

# Package ‘parglms’

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**Title** support for parallelized estimation of GLMs/GEEs

**Version** 1.40.0

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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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**License** Artistic-2.0

**LazyLoad** yes

**BiocViews** statistics, genetics

**ByteCompile** TRUE

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## Contents

parglms-package	2
parGLM-methods	2
Index	4

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parGLMs-package

*support for parallelized estimation of GLMs/GEEs*

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### 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](#).

### Author(s)

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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")
```

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parGLM-methods

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

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### 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)
```

# Index

- \* **methods**
  - parGLM-methods, [2](#)
- \* **modeling**
  - parGLM-methods, [2](#)
- \* **package**
  - parGLMs-package, [2](#)
- parGLM (parGLM-methods), [2](#)
- parGLM, formula, Registry-method
  - (parGLM-methods), [2](#)
- parGLM-methods, [2](#)
- parGLMs (parGLMs-package), [2](#)
- parGLMs-package, [2](#)
- predict (parGLM-methods), [2](#)
- print (parGLM-methods), [2](#)
- Registry, [2](#), [3](#)
- summary (parGLM-methods), [2](#)