Package ‘parglms’

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Title support for parallelized estimation of GLMs/GEEs

Version 1.41.0

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Description This package provides support for parallelized estimation of GLMs/GEEs, catering for dispersed data.

Suggests RUnit, sandwich, MASS, knitr, GenomeInfoDb, GenomicRanges, gwascat, BiocStyle, rmarkdown

VignetteBuilder knitr

Depends methods

Imports BiocGenerics, BatchJobs, foreach, doParallel

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BiocViews statistics, genetics

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Contents

`parglms-package` *support for parallelized estimation of GLMs/GEEs*

Description

This package provides support for parallelized estimation of GLMs/GEEs, catering for dispersed data.

Details

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In version 0.0.0 we established an approach to fitting GLM from data that have been persistently dispersed and managed by a `Registry`.

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References

This package shares an objective with the `bigglm` methods of `biglm`. In `bigglm`, a small-RAM-footprint algorithm is employed, with sequential chunking to update statistics in each iteration. In `parGLM` the footprint is likewise controllable, but statistics in each iteration are evaluated in parallel over chunks.

Examples

```
showMethods("parGLM")
```

`parGLM-methods` *fit GLM-like models with parallelized contributions to sufficient statistics*

Description

This package addresses the problem of fitting GLM-like models in a scalable way, recognizing that data may be dispersed, with chunks processed in parallel, to create low-dimensional summaries from which model fits may be constructed.

Methods

`signature(formula = "formula", store = "Registry")` The model data are assumed to lie in the `file.dir/jobs/*` folders, with `file.dir` defined in the `store`, which is an instance of `Registry`.

Additional arguments must be supplied:

family a function that serves as a family for stats::glm

binit a vector of initial values for regression parameter estimation, must conform to expectations of `formula`

maxit an integer giving the maximum number of iterations allowed

tol a numeric giving the tolerance criterion

Failure to specify these triggers a fatal error.

The Registry instance can be modified to include a list element 'extractor'. This must be a function with arguments `store`, and codei. The standard extraction function is

`function(store, i) loadResult(store, i)`

It must return a data frame, conformant with the expectations of `formula`. Limited checking is performed.

The predict method computes the linear predictor on data identified by jobid in a BatchJobs registry. Results are returned as output of foreach over the jobids specified in the predict call.

Note that setting option parGLM.showiter to TRUE will provide a message tracing progress of the optimization.

Examples

```
if (require(MASS) & require(BatchJobs)) {
# here is the 'sharding' of a small dataset
 data(anorexia)  # N = 72
# in .BatchJobs.R:
# best setting for sharding a small dataset on a small machine:
# cluster.functions = BatchJobs::makeClusterFunctionsInteractive()
 myr = makeRegistry("abc", file.dir=tempfile())
 chs = chunk(1:nrow(anorexia), n.chunks=18) # 4 recs/chunk
 f = function(x) {library(MASS); data(anorexia); anorexia[x,]}
 batchMap(myr, f, chs)
 submitJobs(myr) # now getResult(myr,1) gives back a data.frame
 waitForJobs(myr) # simple dispersal
# now myr is populated
 oldopt = options()$parGLM.showiter
 options(parGLM.showiter=TRUE)
 pp = parGLM( Postwt ~ Treat + Prewt, myr,
   family=gaussian, binit = c(0,0,0,0), maxit=10, tol=.001 )
 print(summary(theLM <- lm(Postwt~Treat+Prewt, data=anorexia)))
 print(pp$coefficients - coef(theLM))
 if (require(sandwich)) {
   hc0 <- vcovHC(theLM, type="HC0")
   print(pp$robust.variance - hc0)
   }
 }
 predict(pp, store=myr, jobids=2:3)
 options(parGLM.showiter=oldopt)
```

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