



The EEGLAB News

Issue #1 July 2019



The 29th EEGLAB Workshop was held this June at the Bois Perché holiday camp in the hills of Aspet, France

[View this email in your browser](#)

This is a first issue of a planned quarterly EEGLAB Newsletter. Please send ideas for items in the sections below. To be included in the October #2 issue, please submit these before Sept. 15. - Scott Makeig & Arnaud Delorme, editors; Rachel Weistrop, writer & publisher.

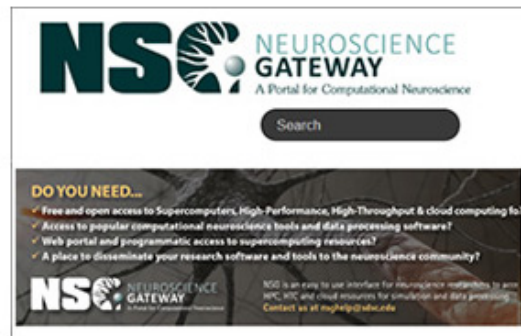
What's New

This section will contain news relevant to important EEGLAB news and new EEGLAB features.

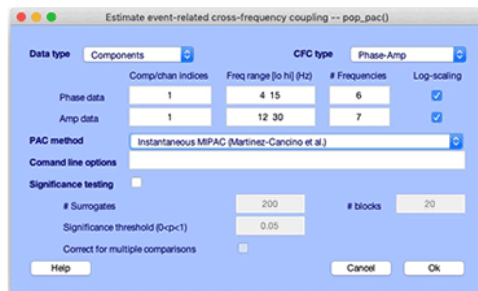
EEGLAB 2019.0 - New EEGLAB version (2019.0) is major update. Enhancements include single-trial measure processing in STUDY processing functions using a new STUDY framework compatible with LIMO (LInear MOdeling; Pernet et al., 2011). STUDY-based measure computations (ERP, ERSP, ITC, mean spectra) have also been reworked to avoid the need to precompute these measures more than once when multiple statistical designs are run on the STUDY data. There is also a new EEGLAB plug-in manager with plug-in rating capabilities; with more than 100 plug-ins now available, this was much needed. See more detail about changes to EEGLAB in this version, including bug fixes and improvements, [on this page](#).

The Open EEGLAB Portal - EEGLAB is now installed in The Neuroscience Gateway portal (nsgportal.org) to the U.S. XSEDE network of high-performance computational (HPC) resources. NSG offers free use of HPC resources to researchers at nonprofit organizations to run neuroscience software (as documented [here](#)) via a website through which EEGLAB jobs can be submitted (documented [here](#)). Most recently, Arno and Ramon have used the NSG (RESTful) API to build EEGLAB functions that allow submitting, monitoring, and retrieving results of NSG jobs *directly from the EEGLAB menu or MATLAB command line*, (as documented [here](#)). Functions to help authors enable EEGLAB plug-ins to offer direct similar access directly will be released soon. Naturally, using batch-mode HPC processing instead of direct, interactive MATLAB computing on your local machine is only worth the effort when the computational demands of your task exceed

available local computer power. We are therefore working to make the most computationally demanding EEGLAB plug-ins (AMICA, NFT/NIST, RELICA, PAC Tools, etc.) available on NSG to make them more widely usable. We welcome any feedback from both first time and veteran users of the Open EEGLAB Portal.



PAC Tools - Interest in phase-amplitude coupling (PAC) has surged lately given

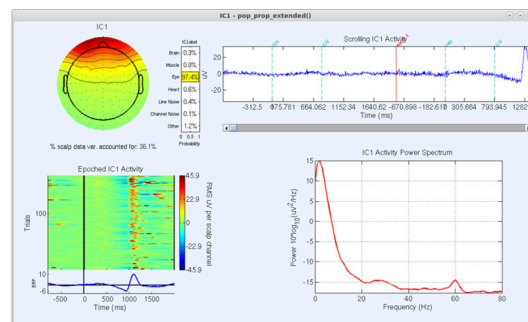


the growing amount of evidence of its potential role in brain information processing and its differences in typical versus pathological conditions. At the time when the PAC Tools project was launched at SCCN, several PAC estimation methods were available but few could evaluate PAC temporal evolution across trials and latencies. To tackle this limitation was the initial motivation for our project. For this, we (Ramon Martinez-Cancino, Scott Makeig and Arnaud Delorme, in collaboration with Roberto Sotero of the University of Calgary) first developed a new PAC estimation approach using local mutual information (reported in a 2019 *NeuroImage* paper [here](#)) that proved able to provide a meaningful temporal description of the evolution of PAC in both simulated and real data. [Read More](#) »

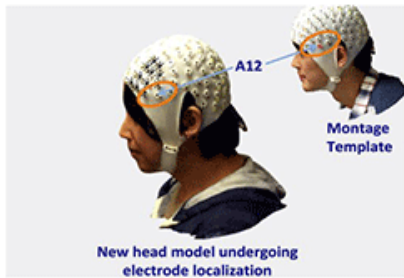
Plug-Ins

Here we will highlight new EEGLAB plug-ins of possible wide interest to EEGLAB users. Please send descriptions of new plug-ins for consideration. These should have a brief lead introduction, and further text and images to be published on a continuation page.

ICLabel - Luca Pion-Tonachini presented the ICLabel plug-in in his successful UCSD dissertation defense in April. The dataset of IC properties for over 100,000 ICs used to train the ICLabel algorithm is in press in *Data in Brief*, and a *NeuroImage* paper on ICLabel performance is in final review. The [ICLabel tutorial website](#) and crowd-sourced labeling pages are in constant use. Luca has created a pipeline to automatically re-train the ICLabel algorithm as the number of crowd-sourced IC labels increases. Over time, this should further increase ICLabel flexibility and reliability.



Get_chanlocs (v2.20) - Recording head fiducial point positions are of use in co-registering heads to MR-based head models -- as well as to other datasets in (soon-to-be supported) 'big EEG data' analyses. Clement Lee has developed a simplified process for locating electrodes in a 3-D head image scan. No longer does the data analyst reading electrode locations from the head scan imaging need to click on the electrode positions in the head surface image in a fixed order -- he/she can do so in any convenient order after a template head image for the scalp montage in use is created (see [the get_chanlocs website](#) and [user guide](#)). [More info](#) »



Profile

This section will contain a personal profile of an EEGLAB developer and/or user, with a description of how they use EEGLAB in their research. For this first issue, Rachel Weistrop, the newsletter editor, has contributed a profile of EEGLAB chief software architect Arnaud Delorme.

Arnaud (aka Arno) Delorme, Ph.D.

Dr. Arnaud Delorme is project scientist and chief software architect of EEGLAB at the Swartz Center for Cognitive Neuroscience (SCCN) at UC San Diego. He recalls the beginning of EEGLAB in 2001, as a postdoctoral fellow in Dr. Terry Sejnowski's lab at The Salk Institute. There, he was confronted with the huge task of analyzing the electroencephalography (EEG) data from his thesis on visual psychophysics. As luck would have it, he found out that fellow lab members, Drs. Scott Makeig and Tzyy-Ping, had developed several functions to analyze EEG data. He was thrilled to be able to utilize these tools, and proceeded to build a graphic interface for the functions. This grew into a team project that is now known as EEGLAB.



How did Dr. Delorme become interested in studying the brain, and in helping to develop a tool that could analyze EEG data in such a powerful way? He says it all started with a thought he had as a 12-year-old boy, sitting in the courtyard of his school in the suburbs of Paris, France... [Read more](#) »

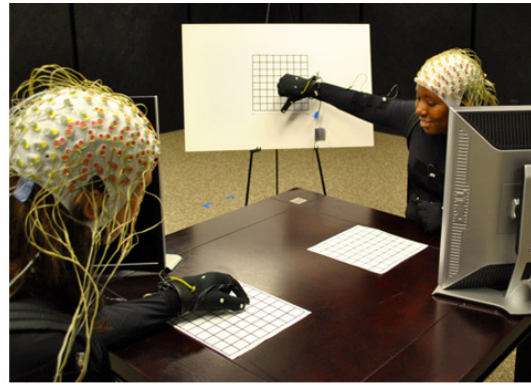
Upcoming Events

This section will contain announcements of future events of possible interest to EEGLAB users. Please submit brief descriptions.

➤ **First Long-format 31st EEGLAB Workshop** - During the period May 27 - June 6, 2020, we are considering hosting a first 11-day EEGLAB Workshop at UCSD. This workshop would feature guest speakers and extensive support for participants working on example as well as their own projects, using either their own or SCCN data. The details of the program are not yet fixed - please send your suggestions to us at eeqlab@sccn.ucsd.edu by October 15. We hope to announce the workshop soon to give potential participants (limited to fewer than 50) time to make arrangements to attend.

➤ **Fourth International MoBI Workshop** - The fourth International Workshop on Mobile Brain/Body Imaging will take place at UCSD from Monday, June 8 (evening) to Friday, June 12 (morning). The third meeting in this series was held in Berlin in summer of 2018. Sessions on technology and analysis, and applications to cognitive neuroscience, biodynamics, education, biofeedback, as well as arts are planned.

➤ **The Hands-on LSL Workshop 2020** - A second Hands-on Workshop on the Lab Streaming Layer software framework will be held at the San Diego Supercomputer Center on the UCSD campus, Sunday, June 7, 2020 preceding the Fourth International MoBI Workshop. Christian Kothe and other developers in the LSL community will give an overview of the LSL project and lead parallel sessions at the introductory, demonstration, and advanced coding (including LSL driver design) levels.



➤ **Lublin, Poland** (October, 2020) - There will be a workshop on using EEGLAB tools at the Catholic University of Lublin, Poland. Tentative dates are October 5-9, 2020.

From the eeglablist

This section will contain brief questions and answers from the eeglablist archives or elsewhere.

Q: Do my dataset independent component (IC) processes account for brain, muscle, eye, line or channel noise, or other activity?

A: Use the [ICLabel tutorial website](#) to learn about and practice classifying ICs. Then download the [ICLabel plug-in](#) to automatically classify your dataset ICs.

In Print

Here we will list recent papers highlighting EEGLAB function and plug-in capabilities. [Please submit suggested papers](#), possibly together with a summary description.

Michel C.M., Baillet S., Benar C., Bertrand O., Gotman J., He B., Huiskamp G-J., Lemieux L., Makeig S., Pascual-Leonee A., Salmelin R., Seri S., Valdes-Sosa P., Wendling F., "[In Memoriam: Fernando Lopes da Silva](#)." *Brain Topography*, 32:519–522. doi.org/10.1007/ s10548-019-00720-0, 2019. *A tribute to the just-departed great in brain and human electrophysiology.*

Delorme, A., Majumdar, A., Sivagnanam, S., Martinez-Cancino, R., Yoshimoto, K., Makeig, S. "[The Open EEGLAB Portal](#)." *9th International IEEE/EMBS Neural Engineering Conference*, San Francisco, March 2019. *A first glimpse at running large EEG analysis on high-performance computing facilities, now open to all nonprofit researchers.*

Pion-Tonachini, L., Kreutz-Delgado, K. and Makeig, S., 2019. [ICLabel: An automated electroencephalographic independent component classifier, dataset, and website](#). *NeuroImage* 198:181-197, 2019. *Now the fastest and most accurate IC classifier.*

Pion-Tonachini L., Kreutz-Delgado K., Makeig S., [The ICLLabel dataset of electroencephalographic \(EEG\) independent component \(IC\) features](#). *Data in Brief*, 25:104101, 2019. *Data used to train the classifier; contribute to it!* <https://labeling.ucsd.edu/tutorial>

Martínez-Cancino R., Heng J., Delorme A., Kreutz-Delgado K., Sotero R.C., Makeig S., [Measuring transient phase-amplitude coupling using local mutual information](#). *NeuroImage*, 185:361-378, 2019. *A new and powerful PAC measure and multi-measure plug-in toolbox.*

Hsu SH, Pion-Tonachini L, Palmer J, Miyakoshi M, Makeig S, Jung T-P, [Modeling brain dynamic state changes with adaptive mixture independent component analysis](#). *NeuroImage*, 183, pp.47-61, 2018. *Multi-model AMICA decomposition spots brain state transitions!*

Artoni F, Delorme A, Makeig S. [Applying dimension reduction to EEG data by Principal Component Analysis reduces the quality of its subsequent Independent Component decomposition](#). *NeuroImage* 175:176-187, 2018. *For ICA decomposition, reduce dimensionality as needed by removing channels, not principal components -- else, collect more data! See also: Artoni RELICA paper.*

Online

Here we will embed YouTube or other tutorial videos available online. [Please send suggested links and brief text summaries.](#)



EEGLAB WORKSHOP SAN DIEGO 2016

SOURCE LOCALIZATION: THE EEG FORWARD AND INVERSE PROBLEM

Zeynep Akalin Acar

This lecture was given at the EEGLAB Workshop at UCSD in 2016, by Dr. Zeynep Akalin Acar

Copyright © 2019 Swartz Center for Computational Neuroscience, University of California, San Diego, 10100 Hopkins Dr., La Jolla, CA. All rights reserved.
This newsletter was designed by Scott Makeig, Arno Delorme, and Rachel Weistrop.

This email was sent to <<Email Address>>

[why did I get this?](#) [unsubscribe from this list](#) [update subscription preferences](#)
Institute for Neural Computation · 9500 Gilman Dr · La Jolla, CA 92093-5004 · USA

