Removing Artifacts from EEG Measurments Triggerd by Transcranial Magnetic Stimulation (Yeda)
code: T4-1800
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Summary

A new software tool used for the removal of artifacts from transcranial magnetic stimulation (TMS) triggered electroencephalography (EEG) was developed by the group of Prof. Moses.The combined use of TMS with EEG allows for a unique measurement of the brain's global response to localized and abrupt stimulations. This may allow TMS-EEG to be used as a diagnostic tool for various neurologic and psychiatric conditions. However, large electric artifacts are induced in the EEG by the TMS, which are unrelated to brain activity and obscure crucial stages of the brain's response. These artifacts are orders of magnitude larger than the physiological brain activity, and persist from a few to hundreds of milliseconds. However, no generally accepted algorithm is available that can remove the artifacts without unintentionally and significally altering physiological information.The software designed according to the model along with a friendly GUI is a powerful tool for the TMS-EEG field. The software has tested and proven to be effective on real datasets measured on psychiatric patients.

Applications

TMS triggered EEG diagnostics

Advantages

Easy to use software with a GUI
Exposes the full EEG from the brain

echnology's Essence

he new software tool is based on the observation that, contrary to expectation, the decay of the electrode oltage after the TMS pulse is a power law in time rather than an exponential. A model based on two mensional diffusion of the accumulated charge from the high electric fields of the TMS in the skin was built. his model reproduces the artifact precisely, including the many perplexing artifact shapes that are seen on he different electrodes. Artifact removal software based on this model exposes the full EEG from the brain, as alidated by continuously reconstructing 50Hz signals that are the same magnitude as the brain signals.

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