EEGLAB Bad Electrode Detection

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1 Joint Probability

1.1 Wrapper Function

Algorithm 1 pop_jointprob: wrapper function to apply joint probability detection for EEGLAB function across the dataset.

Input: $INEEG \in \mathbb{R}^{C \times N \times T}$ input EEG data, C = number of channels, N = number of timepoints, T = number of trials. **NOTE:** the EEGLAB EEG object has other metadata objects attached to it

Input: $icacomp \in [1|0]$, which type of data to run on: 1 = electrode data, 0 = ICA component activations. 1 is default

Input: $elecrange \in \mathbb{R}^{j \leq C}$, which electrodes to inspect for rejections

Input: $locthresh \in \mathbb{R}$, threshold for single electrode inspection

Input: $globthresh \in \mathbb{R}$, threshold for all electrode detection

Input: *superpose* and *reject*, other extra variables in EEGLAB that aren't relevant to the algo

Output: $OUTEEG \in \mathbb{R}^{C \times N \times T}$ output EEG data, C = number of channels, N = number of timepoints, T = number of trials. The **metadata has been updated, not the actual data**.

procedure POP_JOINTPROB($INEEG$, $icacomp$, $elecrange$, $locthresh$, $globthresh$)
  if $icacomp == 0$ **then** ▷ If running on ICA components
    Prompt running ICA on $INEEG$ if not run yet
  if $icacomp == 1$ **then**
    $tmpdata = strip\_metadata(INEEG)$
    if $empty(INEEG.jpE)$ **then** ▷ If joint prob hasn't been done before
      $INEEG.jpE, rejE = jointprob(tmpdata, locthresh, EEG.stats.jpE)$ ▷
  return $OUTEEG$