

Taking imaging into the therapeutic domain: Self-regulation of brain systems for mental disorders



Context

Through the development of fMRI-based neurofeedback techniques over the last decade, it is now possible to train patients in the self-regulation of the disordered networks with the aim of obtaining clinical benefits: improve diagnosis, restore function, alleviate symptoms and promote resilience.

Real-time functional magnetic resonance imaging (fMRI) uses magnetic resonance imaging to measure brain activity, by detecting associated changes in blood flow which increases with neuronal activation.

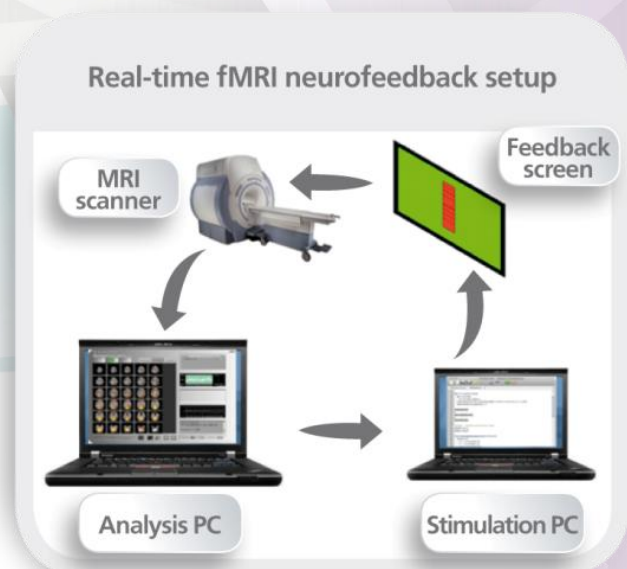
fMRI can be used for on-line-monitoring of brain function as well as for selfmodulation of neural processes via interactive training. With the **neurofeedback** procedure, patients learn control over brain activity using real-time signals from their own brain.

Objectives

BRAINTRAIN will improve and adapt the methods of real-time fMRI neurofeedback (fMRI-NF) for clinical use, including the combination with electroencephalography (EEG) and the development of standardized procedures for the mapping of brain networks that can be targeted with neurofeedback.

Its core component will be the exploration of the efficacy of fMRI-NF in selected mental and neurodevelopmental disorders that involve motivational, emotional and social neural systems. The ultimate goals of **BRAINTRAIN** are therefore to:

- Develop new or optimize existing imaging technologies
- Validate their application as a therapeutic tool for mental and behavioural disorders by integrating imaging data with complementary knowledge from bioinformatics and clinical data,
- Facilitate the diagnosis of mental disorders at the pre-symptomatic stage or early during development
- Better measure disease progression,
- Develop transfer technologies for fMRI-NF through EEG and serious games.



BRAINTRAIN is innovative in the development of new real-time imaging technologies including new sequences, image reconstruction methods and data analysis software. This will also be the first clinical testing of fMRI-NF in a set of disorders with extraordinary socioeconomic and public health impact.

BRAINTRAIN is a four year European project which started in November 2013 and is coordinated by Cardiff University (Wales, UK) and is divided into 6 workpackages (WP):



Our consortium brings together 10 complementary partners, including 7 academic research institutions, one SME, one industrial partner and a technology transfer/management company. The partners are based in six countries (United Kingdom, France, Germany, Israel, Portugal and the Netherlands).

Contacts

Scientific Coordinator
Professor David Linden
 Institute of Psychological Medicine
 and Clinical Neurosciences
 School of Medicine, Cardiff University
 Hadyn Ellis Bldg, Maindy Road
 Cardiff CF24 4HQ United Kingdom
 E-mail: LindenD@cardiff.ac.uk

Project Manager
Delphine Smaghe
 Inserm Transfert
 7 Rue Watt
 75013 Paris
 France
 E-mail: delphine.smaghe@inserm-transfert.fr

For more information, please visit our web site
www.braintrainproject.eu

