

EU Braintrain Standardization Workshop



Venue and date

Tuesday, 27th September 2016
Max-Planck-Institute for Human Cognitive and Brain Sciences
Stephanstrasse 1a
04103 Leipzig
Germany

Organizing Committee

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Background

Braintrain (<http://www.braintrainproject.eu/>) is a European research network that aims to develop and optimize methods for real-time fMRI neurofeedback and validate its application as a therapeutic tool for mental and behavioral disorders. Braintrain aims to make the novel real-time fMRI neurofeedback methods available to a larger community of researchers, since it is currently still limited to a relatively small number of research labs.

Currently, real-time fMRI neurofeedback cannot be readily performed on standard clinical scanners, but requires in depth technical knowledge of the operators. A general issue is the lack of reliable, fast, easy-to-use and standardized access to the acquired data. So far, most research groups have developed their own or modified approaches to data access.

The workshop aims at making this step easier in the future. We believe that a standardized interface and open image reconstruction systems available across all platforms could make the method more widely available and pave the way for clinical trials. Thus, we would like to discuss the needs of neurofeedback and the consequent technical requirements of such an interface.

Format and Approach

The 1-day workshop will bring together developers of real-time analysis software, experts in real-time image reconstruction and representatives of scanner manufacturers. To enable efficient exchange and interaction, the workshop format is based on a small group of presenters and attendees (< 25), and shorter talks will be complemented by focused discussions.

In order to facilitate the standardization discussion, the workshop will review the current status and anticipate future developments in the field. The presentations and panel discussions will develop further the standardization goal by discussing data formats, scanner interfacing and bi-directional communication between the MRI scanner and external hardware.

Initial Proposal

As a starting point for discussions, the organizers suggest the following approach for standardization of data formats and interfaces:

- Export of image data via TCP/IP in the NifTI format (<http://nifti.nimh.nih.gov/>)
- Export of raw data in the ISMRMRD format (<http://ismrmrd.github.io/>)
- Import of externally reconstructed images back into the scanner's image database
- Bi-directional communication between external hardware and MRI scanner. This would allow e.g. starting and stopping scans or changing scanning parameters in real time.
- Real-time control and mechanisms to ensure real-time operation (e.g. time stamping)

This proposal does not intend to limit the discussion but rather facilitate it. The workshop aims to jointly develop this proposal further and ideally result in a concrete action plan and data export specifications.

If you have questions, comments or ideas you would like to share (before the workshop), please do not hesitate to contact the organizers (main contact: svolz@cbs.mpg.de). We would be delighted to discuss them.

We are looking forward to welcoming you at the MPI-CBS in Leipzig soon!

Rainer Goebel, Nikolaus Weiskopf, Steffen Volz

Workshop Programme

08h30 – 08h45 Welcome

08h45 - 10h30 Talks and discussion on image reconstruction

10h30 - 10h45 Panel discussion

10h45 - 11h15 Coffee Break

11h15 - 12h45 Talks and discussion on real-time fMRI analysis

12h45 - 13h00 Panel discussion

13h00 - 14h00 Lunch Break

14h00 - 15h30 Talks and discussion on specific scanner hardware

15h30 - 15h45 Panel discussion

15h45 - 16h15 Coffee Break

16h15 - 17h15 General discussion

17h15 – 17h30 Closing

After 17h30 Possibility for a tour through MPI-CBS facilities.

Confirmed speakers

Michael Hansen

National Heart, Lung, and Blood Institute, National Institutes of Health, Bethesda, Maryland, USA.

Martin Uecker

Institute for Diagnostic and Interventional Radiology, University Medical Center Göttingen, Göttingen, Germany.

Rainer Goebel

Department of Cognitive Neuroscience, Faculty of Psychology and Neuroscience, Maastricht University, The Netherlands

Robert W. Cox

Scientific and Statistical Computing Core, National Institute of Mental Health, National Institutes of Health, Department of Health and Human Services, USA

Scott Hinks (GE)

Chief Scientist at GE Healthcare