9 July 2021

Questions Asked

Is a 32 channel EEG system considered high density?

* No, it seems the number of electrodes corresponds to whether it is high density or not. With 124 and 268 systems… this would not be high density… 32 channels is definitely not considered high-density. The average system is going to be at least 64 channels for anything that isn't in use in specialized populations or designed for people to wear while they move (as in mobile EEG systems). High density is usually 128+ channel systems.

How do you address overfitting and underfitting of the data? (being: what if there are more sources than channels or more channels than sources, respectively)

-I am not sure how that is possible if the input matches the output in ICA…

Some advice from friends and the internet:  If you want to relate ICs to actual physiological/cognitive components, then there is indeed reason to wonder if you should exclude some of the ICs that EEGLAB automatically gives you; on the other hand, if you just want to use the ICs to quantify different parts of the waveform (e.g., to isolate and remove EOG artifact) then overfitting is not necessarily a problem.

Why do we use hot and cold heat maps if we are concerned with the absolute value (magnitude disregarding directionality)?

* It is not just the absolute value as the measure is a reference to whatever the baseline is… so it is the directionality in regard to the baseline. But what is “real” in terms of the group or individual…. we cannot be certain (like with fMRI). If you mean from the plain ICA components… then that is as useful as your question makes it in regard to thee purpose for only plotting and analyzing the ICA components.

What units are heat maps in? Is it consistently microvolts or just for that figure?

-I guess this would depend on the time scale, your question, analysis goals… but microvolts as well as millivolts are typical…. As you increase the scale your “wavy bois” will shrink.

Can you reverse directions and retain the same meaning of the data (e.g., is an N1/P1 complex the same as a P1/N1 complex?)

* I would think not… if we are considering them as holding some “negative” or positive meaning that appear under specific conditions… I thought of “complex” as being the pattern with which they appear… not the division of the two?

-As wel… You can't flip flop the directionality of the ERP's and have them be the same thing. Both the valence (Positive/Negative) and timing come from decades of literature that find specifically these components under whatever corresponding task conditions. Though one thing that might seem confusing (maybe the source of this question?) is that oftentimes ERP's will be plotted with y-axis flipped, so a negative component is plotted in the "up" direction instead of "down." Don't know why, it's just one of those quirks of the field!

* Diagram

  Description automatically generated with medium confidence

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5831095/