Poster

271. Data Analysis and Statistics: Human Data II

Location: Halls B-H

Time: Sunday, November 13, 2016, 1:00 PM - 5:00 PM

Program#/Poster#: 271.03/LLL17

Topic: I.07. Data Analysis and Statistics

Support: Sloan Research Fellowship

Title: Neural oscillatory power is not Gaussian distributed across time

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Abstract: Neural oscillations are important in organizing activity across the human brain in healthy cognition, while oscillatory disruptions are linked to numerous disease states. Oscillations are known to vary by frequency and amplitude across time and between different brain regions; however, this variability has never been well characterized. We examined human and animal EEG, LFP, MEG, and ECoG data from over 100 subjects to analyze the distribution of power and frequency across time, space and species. We report that between data types, subjects, frequencies, electrodes, and time, an inverse power law, or negative exponential distribution, is present in all recordings. This is contrary to, and not compatible with, the Gaussian noise assumption made in many digital signal processing techniques. The statistical assumptions underlying common algorithms for power spectral estimation, such as Welch's method, are being violated resulting in non-trivial misestimates of oscillatory power. Different statistical approaches are warranted.

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271. Data Analysis and Statistics: Human Data II

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