Dr. Voytek:

I have some clarification questions on the paper and a request regarding payment while working with the lab.  
  
1. What are the next steps?

Ideas:

1. To measure effect of aperiodic parameters on algorithmic burst detection performance.

We talked about using human selections as a putative ground truth; however, I don’t think that plan is supported by selections on EEG sigs. The red mark denotes signals where using intersection % with human selection as ground truth would reject accurate burst detections by the YOLO model. Blue denotes an interval where human selections were substantively more accurate than YOLO, and purple denotes a tie.A screenshot of a computer screen

AI-generated content may be incorrect.



I think measuring the effect of the aperiodic signal on burst labeling requires us to define bursts consistently. Karav, et. al writes that “Neural oscillations […] are increasingly interpreted as transient bursts rather than as sustained oscillations [and are] correlated with memory, movement and perception, and were even suggested as the primary ingredient of all beta-band activity.” Perhaps we could define them as intervals with the power to predict certain measures of cognitive function, or we could define and label them in terms of their shapes.

I think we need some equivalence that defines bursting/non-bursting intervals to solve that problem. Anything that lets us answer the question, “was this labeler correct?”

1. The hyperparameter problem in burst detection and parametrization: to introduce a model that doesn’t require researchers to tune DSP-related hyperparameters to detect oscillations because the requirement introduces researcher subjectivity and bias.
2. YOLO dataset improvement. If the goal of the paper were to define a dataset optimization procedure using a signal simulation toolkit for training supervised learning algorithms for burst detection, I think that could work. The YOLO model was trained on a very simple dataset.
3. Improving/substituting the YOLO model with a similar model to load data samples as 1d time series.
4. Improving bycycle/dualthresh hyperparams in the analysis I presented on Tuesday.
5. Move from computer vision to transformers or something else.

2. Payroll request: Can you pay me hourly/W2 payroll for work I do after we get payroll set up this year? Otherwise, I have to pay a 15% self-employment tax on top of income tax but I don’t consider myself self-employed.