Package 'instantiate'

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Title Pre-Compiled 'CmdStan' Models in R Packages

Description Similar to 'rstantools' for 'rstan',
the 'instantiate' package builds pre-compiled
'CmdStan' models into CRAN-ready statistical modeling R packages.
The models compile once during installation,
the executables live inside the file systems of their respective packages,
and users have the full power and convenience of
'cmdstanr' without any additional compilation after package installation.
This approach saves time and helps R package developers
migrate from 'rstan' to the more modern 'cmdstanr'.
Packages 'rstantools', 'cmdstanr', 'stannis', and
'stanapi' are similar Stan clients with different objectives.

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https://github.com/wlandau/instantiate

BugReports https://github.com/wlandau/instantiate/issues

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`instantiate-package` *instantiate: pre-compiled CmdStan models in R packages*

Description

Similar to `rstantools` for `rstan`, the `instantiate` package builds pre-compiled `CmdStan` models into CRAN-ready statistical modeling R packages. The models compile once during installation, the executables live inside the file systems of their respective packages, and users have the full power and convenience of `CmdStanR` without any additional compilation after package installation. This approach saves time and helps R package developers migrate from `rstan` to the more modern `CmdStanR`.

`stan_cmdstan_exists` *Check if* `instantiate` *can find CmdStanR and CmdStan.*

Description

Check if `instantiate` can find CmdStanR and CmdStan.

Usage

```
stan_cmdstan_exists(
  cmdstan_install = Sys.getenv("CMDSTAN_INSTALL", unset = "")
)
```

Arguments

`cmdstan_install`

Character of length 1, how to look for an installed copy of CmdStan. See https://wlandau.github.io/instantiate/ for details. Choices:

1. `""` (default): look at the original value that the `CMDSTAN_INSTALL` environment variable contained when `instantiate` at the time when it was installed. If it was `"implicit"` or `"fixed"`, then choose the corresponding option below. Otherwise, default to `"implicit"`.
2. `"implicit"`: Let the `cmdstanr::cmdstan_path()` decide where to look for CmdStan. As explained in the `cmdstanr` documentation, the output of `cmdstanr::cmdstan_path()` depends on the current value of the `CMDSTAN` environment variable. The `cmdstanr` package must be installed. If it is not installed, then `stan_cmdstan_path()` returns the empty string `""`.
3. `"fixed"`: Use the path to CmdStan that was originally contained in `Sys.getenv("CMDSTAN")` at the time when `instantiate` was installed.

Value

`TRUE` if `instantiate` can find the CmdStanR R package and the CmdStan command line tool. Returns `FALSE` otherwise.

See Also

Other cmdstan: `stan_cmdstan_version()`

Examples

```
stan_cmdstan_exists()
```

`stan_cmdstan_path` *Path to CmdStan for* `instantiate`

Description

Return the directory path to CmdStan that the `instantiate` package uses.

Usage

```
stan_cmdstan_path(cmdstan_install = Sys.getenv("CMDSTAN_INSTALL", unset = ""))
```

Arguments

`cmdstan_install`

Character of length 1, how to look for an installed copy of CmdStan. See https://wlandau.github.io/instantiate/ for details. Choices:

1. "" (default): look at the original value that the CMDSTAN_INSTALL environment variable contained when instantiate at the time when it was installed. If it was "implicit" or "fixed", then choose the corresponding option below. Otherwise, default to "implicit".
2. "implicit": Let the cmdstanr::cmdstan_path() decide where to look for CmdStan. As explained in the cmdstanr documentation, the output of cmdstanr::cmdstan_path() depends on the current value of the CMDSTAN environment variable. The cmdstanr package must be installed. If it is not installed, then stan_cmdstan_path() returns the empty string "".
3. "fixed": Use the path to CmdStan that was originally contained in Sys.getenv("CMDSTAN") at the time when instantiate was installed.

Value

Character of length 1, directory path to CmdStan. The path may or may not exist. Returns the empty string "" if the path cannot be determined.

See Also

Other packages: stan_package_clean(), stan_package_compile(), stan_package_configure(), stan_package_model_files()

Examples

```
stan_cmdstan_path()
```

---

stan_cmdstan_version *Version of CmdStan that* instantiate *uses.*

Description

Return the version of CmdStan that the instantiate package uses.

Usage

```
stan_cmdstan_version(
  cmdstan_install = Sys.getenv("CMDSTAN_INSTALL", unset = ""),
  error_on_NA = TRUE
)
```

Arguments

cmdstan_install

Character of length 1, how to look for an installed copy of CmdStan. See https://wlandau.github.io/instantiate/ for details. Choices:

1. "" (default): look at the original value that the CMDSTAN_INSTALL environment variable contained when instantiate at the time when it was installed. If it was "implicit" or "fixed", then choose the corresponding option below. Otherwise, default to "implicit".
2. "implicit": Let the cmdstanr::cmdstan_path() decide where to look for CmdStan. As explained in the cmdstanr documentation, the output of cmdstanr::cmdstan_path() depends on the current value of the CMDSTAN environment variable. The cmdstanr package must be installed. If it is not installed, then stan_cmdstan_path() returns the empty string "".
3. "fixed": Use the path to CmdStan that was originally contained in Sys.getenv("CMDSTAN") at the time when instantiate was installed.

error_on_NA Logical of length 1, whether an error should be thrown if CmdStan is not found.

Value

Character of length 1, version of CmdStan that the instantiate package uses. If CmdStan is not found, then the return value depends on the error_on_NA argument.

See Also

Other cmdstan: stan_cmdstan_exists()

Examples

```
if (stan_cmdstan_exists()) {
  message(stan_cmdstan_version())
}
```

---

stan_package_clean *Remove one or more compiled Stan models in an R package.*

Description

Remove one or more compiled Stan models from the file system of an R package.

Usage

```
stan_package_clean(models = instantiate::stan_package_model_files())
```

Arguments

models Character vector of file paths to Stan model source code files. Defaults to the Stan files in ./src/stan/ because all the Stan model files must live in the src/stan/ folder for an R package built with instantiate.

Value

NULL (invisibly). Called for its side effects.

See Also

Other packages: stan_cmdstan_path(), stan_package_compile(), stan_package_configure(), stan_package_model_files()

Examples

```
if (identical(Sys.getenv("INSTANTIATE_EXAMPLES"), "true")) {
path <- tempfile()
stan_package_create(path = path)
stan_package_configure(path = path)
models <- stan_package_model_files(path)
list.files(file.path(path, "src", "stan"))
stan_package_compile(models)
list.files(file.path(path, "src", "stan"))
# Clean up the compiled Stan model files:
stan_package_clean(models = models)
list.files(file.path(path, "src", "stan"))
}
```

---

stan_package_compile *Compile the Stan models in an R package.*

Description

Compile all Stan models in a directory, usually in a package.

Usage

```
stan_package_compile(
  models = instantiate::stan_package_model_files(),
  cmdstan_install = Sys.getenv("CMDSTAN_INSTALL", unset = ""),
  verbose = TRUE,
  quiet = FALSE,
  pedantic = FALSE,
  include_paths = NULL,
  user_header = NULL,
  cpp_options = list(),
  stanc_options = list(),
  force_recompile = getOption("cmdstanr_force_recompile", default = FALSE),
  threads = NULL,
  ...
)
```

Arguments

models	Character vector of file paths to Stan model source code files. Defaults to the Stan files in ./src/stan/ because all the Stan model files must live in the src/stan/ folder for an R package built with instantiate.

`cmdstan_install`
: Character of length 1, how to look for an installed copy of CmdStan. See https://wlandau.github.io/instantiate/ for details. Choices:

  1. `""` (default): look at the original value that the `CMDSTAN_INSTALL` environment variable contained when `instantiate` at the time when it was installed. If it was `"implicit"` or `"fixed"`, then choose the corresponding option below. Otherwise, default to `"implicit"`.
  2. `"implicit"`: Let the `cmdstanr::cmdstan_path()` decide where to look for CmdStan. As explained in the `cmdstanr` documentation, the output of `cmdstanr::cmdstan_path()` depends on the current value of the `CMDSTAN` environment variable. The `cmdstanr` package must be installed. If it is not installed, then `stan_cmdstan_path()` returns the empty string `""`.
  3. `"fixed"`: Use the path to CmdStan that was originally contained in `Sys.getenv("CMDSTAN")` at the time when `instantiate` was installed.

`verbose`
: Logical of length 1, whether to set the `cmdstanr_verbose` global option to print more compiler messages than usual.

`quiet`
: Argument to `cmdstanr::cmdstan_model()` to control compilation.

`pedantic`
: Logical of length 1, whether to activate pedantic mode when compiling the Stan models. See the `cmdstanr` documentation for details.

`include_paths`
: Argument to `cmdstanr::cmdstan_model()` to control model compilation.

`user_header`
: Argument to `cmdstanr::cmdstan_model()` to control model compilation.

`cpp_options`
: Argument to `cmdstanr::cmdstan_model()` to control model compilation.

`stanc_options`
: Argument to `cmdstanr::cmdstan_model()` to model control compilation.

`force_recompile`
: Argument to `cmdstanr::cmdstan_model()` to model control compilation.

`threads`
: Deprecated on 2026-04-07 (version 0.2.3.9003). `cmdstanr::cmdstan_model()` no longer accepts a `threads` argument.

`...`
: Other named arguments to `cmdstanr::cmdstan_model()`.

Details

If building a package using `instantiate`, all Stan model files must live in a folder called `src/stan/` in the package source directory.

Value

`NULL` (invisibly). Called for its side effects.

See Also

Other packages: `stan_cmdstan_path()`, `stan_package_clean()`, `stan_package_configure()`, `stan_package_model_files()`

Examples

```
if (identical(Sys.getenv("INSTANTIATE_EXAMPLES"), "true")) {
path <- tempfile()
stan_package_create(path = path)
stan_package_configure(path = path)
models <- stan_package_model_files(path)
list.files(file.path(path, "src", "stan"))
stan_package_compile(models)
list.files(file.path(path, "src", "stan"))
}
```

`stan_package_configure` *Configure an R package with built-in Stan models.*

Description

Write configuration files in an R package which compile all the Stan models in `src/stan/` when the package installs.

Usage

```
stan_package_configure(path = getwd(), overwrite = FALSE)
```

Arguments

`path`	Character of length 1, file path to the package which will contain Stan models in `src/stan/` at installation time.
`overwrite`	Logical of length 1, whether to overwrite any existing configuration files.

Details

Writes configuration scripts `configure` and `configure.win` in the directory specified by the `path` argument.

Value

`NULL` (invisibly). Called for its side effects.

See Also

Other packages: `stan_cmdstan_path()`, `stan_package_clean()`, `stan_package_compile()`, `stan_package_model_files()`

Examples

```
if (identical(Sys.getenv("INSTANTIATE_EXAMPLES"), "true")) {
path <- tempfile()
stan_package_create(path = path)
list.files(path)
stan_package_configure(path = path)
list.files(path)
}
```

`stan_package_create` *Create example package with a built-in Stan model.*

Description

Create an example package with a Stan model inside.

Usage

```
stan_package_create(path = tempfile())
```

Arguments

`path`	Path to write the package. Must not already exist.

Details

After creating the package, the next step is to configure it with `stan_package_configure()`. After that, install it as an ordinary R package to automatically compile the models.

Value

`NULL` (invisibly). Called for its side effects.

Examples

```
if (identical(Sys.getenv("INSTANTIATE_EXAMPLES"), "true")) {
path <- tempfile()
stan_package_create(path = path)
list.files(path)
}
```

stan_package_model *Get a pre-compiled Stan model built into an R package.*

Description

Get the cmdstanr model object for a pre-compiled Stan model inside a package.

Usage

```
stan_package_model(
  name,
  package,
  library = NULL,
  cmdstan_install = Sys.getenv("CMDSTAN_INSTALL", unset = ""),
  compile = FALSE,
  include_paths = NULL,
  ...
)
```

Arguments

name	Character of length 1, base name of the Stan model file (without the containing directory or .stan file extension).
package	Character of length 1, name of the R package to look for the built-in Stan model.
library	Character of length 1 or NULL, library path to look for the package with the built-in Stan model. Passed to the lib.loc argument of system.file().
cmdstan_install	Character of length 1, how to look for an installed copy of CmdStan. See https://wlandau.github.io/instantiate/ for details. Choices: 1. "" (default): look at the original value that the CMDSTAN_INSTALL environment variable contained when instantiate at the time when it was installed. If it was "implicit" or "fixed", then choose the corresponding option below. Otherwise, default to "implicit". 2. "implicit": Let the cmdstanr::cmdstan_path() decide where to look for CmdStan. As explained in the cmdstanr documentation, the output of cmdstanr::cmdstan_path() depends on the current value of the CMDSTAN environment variable. The cmdstanr package must be installed. If it is not installed, then stan_cmdstan_path() returns the empty string "". 3. "fixed": Use the path to CmdStan that was originally contained in Sys.getenv("CMDSTAN") at the time when instantiate was installed.
compile	TRUE to compile the model and store the executable file where the package is installed in .libPaths(). FALSE to use the executable already installed there, which is usually the case. If the executable is missing, the model is compiled either way.

include_paths — Argument to cmdstanr::cmdstan_model() to control model compilation. Used only when compile is TRUE or the executable is missing.

... — Named arguments passed to cmdstanr::cmdstan_model(). Used only when compile is TRUE or the executable is missing.

Details

Packages configured with instantiate compile their Stan models on installation. Then the stan_package_model() function retrieves the cmdstanr::cmdstan_model() object without needing to re-compile the model.
Please see the documentation website of the instantiate package for examples.

Value

An R6 Stan model object from the cmdstanr package. Please visit the documentation website at https://mc-stan.org/cmdstanr/ for detailed information on the composition of this model object and how to use it to conduct Bayesian inference.

Examples

```
# Please see the documentation website of the {instantiate} package
#   for examples.
```

---

stan_package_model_files

List Stan model file paths.

Description

List all the paths to the Stan model files in a package.

Usage

```
stan_package_model_files(path = getwd())
```

Arguments

path — Character of length 1, root path to start from when searching for Stan model files.

Details

All Stan models must live in the src/stan/ directory in the package file system.

Value

Character vector of paths to Stan model files in the package.

See Also

Other packages: stan_cmdstan_path(), stan_package_clean(), stan_package_compile(), stan_package_configure()

Examples

```
path <- tempfile()
stan_package_create(path = path)
stan_package_model_files(path)
```

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