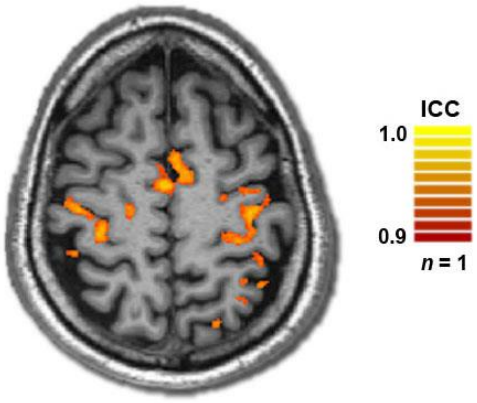
HRSS fMRI

Improving reliability of functional magnetic resonance imaging

Invention

Functional magnetic resonance imaging (fMRI) is an important research tool, but is increasingly applied in medical diagnostics. An advantage of the method lies in the high-resolution display of cognition. A disadvantage of the method is the low reliability caused in particular by noise in the fMRI signal and it can make fMRI problematic for medical diagnostics. Recent fMRI methods also are based on algorithms that have been developed for group analysis and therefore they are also very susceptible to noise in the fMRI signal.

The above restrictions can be significantly reduced by high-resolution single-subject (HRSS) fMRI. HRSS fMRI requires at least two fMRI scans, which must differ in the spatial and / or temporal resolution level. By HRSS fMRI, a record is generated after data aquisition which has a significantly higher reliability and resolution than the supplied fMRI scans. The algorithm is fast and efficient, so the analysis can be completed on a commercial workstation within a very short time. HRSS fMRI is optimized for brain activity analysis of the individual patient. The result is a high-resolution, compared to the conventional methods, significantly reduced noise and thus a clinically valuable fMRI data set.



As a method for postprocessing HRSS fMRI does not require additional equipment. An integration into commercial software for medical diagnostics and therapy planning is possible without any problems. By using at least two fMRI scans and one centered on the patient algorithm artifacts can be largely excluded, so that the result of the fMRI measurements is suitable for medical diagnosis and therapy plannin.

Commercial application

The applicability of fMRI in medical diagnostics and treatment planning can be significantly improved by HRSS fMRI. By significantly increased reliability in the fMRI signal with high performance in the clinical setting, the method is also for the diagnosis of neurological and psychiatric diseases such as the navigable surgical planning in neurosurgery. An involvement in medical software for diagnosis and treatment planning is possible without any problems.

Current status

A German patent application at the DPMA as well as an PCT application has been filed. On behalf of the RWTH Aachen and the Karl-Franzens-University of Graz we offer the opportunity of licensing and further development of the technology to interested companies.

An invention of the RWTH Aachen and the Karl-Franzens-University of Graz

Advantages

- **Significant improvement in clinical applicability of MRI**
- **No additional equipment**
- **High performance in clinical practice**
- **Application for diagnosis and planning navigation**

CONTACT:
Ref.No.: 2014_04
Michael Freidl

University of Graz
Research Management
Universitaetsplatz 3
8010 Graz
Phone: +43 316 380 3994
E-Mail: michael.freidl@uni-graz.at
Web: www.uni-graz.at
www.inventionstore.de

Contact:
Ref.-No.: 3950
Andreas Brennemann, Dipl.-Ing.

PROvendis GmbH
Schloßstr. 11 - 15
D-45468 Mülheim an der Ruhr
Germany
Phone: +49 (0)208 94 105 33
Fax: +49 (0)208 94 105 50
E-Mail: ab@provendis.info
Web: www.provendis.info