Package ‘pfr’

December 8, 2023

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>, the generic SISR filter,
the Auxiliary Particle Filter from Pitt et al (1999) <doi:10.2307/2670179>, and a variety of Rao-Blackwellized
particle filters inspired by Andrieu et al. (2002) <doi:10.1111/1467-9868.00363>. For more details on the 'c++' library
'pf', see Brown (2020) <doi: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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R topics documented:

`buildModelFuncs` *Build c++ particle filtering code for your R session.*

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` *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.*

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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