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Clinical EEG-neuroimaging, EEG-biomarkers and neurofeedback

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It is well known that pathologies affect certain brain regions with either increased or decreased brain wave activity. For example, typical depression has an increased activation in the insula according to fMRI studies. A technology called QEEG has shown over the years that EEG can also be used for neuroimaging, showing topographically regions in the brain with either excessive or insufficient activity. But many times those changes in brain wave activity are very subtle and so invisible for the naked eye. Another problem is how to quantify activity as normal on the one hand and deviant at the other hand. With the use of databases it is possible to quantify those subtle changes and show significantly altered brain activity which are correlated to symptoms. Newer EEG-Neuroimaging Techniques like sLORETA can look into deeper brain structures like Brodman Areas and parts of the limbic system. The technology is called standardized low-resolution brain electromagnetic tomography (sLORETA) which incorporates a mathematical inverse solution of surface EEG data to provide cortical source localization, and generating three-dimensional images, similar to those produced by fMRI data. The deviations shown in Z-Scores can have correlations in structural, emotional and neurocognitive changes in the brain, which give new understanding in the underlying mechanisms of psychiatric disorders following a brain damage. But where there is a problem we can also see the solution. Working with those EEG-Biomarkers, can also guide the Neurofeedback clinician in the treatment by altering these patterns via operant conditioning targetting regions that show the most deviation correlated with the symptoms of the client.

Biography

Thomas F Feiner has more than 25 years' experience as Occupational Therapist and Neuro-therapist. He conducted and participated in clinical research on QEEG and evoked potentials and Neurofeedback since 2006. He developed computer software for testing the auditory order threshold on regular Windows PCs and created an easy to use stimulus presentation program for research in the field of evoked potentials and other psychophysiological measures. He is the Clinical Director of the Center for Neurofeedback in Munich and established the Institute for EEG-Neurofeedback in 2008 which offers professional education programs in the field of Neurofeedback, Quantitative EEG and evoked potentials. Since 2017, he conducted research on the EEG of meditators in great study of more than 1000 subjects. He is Founder and Owner of Neurofeedback-Partner GmbH. His focus is on research and development of integrated neurofeedback protocols, event related potentials in combination with low level brain stimulation technologies.

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