

# New EEG tools and measures

Track B (Vizlab) - New EEG tools and measures (John Iversen)

2:30 - 3:00 -- D3.B1: Group-level Connectivity (Makoto Miyakoshi)

3:00 - 3:30 -- D3.B2: Automated source classification and real time ICA (Luca Pion-Tonachini)

3:30 - 4:00 -- D3.B3: Phase/amplitude coupling (PAC) with PACT (Ramon Martinez-Cancino)

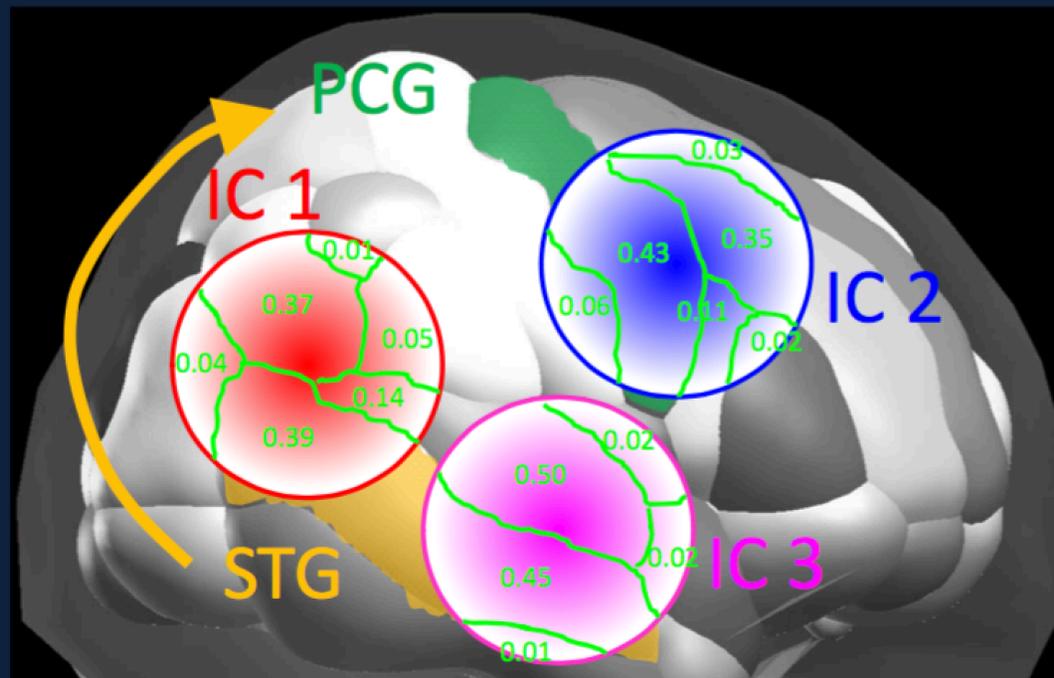
4:00 - 4:15 PM -- Coffee break

4:15 - 5:00 -- D3.B4: New technologies and methods to enable large-scale EEG data analysis (HED, ESS) (Nima Bigdely-Shamlo)

5:00 - 5:30 -- D3.B5: MEG and simultaneous EEG/MEG analysis (John Iversen)

# Makoto — Group level connectivity

## Pairwise dipole density connectivity



$$\begin{aligned} \text{InfoFlow}(\text{STG} \rightarrow \text{PCG}) &== \\ \text{InfoFlow}(\text{IC1} \rightarrow \text{IC2}) & * (0.39 * 0.43) / \underline{(0.39 * 0.43 + 0.45 * 0.43)} + \dots \\ \text{InfoFlow}(\text{IC3} \rightarrow \text{IC2}) & * (0.45 * 0.43) / \underline{(0.39 * 0.43 + 0.45 * 0.43)} \end{aligned}$$

Normalization term for dipole pair density.

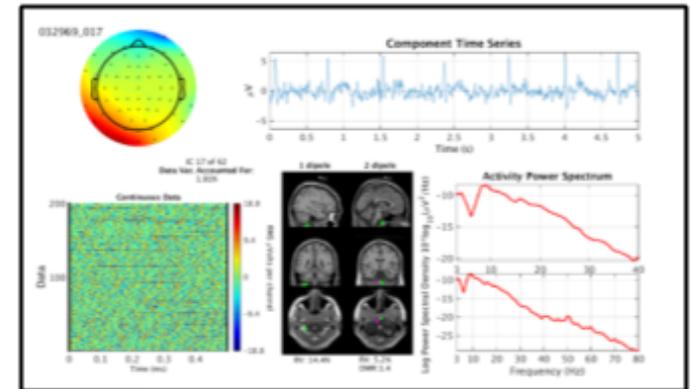
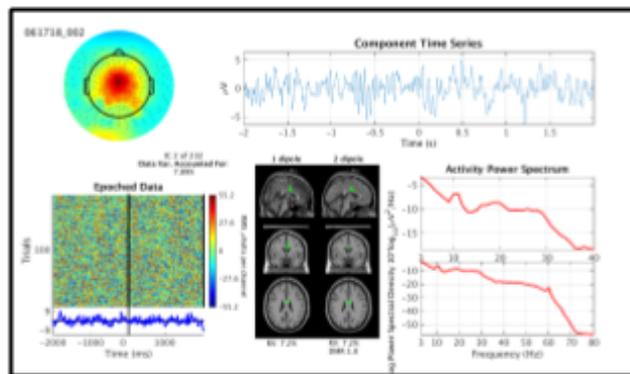
Calculate this for all  $76 \times 76 = 5776$  edges.

# Luca & Sean

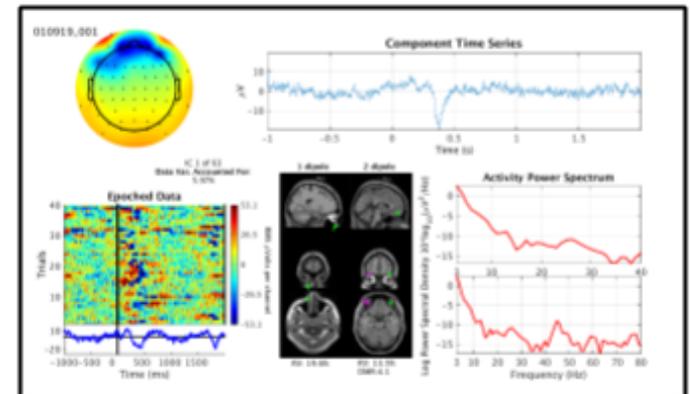
## Automatic Source Classification & Real-time ICA

What is it?

Determining the general origin of an EEG component's activity in an automated fashion.



Heart

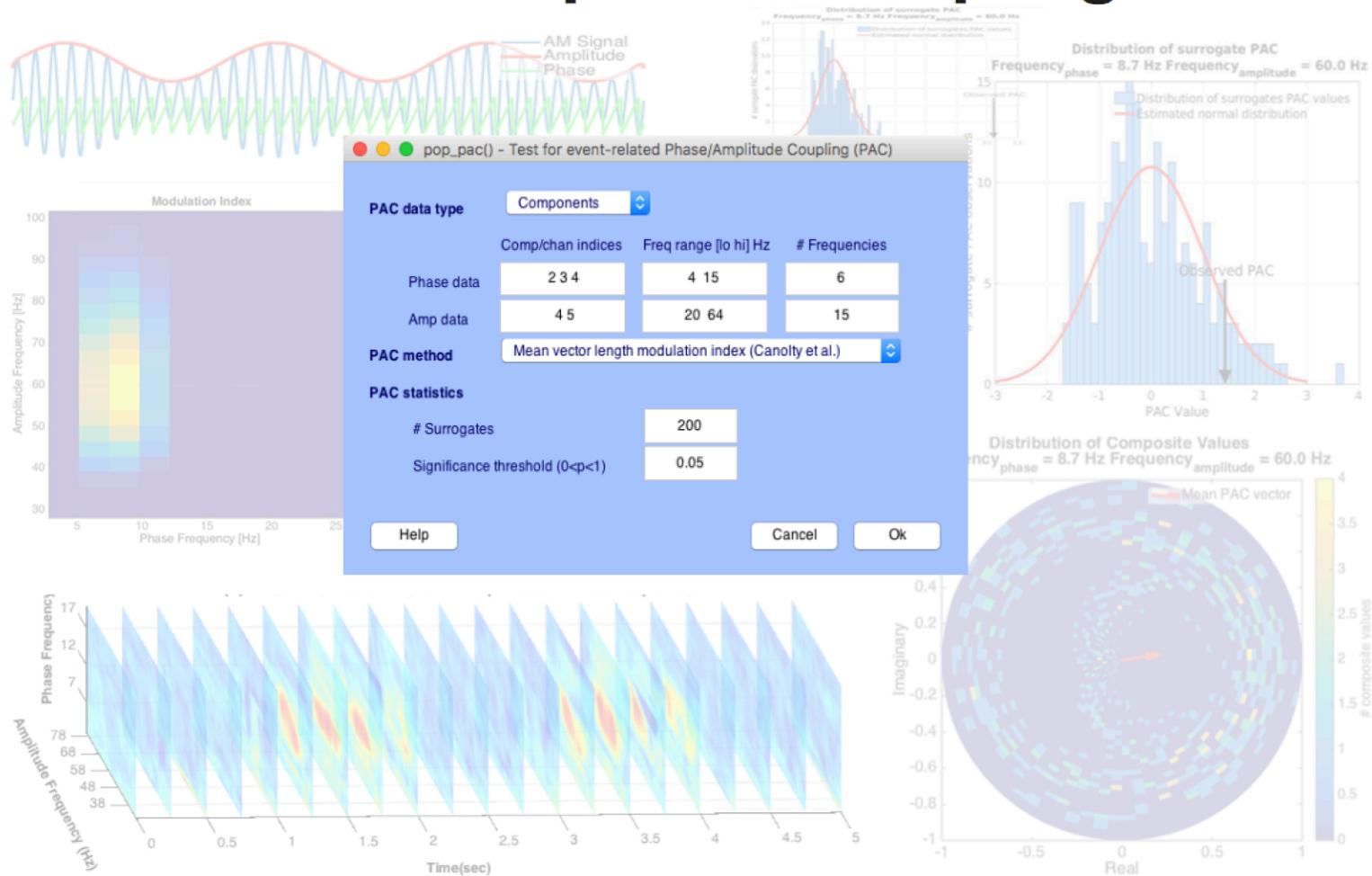


Brain

Eye

# Ramón & Joseph – PACT plugin

## EEGLAB plug-in: Phase Amplitude Coupling

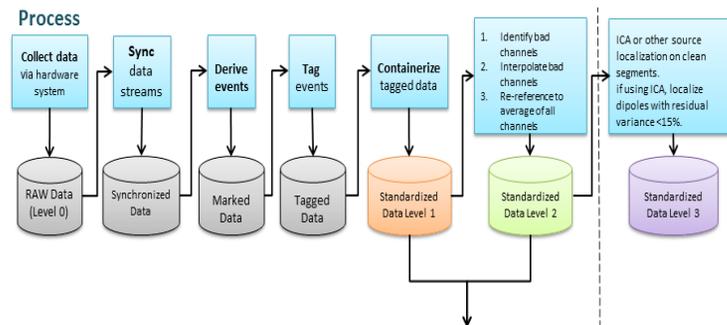
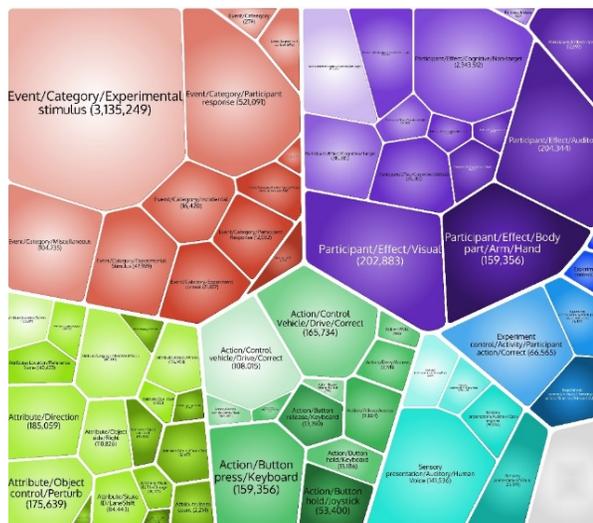
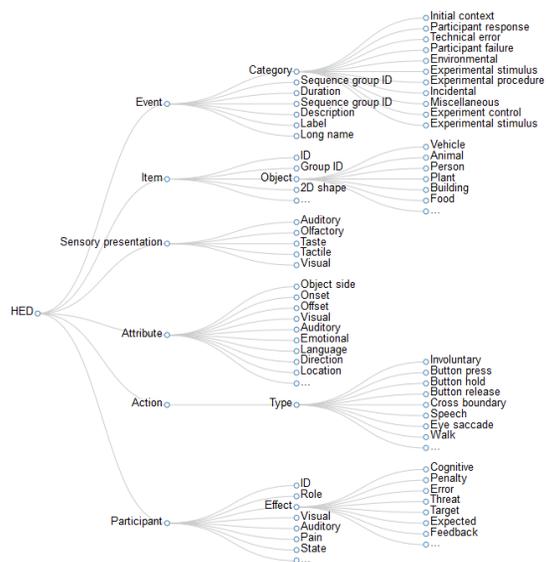


## New technologies and methods to enable large-scale EEG data analysis

This presentation will cover two enabling neuroinformatics technologies, Hierarchical Event Descriptors (HED) and EEG Study Schema (ESS), for automated large-scale EEG analysis. HEDTools EEGLAB plugin for event tagging and epoching will also be introduced.

Nima Bigdely Shamlo (Qusp), Kay Robbins (UTSA)

# HED



# John – MEEG Analysis in EEGLAB

