MNE

MEG + EEG ANALYSIS & VISUALIZATION

History - Overview - Resources - Workflow

http://martinos.org/mne

perso.telecom-paristech.fr/~gramfort/mne/brussels2017

MNE software for processing MEG and EEG data, A. Gramfort, M. Luessi, E. Larson, D. Engemann, D. Strohmeier, C. Brodbeck, L. Parkkonen, M. Hämäläinen, Neuroimage, 2014

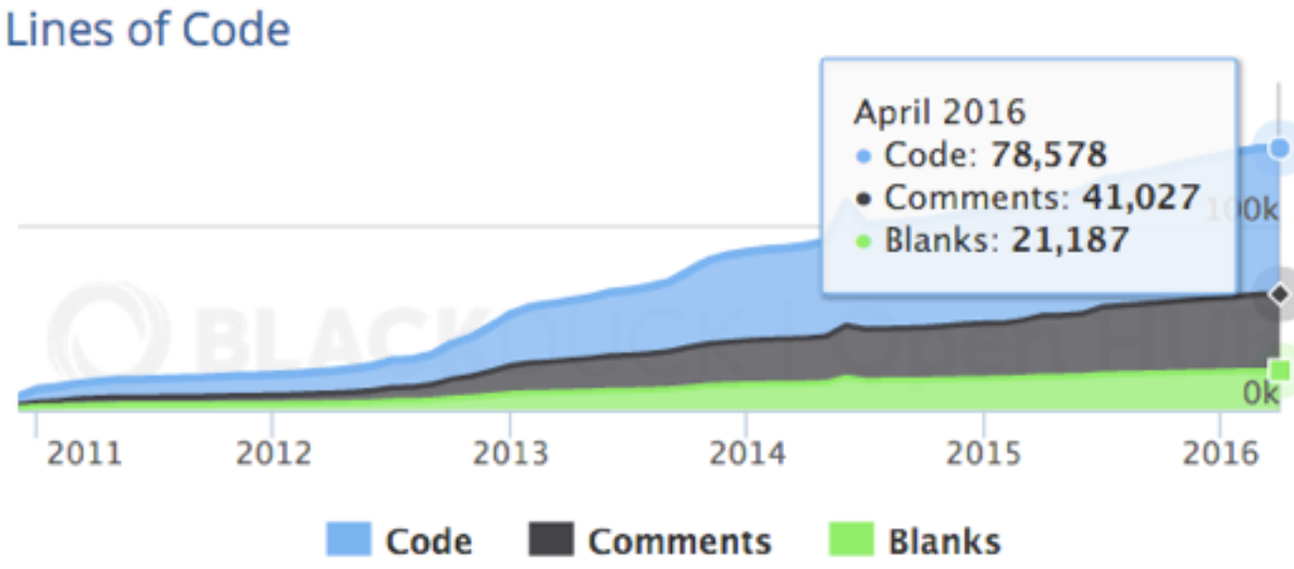
MEG and EEG data analysis with MNE-Python, A. Gramfort, M. Luessi, E. Larson, D. Engemann, D. Strohmeier, C. Brodbeck, R. Goj, M. Jas, T. Brooks, L. Parkkonen, M. Hämäläinen, *Frontiers in Neuroscience, 2013*

What's the plan

- MNE workflow + MNE "jargon"
- Sensor space analysis: Basic preprocessing and visualization
- Forward and inverse modeling
- Decoding / Machine learning

About the project

- MNE based on C code developed for ~15 years by MSH
- MNE-Python started in Dec. 2010 at MGH, Boston



In a Nutshell, MNE-Python...

... has had 11,232 commits made by 114 contributors representing 78,578 lines of code

... is mostly written in Python with a well-commented source code

... has a well established, mature codebase maintained by a very large development team with increasing Y-O-Y commits

... took an estimated 20 years of effort (COCOMO model) starting with its first commit in December, 2010 ending with its most recent commit 3 days ago

12 Month Summary

Apr 3 2015 — Apr 3 2016

3836 Commits

Up + 1358 (54%) from previous 12 months

63 Contributors

Up + 12 (23%) from previous 12 months

Source: https://www.ohloh.net/p/MNE

People

@agramfort

@mluessi

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@dengemann

@joewalter

@OlafHauk

@ jdammers

@christianmbrodbeck

@rgoj

@mainakjas

@t3on

@lauriparkkonen

@TalLinzen

@adykstra

@dgwakeman

@leggitta

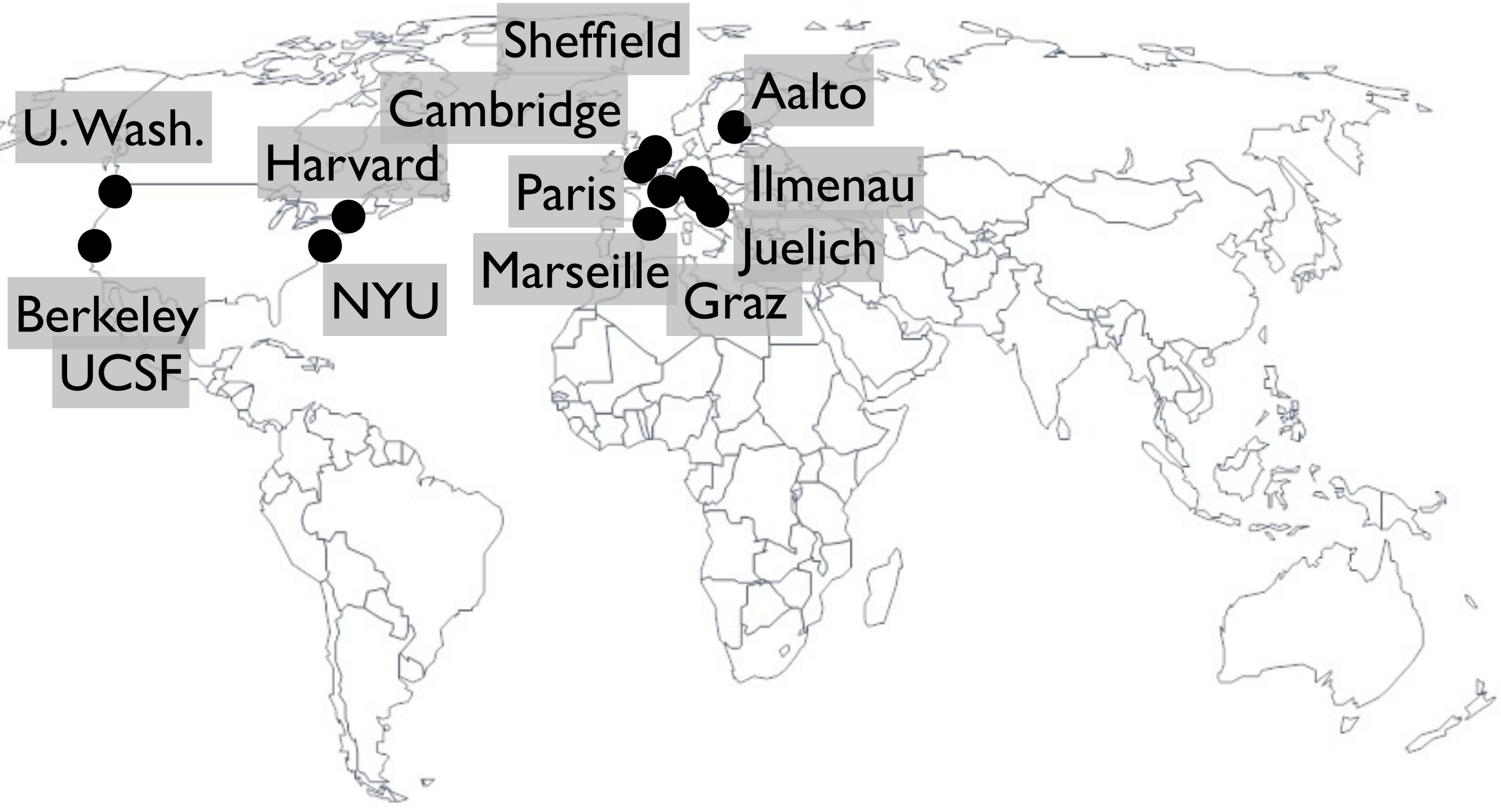
@mshamalainen

@kazemakase

@you?

http://martinos.org/mne/stable/whats_new.html

Development of the MNE software in 2017



mne-tools / mne-python

Unwatch 53 Unstar 281 Fork 252

Code Issues 165 Pull requests 35 Projects 1 Wiki Pulse Graphs Settings

Filters is:pr is:open Labels Milestones New pull request

35 Open ✓ 2,436 Closed Author Labels Milestones Reviews Assignee Sort

[MRG] Remove minor ticks from tfr plot. 1
#4063 opened 22 minutes ago by jaeilepp 0.14

Add on_missing argument to EpochsArray 2
#4062 opened 29 minutes ago by cmmoenne

[MRG] Doc of mne.decoding.Scaler.fit_transform() is not correct 1
#4061 opened 2 hours ago by Akshay0724

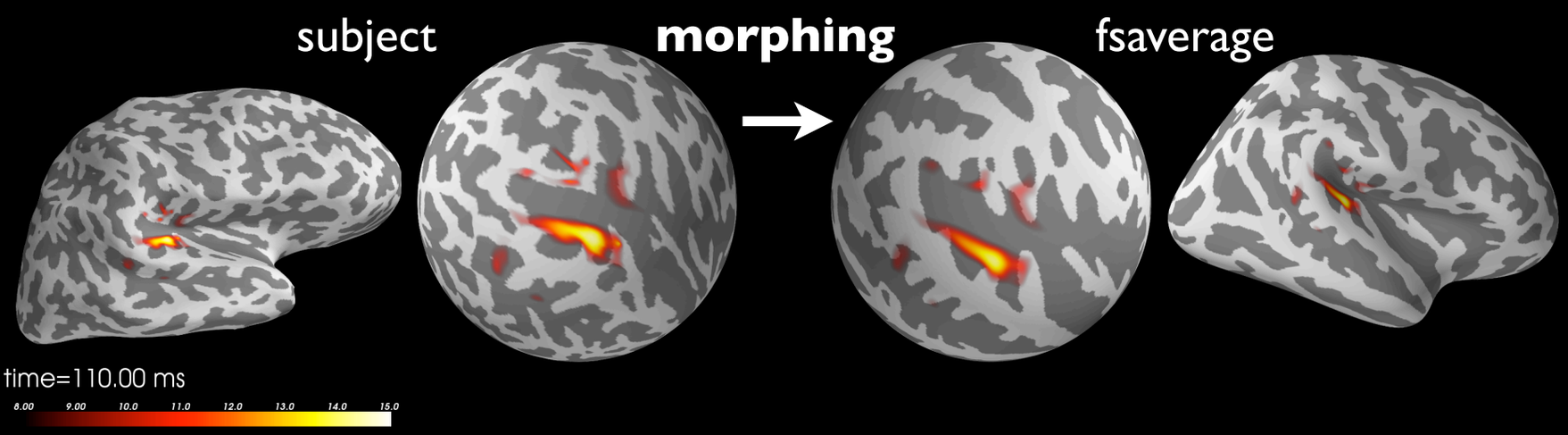
[MRG] Fix interactive topomap projections. 5
#4058 opened 4 hours ago by jaeilepp

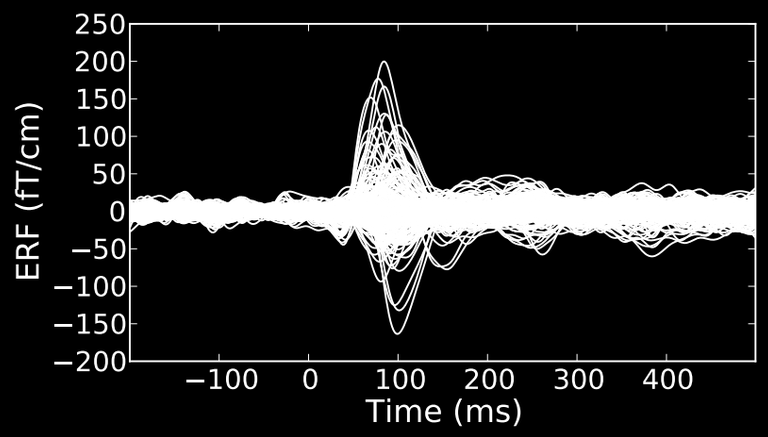
[MRG+1] Fix dipole amplitude + plotter. 10
#4057 opened 6 hours ago by jaeilepp 0.14

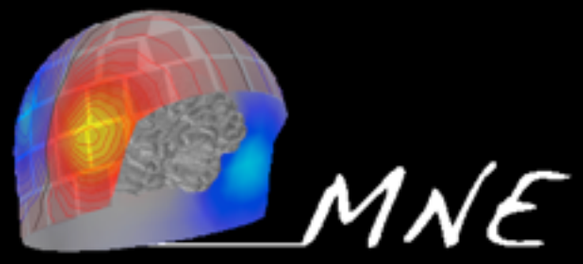
Eeglab matlab7.3 ✕ 1
#4056 opened 9 hours ago by smgutstein

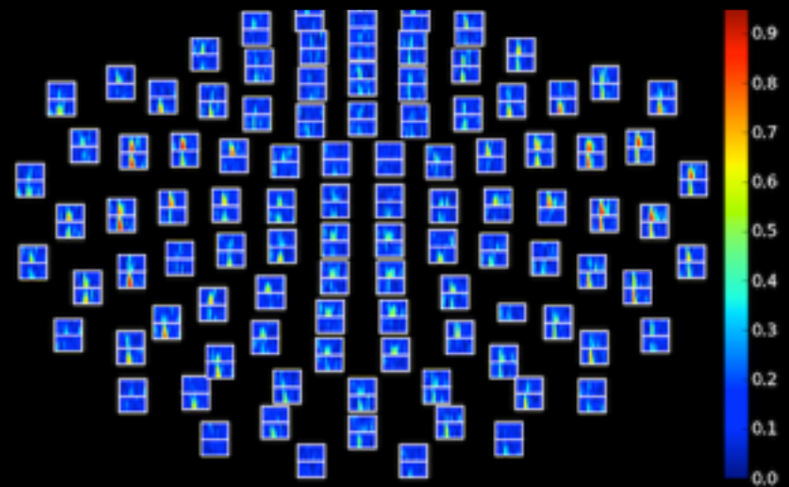
[MRG] Custom solver demo 6
#4043 opened 4 days ago by agramfort

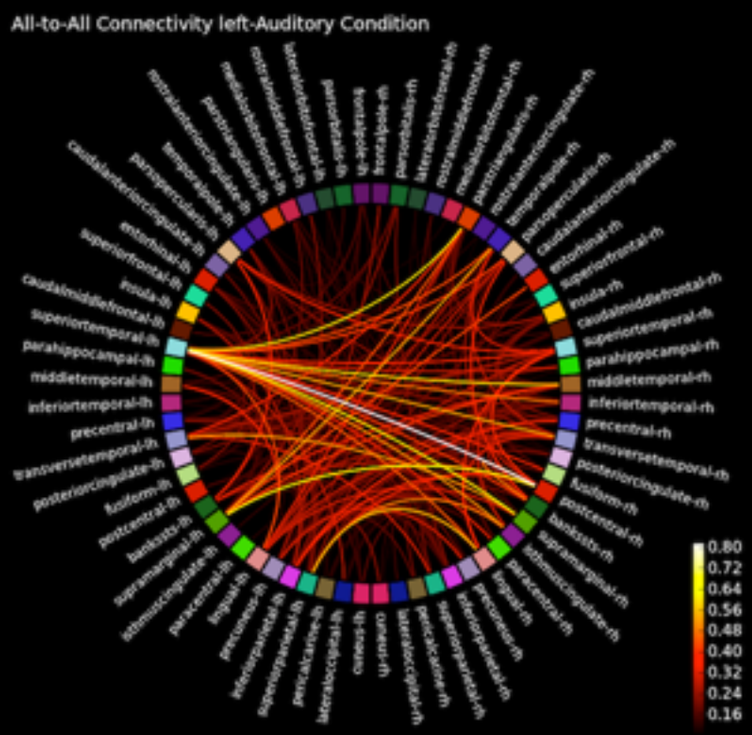
[MRG] add legend to topoplot ✕ 12
#4042 opened 4 days ago by jjnurminen

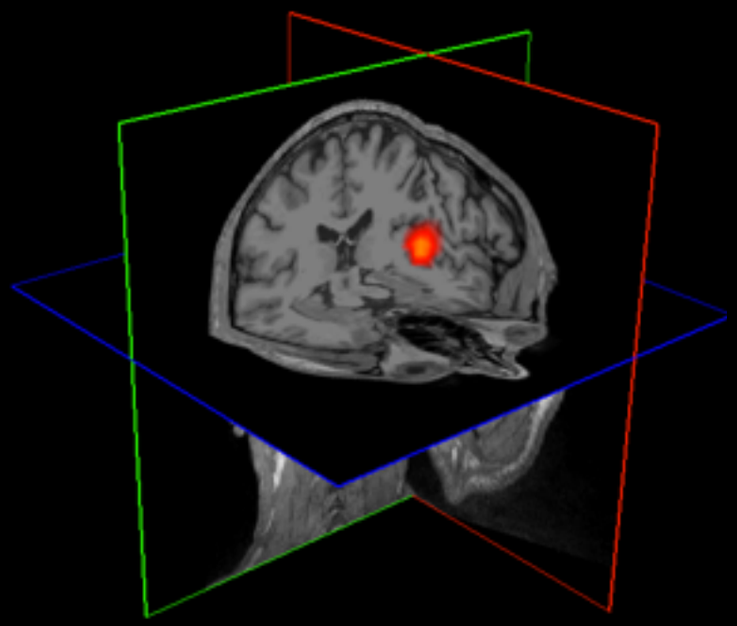

subject
morphing
fsaverage
time=110.00 ms
8.00 9.00 10.0 11.0 12.0 13.0 14.0 15.0

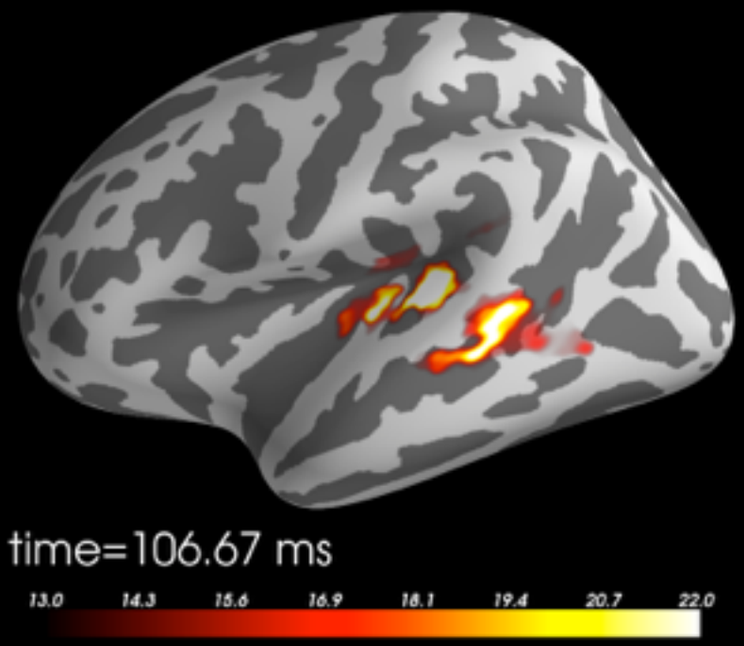

ERF (fT/cm)
Time (ms)


MNE




All-to-All Connectivity left-Auditory Condition

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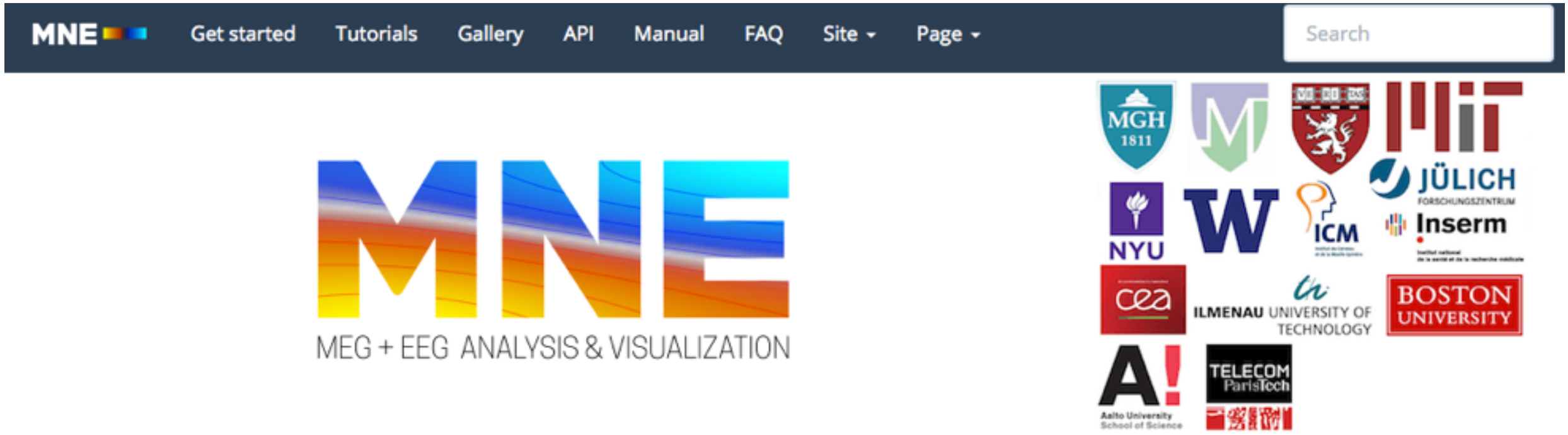
Getting help

http://martinos.org/mne/



Mailing list:

http://mail.nmr.mgh.harvard.edu/mailman/listinfo/mne_analysis

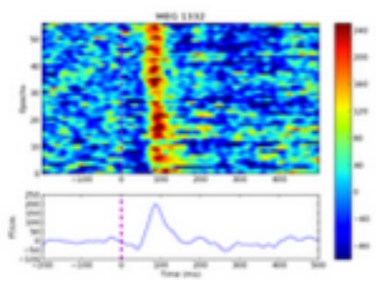
Getting inspired...

http://martinos.org/mne/auto_examples/index.html

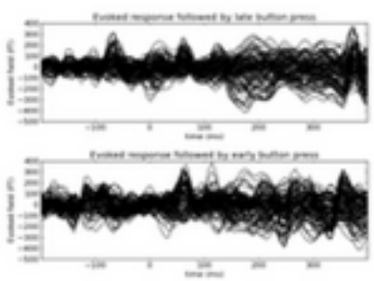
Examples

General examples

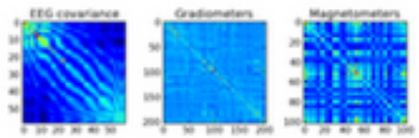
General-purpose and introductory examples to MNE.



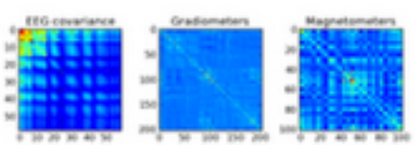
Visualize channel over epochs as an image



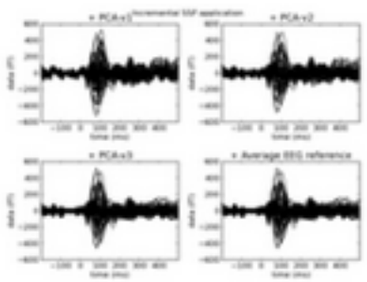
Define target events based on time lag, plot evoked response



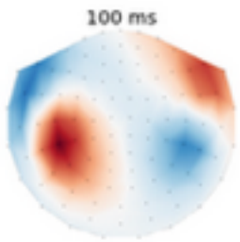
Estimate covariance matrix from Epochs baseline



Estimate covariance matrix from a raw FIF file



Create evoked objects in delayed SSP mode



Plotting topographic maps of evoked data

Table Of Contents

Examples

- General examples
- Connectivity Analysis Examples
- Decoding / MVPA
- Export of MNE data for use in other packages
- Inverse problem and source analysis
- Preprocessing
- Statistics Examples
- Time-Frequency Examples

Previous topic

Tutorial: MEG and EEG data processing with MNE and Python

Next topic

Visualize channel over epochs as an image

Quick search

Sending feedback

https://github.com/mne-tools/mne-python

This repository | Search or type a command | Explore | Gist | Blog | Help | agramfort

mne-tools / mne-python

Unwatch 22 | Unstar 52 | Fork 53

Browse Issues | Milestones | New Issue

Everyone's Issues 30
Assigned to you 0
Created by you 7
Mentioning you 11

No milestone selected

Labels

ENH 11
BUG 0
DOC 0
FIX 0

30 Open | 905 Closed | Sort: Newest

Close | Label | Assignee | Milestone

ENH/FIX: default EEG layout when no headshape ore coil positions are present #926
Opened by dengemann 2 days ago 8 comments

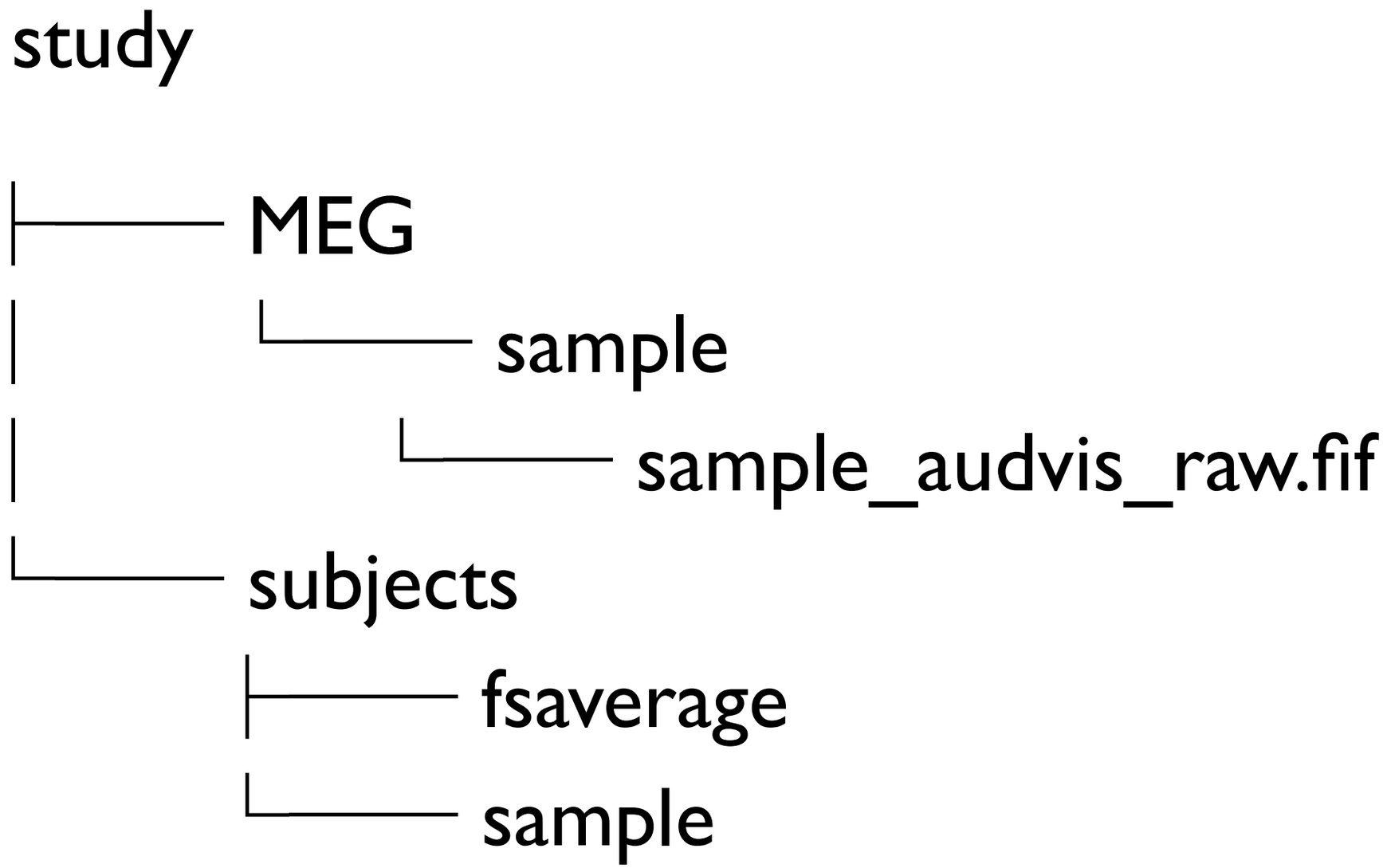
Segmentation fault on unit test #922
Opened by lulopolar 2 days ago 13 comments

BUG: coverage is not working with Travis .... #919
Opened by dengemann 4 days ago

ENH: Improve test coverage #909
Opened by Eric89GXL 7 days ago 11 comments

DOC: setting up Python #900
Opened by christianmbrodbeck 11 days ago 5 comments

Organizing your data



Browsing Raw data

$ mne browse_raw

or

$ mne browse_raw --raw sample_audvis_raw.fif

Remarks:

It is a FIF file

The 3 letters before .fif indicate the content (ave.fif for ERP/ERF, fwd.fif for forward solution, ica.fif for ICA solution, proj.fif for SSPs, etc.)

MNE-Python scripts

$ mne

Usage : mne command options

Accepted commands :

- browse_raw
- bti2fiff
- clean_eog_ecg
- compute_proj_ecg
- compute_proj_eog
- coreg
- flash_bem_model
- kit2fiff
- make_scalp_surfaces
- maxfilter
- report
- surf2bem

Example : mne browse_raw --raw sample_audvis_raw.fif

Getting help example : mne compute_proj_eog -h

Demo SSP for ECG/EOG

```
$ mne compute_proj_ecg -i sample_audvis_raw.fif --l-
freq 1 --h-freq 100 --rej-grad 3000 --rej-mag 4000
--rej-eeg 100 --average -c "MEG 1531" --ecg-h-freq
25 --tstart 5
```

Some links

- Documentation:
  - http://martinos.org/mne/ (general doc)
  - http://martinos.org/mne/stable/manual/index.html (manual)
  - http://martinos.org/mne/stable/tutorials.html (tutorials with code)
  - http://martinos.org/mne/auto_examples/index.html (python examples)
- Code:
  - https://github.com/mne-tools/mne-python (mne-python code)
  - https://github.com/mne-tools/mne-matlab (mne matlab toolbox)
  - https://github.com/mne-tools/mne-scripts (mne shell scripts)