**Titolo (provvisorio):** Investigating the impact of volume conduction on functional EEG/MEG connectivity metrics.

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**Motivazione e campo di applicazione**

The mixing of activity from different brain sources in EEG/MEG data is known to lead to spurious detections of functional brain connectivity. While solutions to this problem are available for linear connectivity metrics, it is unclear whether this is also the case for non-linear metrics such as phase-amplitude coupling (PAC) and amplitude-amplitude coupling (AAC).

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**Obiettivi generali e principali attività**

Using simulations, this project will compare the performance of candidate approaches involving either orthogonalization or surrogate data. The simulations should be written in Python using the MNE toolbox and should be integrated in a larger benchmarking framework. The theoretical properties of these methods should also be analyzed.

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**Obiettivi di apprendimento (strumenti tecnici e analitici, metodologie sperimentali)**

The successful candidate will learn advanced signal processing techniques as well as the most advanced machine learning algorithms available in the context of neuroscience. By learning python programming, the candidate will also have the opportunity to master one of the most successful and highly requested programming languages.

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**Luogo/i in cui si svolgerà il lavoro:** Charité Universitätsmedizin Berlin, Germany

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**Informazioni aggiuntive**

**Numero massimo di studenti:** 1

**Supporto finanziario/borse di studio:** Erasmus +