if they are available.
- `install`: logical. TRUE will proceed to install packages, whereas FALSE (recommended) will print the installation command asking you to run it in a clean R session.
- `repos`: character vector. Base URL(s) of the repositories to use, e.g., the URL of a CRAN mirror such as "https://cloud.r-project.org". The macro `.fastverse_repos` contains the URL of the fastverse r-universe server to check/install the development version of packages.

Value

`fastverse_install` returns NULL invisibly.

Note

There is also the possibility to set `options(fastverse.install = TRUE)` before `library(fastverse)`, which will call `fastverse_install()` before loading any packages to make sure all packages are available. If you are using a .fastverse configuration file inside a project (see vignette), you can also place `_opt_fastverse.install = TRUE` before the list of packages in that file.

See Also

`fastverse_update`, `fastverse`
fastverse_packages

List all packages in the fastverse

Description

Core packages are first fetched from a project-level configuration file (if found), else from a global configuration file (if found), otherwise the standard set of core packages is returned. In addition, if extensions = TRUE, any packages used to extend the fastverse for the current session (fetched from getOption("fastverse.extend")) are also returned.

Usage

fastverse_packages(extensions = TRUE, include.self = TRUE)

Arguments

extensions logical. TRUE appends the set of core packages with all packages found in options("fastverse.extend").
include.self logical. Include the fastverse package in the list?

Value

A character vector of package names.

See Also

fastverse_extend, fastverse

Examples

fastverse_packages()

fastverse_reset

Reset the fastverse to defaults

Description

Calling this function will remove global configuration files and (default) clear all package options. Attached packages will not be detached, and configuration files for projects (as discussed in the vignette) will not be removed.

Usage

fastverse_reset(options = TRUE)
Arguments

options logical. TRUE also clears all fastverse options.

Value

fastverse_reset returns NULL invisibly.

See Also

fastverse_extend, fastverse

---

**fastverse_sitrep**

Get a situation report on the fastverse

Description

This function gives a quick overview of the version of R and all fastverse packages (including availability updates for packages) and indicates whether any global or project-level configuration files are used (as described in more detail the vignette).

Usage

fastverse_sitrep(...)  

Arguments

... arguments other than pkg passed to fastverse_deps.

Value

fastverse_sitrep returns NULL invisibly.

See Also

fastverse_deps, fastverse
Description

This will check all fastverse packages (and their dependencies) for updates and (optionally) install those updates.

Usage

fastverse_update(..., install = FALSE, repos = getOption("repos"))

Arguments

... arguments passed to fastverse_deps.
install logical. TRUE will proceed to install outdated packages, whereas FALSE (recommended) will print the installation command asking you to run it in a clean R session.
repos character vector. Base URL(s) of the repositories to use, e.g., the URL of a CRAN mirror such as "https://cloud.r-project.org". The macro .fastverse_repos contains the URL of the fastverse r-universe server to check/install the development version of packages.

Value

fastverse_update returns NULL invisibly.

See Also

fastverse_deps, fastverse

Examples

## Not run:
## Update from CRAN
fastverse_update()

## Update from R-Universe (development versions)
fastverse_update(repos = .fastverse_repos)

## End(Not run)
is_attached

<table>
<thead>
<tr>
<th>is_attached</th>
<th>Utilities</th>
</tr>
</thead>
</table>

**Description**
Checks if packages are installed or attached.

**Usage**

```r
is_attached(x)

is_installed(x)
```

**Arguments**

- `x` character. A vector of package names.

**Value**

A named logical vector.
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