EEG recordings enquiry

The values in the columns for the EEG signals represent either power spectrum density (units = Watts/hz) or coherence (unitless) for various different locations on the head. The column headers starting with "AB" represent power spectrum density, and the column headers starting with "COH" represent coherence. Power spectrum density is a measure of the EEG signal's power distribution in the frequency domain, and coherence is a measure of synchronization between signals from two different electrodes based on phase consistency. Both frequency and phase consistency are derived from time series data, so that's why there is no raw time series data here - that information is basically already included in the values we see.

You'll notice that there are way more columns for coherence than there are for power spectrum density. This is because power spectrum density is calculated only once per electrode per frequency band. (So with 19 electrodes, 19*6 frequency bands = 114 power spectrum density columns.) But since coherence is measured between *every* pair of electrodes for each frequency band, you have *(n(n-1)/2) = (19(19-1)/2) = 171* coherence values for each of the 6 frequency bands, totaling *171 * 6 = 1026* columns with values representing coherence.

Also do a search for "EEG 10-20 montage" to see the electrode layout being used for this data set. (I'd link, but my account isn't old enough.) The electrodes are what the "F3", "O2", "Fp1", et al. labels in the column headers correspond to. Notice that odd numbers are on the left side of the head, and even numbers are on the right side of the head. The F, P, T, and O in the electrode names stand for frontal, parietal, temporal, and occipital for each lobe of the brain. Each power spectrum density value is associated with a single electrode, and thus one specific point on the head. However, since coherence is a measure of difference, it takes two electrodes to calculate it - so you can't assign coherence to a singular location. It's kind of analogous to voltage, where the value represents a difference between two locations.

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