

Package ‘pfr’

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Type Package

Title Interface to the 'C++' Library 'Pf'

Version 1.0.1

Description Builds and runs 'c++' code for classes that encapsulate state space model, particle filtering algorithm pairs.
Algorithms include the Bootstrap Filter from Gordon et al. (1993) <[doi:10.1049/ip-f-2.1993.0015](https://doi.org/10.1049/ip-f-2.1993.0015)>, the generic SISR filter, the Auxiliary Particle Filter from Pitt et al (1999) <[doi:10.2307/2670179](https://doi.org/10.2307/2670179)>, and a variety of Rao-Blackwellized particle filters inspired by Andrieu et al. (2002) <[doi:10.1111/1467-9868.00363](https://doi.org/10.1111/1467-9868.00363)>. For more details on the 'c++' library 'pfr', see Brown (2020) <[doi:10.21105/joss.02599](https://doi.org/10.21105/joss.02599)>.

License GPL (>= 3)

Imports inline (>= 0.3.19), methods, rstudioapi (>= 0.13)

RoxygenNote 7.2.1

Encoding UTF-8

Suggests BH, Rcpp (>= 1.0.11), RcppEigen, knitr (>= 1.39), rmarkdown (>= 2.23)

VignetteBuilder knitr, rmarkdown

NeedsCompilation no

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buildModelFuncs	<i>Build c++ particle filtering code for your R session.</i>
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Description

Build c++ particle filtering code for your R session.

Usage

```
buildModelFuncs(myDir, modelName, verbose = FALSE)
```

Arguments

myDir	directory with your three code files (i.e. model header, model source and export code)
modelName	your model name. Must be in all lowercase, and be a substring of the above-mentioned filenames
verbose	logical and passed in to inline::cxxfunction()

Value

an Rcpp Module object

Examples

```
## Not run:
# compile everything from scratch
svol_lev <- buildModelFuncs("~/Desktop", "svol_leverage")

# then use your model's log-likelihood and filtering functions
svol_lev$svol_leverage_bswc_approx_LL(rnorm(100), c(.9, 0.0, 1.0, -.2))
svol_lev$svol_leverage_bswc_approx_filt(rnorm(100), c(.9, 0.0, 1.0, -.2))

## End(Not run)
```

createPFCPPTemplates	<i>Create c++ template files for bootstrap filters (with or without covariates), auxiliary particle filters, sequential importance sampling with resampling filters, or Rao-Blackwellized/Marginal particle filters.</i>
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Description

Create c++ template files for bootstrap filters (with or without covariates), auxiliary particle filters, sequential importance sampling with resampling filters, or Rao-Blackwellized/Marginal particle filters.

Usage

```
createPFCPPTemplates(modname, pfAlgo, fileDir, openNow = TRUE)
```

Arguments

modname	name of model in all lowercase
pfAlgo	Either "BSF", "APF", "BSWC", "SISR", "RBPFHMM", or "RBPFKALMAN"
fileDir	where to save files. Not saved if NULL (but three files are returned in list).
openNow	TRUE if you want to open this now in RStudio. Ignored if fileDir is NULL.

Value

NULL if saving files, otherwise a list with three character vectors

Examples

```
# return in list of character strings
createPFCPPTemplates("coolmod", "BSF", fileDir = NULL)

## Not run:
# save three files to Desktop, and
# begin editing them in rstudio IDE
createPFCPPTemplates("coolmod", "BSF", fileDir = "~/Desktop/")

## End(Not run)
```

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