Abstract

To understand ‘Working of Human Brain’, measurements related to the brain function are required. These measurements should be possibly non-invasive. Brain should be disturbed as less as possible during the measurement. Integration of various modalities plays a vital role in understanding the cognitive and the behavioral changes in the human brain. It is an important source of converging evidence about specific aspects of neural functions and dysfunctions under certain pathological conditions. Focal changes in cortical blood flow are tightly coupled with the changes in neuronal activity. This constitutes the option to map the hemodynamic response and infer principles of the cortical processing, even of complex tasks. The very high temporal resolution of EEG and good spatial resolution by NIRS make this concurrent measurement unique to study the spatio-temporal dynamics of large scale neuronal networks in the human brain. Such integration of two techniques will help to overcome the limitations of a specific method. Such as insensitivity of electroencephalogram (EEG) to unsynchronized neural events or lack of near infrared spectroscopy (NIRS) to low metabolic demand. A combination of EEG and NIRS will be more informative than the two separate analyses in both modalities.
Human Brain Mapping based on COLD Signal Hemodynamic Response and Electrical Neuroimaging

References

- R. Labounek, M. Lamoš, R. Mare?ek, J. Jan, "Analysis of Connections between..."

- Siamac Fazli, Jan Mehnert, Jens Steinbrink, Gabriel Curio, Arno Villringer, Klaus-Robert Muller, Benjamin Blankertz, Enhanced Performance By A Hybrid NIRS–EEG Brain Computer Interface; NeuroImage 59 (2012) 519–529
- Elizabeth M. C. Hillman, Optical Brain Imaging In Vivo: Techniques And Applications From Animal To Man; Journal of Biomedical Optics 12_5_, 051402 _September/October 2007
- J. Daunizeau, H. Laufs & K. Friston; EEG-fMRI Information Fusion: Biophysics And Data Analysis; Institute of Neurology, UCL
- Dean Cvetkovic, Elif Derya Übeyli, Irena Cosic, Wavelet Transform Feature

**Index Terms**

Computer Science

Signal Processing

**Keywords**

EEG  NIRS  Brain Mapping  Imaging  ICA  SVM  Spectral Analysis