

# Package: eegkitdata (via r-universe)

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**Type** Package

**Title** Electroencephalography Toolkit Datasets

**Version** 1.1

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**Description** Contains the example EEG data used in the package eegkit.  
Also contains code for easily creating larger EEG datasets from  
the EEG Database on the UCI Machine Learning Repository.

**License** GPL (>= 2)

**NeedsCompilation** no

**Depends** R (>= 2.10)

**Repository** CRAN

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eegkitdata-package      *Electroencephalography Toolkit Datasets*

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## Description

Contains the example EEG data used in the package eegkit. Also contains code for easily creating larger EEG datasets from the EEG Database on the UCI Machine Learning Repository.

## Details

The data file `eegdata` contains 64-channel EEG data recorded from 10 alcoholic and 10 control subjects. The function `geteegdata` can be used to create larger EEG datasets from the EEG Database on the UCI Machine Learning Repository.

## Author(s)

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## References

Bache, K. & Lichman, M. (2013). UCI Machine Learning Repository [<http://archive.ics.uci.edu/ml>]. Irvine, CA: University of California, School of Information and Computer Science.

Begleiter, H. *Neurodynamics Laboratory*. State University of New York Health Center at Brooklyn.

Helwig, N.E. (2014). *eegkit: Toolkit for electroencephalography data*. <http://CRAN.R-project.org/package=eegkit>

Ingber, L. (1997). Statistical mechanics of neocortical interactions: Canonical momenta indicators of electroencephalography. *Physical Review E*, 55, 4578-4593.

Ingber, L. (1998). Statistical mechanics of neocortical interactions: Training and testing canonical momenta indicators of EEG. *Mathematical Computer Modelling*, 27, 33-64.

## Examples

```
# See examples for eegcap, eegtime, eegspace, eegica, and eegsmooth (in package eegkit)
```

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eegdata

*EEG Data from Alcoholic and Control Subjects*

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## Description

Contains 64-channel electroencephalography (EEG) data from 10 alcoholic and 10 control subjects participating in a visual event-related potential (ERP) experiment. Data frame contains 5 trials (replications) from each subject. Data were recorded at 256 Hz for 1 second following the presentation of the visual stimulus.

## Usage

```
data(eegdata)
```

**Format**

A data frame with 1638400 observations and the following 7 variables:

**subject** Subject identification numbers (factor).

**group** Subject group: "a" for alcoholic and "c" for control (factor).

**condition** Experimental condition: "S1" (factor).

**trial** Trial number for each replication (integer).

**channel** Channel from which data was recorded (factor).

**time** Time point at which data was recorded: 0,1,...,255 (integer).

**voltage** Recorded EEG voltage in microvolts (numeric).

**Details**

Created from UCI MLR EEG training data using [geteegdata](#) with option nt=5.

**Author(s)**

Nathaniel E. Helwig <helwig@umn.edu>

**Source**

Bache, K. & Lichman, M. (2013). UCI Machine Learning Repository [<http://archive.ics.uci.edu/ml>]. Irvine, CA: University of California, School of Information and Computer Science.

Begleiter, H. *Neurodynamics Laboratory*. State University of New York Health Center at Brooklyn.

Ingber, L. (1997). Statistical mechanics of neocortical interactions: Canonical momenta indicators of electroencephalography. *Physical Review E*, 55, 4578-4593.

Ingber, L. (1998). Statistical mechanics of neocortical interactions: Training and testing canonical momenta indicators of EEG. *Mathematical Computer Modelling*, 27, 33-64.

**Examples**

```
# see examples for eegtime, eegspace, eegica, and eegsmooth (in package eegkit)

# example code to create eegdata (not run):
# #(1)# download and untar SMNI_CMI_TRAIN.tar.gz file from UCI:
#   # http://archive.ics.uci.edu/ml/machine-learning-databases/eeg-ml/
# #(2)# eegdata=geteegdata(indir="/Users/Nate/Downloads/SMNI_CMI_TRAIN/",nt=5)
```

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`geteegdata`*Create Data Matrix from UCI EEG Database*

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**Description**

Creates a data matrix (observations by variables) from the EEG Database on UCI Machine Learning Repository. Data matrix has 7 variables: subject, group, condition, trial, channel, time, and voltage. See [eegdata](#) and Details for more information.

**Usage**

```
geteegdata(indir, outdir = indir, cond = c("S1", "S2m", "S2n"), nt = NULL,
           filename = "eegdata", filetype = c(".rda", ".csv", ".txt"))
```

**Arguments**

<code>indir</code>	Input directory (containing EEG data source folders).
<code>outdir</code>	Output directory (to save EEG data matrix file).
<code>cond</code>	Condition to read-in: S1=single stimulus, S2m=two matching stimuli, S2n=two non-matching stimuli.
<code>nt</code>	Number of trials to read-in for each subject (default is all trials).
<code>filename</code>	Name for EEG data matrix (default <code>eegdata</code> ).
<code>filetype</code>	Type of file to save (default is R data file <code>.rda</code> ).

**Details**

EEG Database on UCI website contains 64-channel electroencephalography (EEG) data from alcoholic and control subjects participating in a visual event-related potential (ERP) experiment. Subjects were exposed to three experimental conditions: S1 single visual stimulus, S2m two matching visual stimuli, S2n two non-matching visual stimuli. Each subject participated in multiple trials (replications) of each experimental condition. Data were recorded at 256 Hz for 1 second following the presentation of the visual stimulus/stimuli.

**Value**

Creates and saves a data matrix file.

**Author(s)**

Nathaniel E. Helwig <helwig@umn.edu>

## References

- Bache, K. & Lichman, M. (2013). UCI Machine Learning Repository [<http://archive.ics.uci.edu/ml>]. Irvine, CA: University of California, School of Information and Computer Science.
- Begleiter, H. *Neurodynamics Laboratory*. State University of New York Health Center at Brooklyn.
- Ingber, L. (1997). Statistical mechanics of neocortical interactions: Canonical momenta indicators of electroencephalography. *Physical Review E*, 55, 4578-4593.
- Ingber, L. (1998). Statistical mechanics of neocortical interactions: Training and testing canonical momenta indicators of EEG. *Mathematical Computer Modelling*, 27, 33-64.

## Examples

```
##### EXAMPLE 1: UCI TRAIN DATA (not run) #####

# Note: you need to change 'indir' and 'outdir' in Steps 2-4

# #(1)# download and untar SMNI_CMI_TRAIN.tar.gz file from UCI:
# # http://archive.ics.uci.edu/ml/machine-learning-databases/eeg-ml/

##### for Unix/Mac #####

# #(2)# extract condition "S1" and save as .rda
# eegS1=geteegdata(indir="/Users/Nate/Downloads/SMNI_CMI_TRAIN/",
#                  cond="S1", filename="eegtrainS1")

# #(3)# extract condition "S2m" and save as .rda
# eegS2m=geteegdata(indir="/Users/Nate/Downloads/SMNI_CMI_TRAIN/",
#                   cond="S2m", filename="eegtrainS2m")

# #(4)# extract condition "S2n" and save as .rda
# eegS2n=geteegdata(indir="/Users/Nate/Downloads/SMNI_CMI_TRAIN/",
#                   cond="S2n", filename="eegtrainS2n")

# #(5)# combine conditions
# eegdata=rbind(eegS1, eegS2m, eegS2n)

##### for Windows #####

# #(2)# extract condition "S1" and save as .rda
# eegS1=geteegdata(indir="C:/Users/Nate/Downloads/SMNI_CMI_TRAIN/",
#                  cond="S1", filename="eegtrainS1")

# #(3)# extract condition "S2m" and save as .rda
# eegS2m=geteegdata(indir="C:/Users/Nate/Downloads/SMNI_CMI_TRAIN/",
#                   cond="S2m", filename="eegtrainS2m")

# #(4)# extract condition "S2n" and save as .rda
# eegS2n=geteegdata(indir="C:/Users/Nate/Downloads/SMNI_CMI_TRAIN/",
#                   cond="S2n", filename="eegtrainS2n")

# #(5)# combine conditions
# eegdata=rbind(eegS1, eegS2m, eegS2n)
```

```

##### EXAMPLE 2: UCI TEST DATA (not run) #####

# # Note: you need to change 'indir' and 'outdir' in Steps 2 and 3

# #(1)# download and untar SMNI_CMI_TEST.tar.gz file from UCI:
# # # http://archive.ics.uci.edu/ml/machine-learning-databases/eeg-ml/

##### for Unix/Mac #####

# #(2)# extract condition "S1" and save as .rda
# eegS1=geteegdata(indir="/Users/Nate/Downloads/SMNI_CMI_TEST/",
#                  cond="S1",filename="eegtestS1")

# #(3)# extract condition "S2m" and save as .rda
# eegS2m=geteegdata(indir="/Users/Nate/Downloads/SMNI_CMI_TEST/",
#                  cond="S2m",filename="eegtestS2m")

# #(4)# extract condition "S2n" and save as .rda
# eegS2n=geteegdata(indir="/Users/Nate/Downloads/SMNI_CMI_TEST/",
#                  cond="S2n",filename="eegtestS2n")

# #(5)# combine conditions
# eegdata=rbind(eegS1,eegS2m,eegS2n)

##### for Windows #####

# #(2)# extract condition "S1" and save as .rda
# eegS1=geteegdata(indir="C:/Users/Nate/Downloads/SMNI_CMI_TEST/",
#                  cond="S1",filename="eegtestS1")

# #(3)# extract condition "S2m" and save as .rda
# eegS2m=geteegdata(indir="C:/Users/Nate/Downloads/SMNI_CMI_TEST/",
#                  cond="S2m",filename="eegtestS2m")

# #(4)# extract condition "S2n" and save as .rda
# eegS2n=geteegdata(indir="C:/Users/Nate/Downloads/SMNI_CMI_TEST/",
#                  cond="S2n",filename="eegtestS2n")

# #(5)# combine conditions
# eegdata=rbind(eegS1,eegS2m,eegS2n)

##### EXAMPLE 3: UCI FULL DATA (not run) #####

# #(1)# download and untar eeg_full.tar file from UCI:
# # # http://archive.ics.uci.edu/ml/machine-learning-databases/eeg-ml/

##### for Unix/Mac #####

# #(2)# extract condition "S1" and save as .rda
# eegS1=geteegdata(indir="/Users/Nate/Downloads/eeg_full/",

```

```
#           cond="S1", filename="eegfullS1")

# #(3)# extract condition "S2m" and save as .rda
# eegS2m=geteegdata(indir="/Users/Nate/Downloads/eeg_full/",
#                   cond="S2m", filename="eegfullS2m")

# #(4)# extract condition "S2n" and save as .rda
# eegS2n=geteegdata(indir="/Users/Nate/Downloads/eeg_full/",
#                   cond="S2n", filename="eegfullS2n")

# #(5)# combine conditions
# eegdata=rbind(eegS1, eegS2m, eegS2n)

##### for Windows #####

# #(2)# extract all conditions and save as .rda (default use)
# eegS1=geteegdata(indir="C:/Users/Nate/Downloads/eeg_full/",
#                  cond="S1", filename="eegfullS1")

# #(3)# extract condition "S2m" and save as .rda
# eegS2m=geteegdata(indir="C:/Users/Nate/Downloads/eeg_full/",
#                   cond="S2m", filename="eegfullS2m")

# #(4)# extract condition "S2n" and save as .rda
# eegS2n=geteegdata(indir="C:/Users/Nate/Downloads/eeg_full/",
#                   cond="S2n", filename="eegfullS2n")

# #(5)# combine conditions
# eegdata=rbind(eegS1, eegS2m, eegS2n)
```

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