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Distributed collaboration: the case for the enhancement of Brainspell's interface

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MEETING ABSTRACTS

Open Access

2015 Brainhack Proceedings



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Introduction to the 2015 Brainhack Proceedings

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Brainhack — a novel conference model for the open neuroscience research community [1] — exploded in 2015. With three-day events in Honolulu (June), Montréal (July), and across the Americas (eight participating sites in October) [<http://events.brainhack.org/>], a community that first began only a few years ago around the shared spirit of collaboration and an ethos of open science has taken resolute form.

As Brainhack events were founded on the principle that content should emerge through the onsite interaction of participants, the innovative event structure demanded a different publication form. Inverting the model of conference proceedings, where submissions are triaged in preparation for the meeting, we developed the Brainhack Proceedings to rather mark the achievements, outputs, and ideas that emerged as the meeting's result.

Post-conference papers were solicited from participants at any of the events held in 2015. All submissions were peer-reviewed in the Brainhack Proceedings Github repository [<https://github.com/Brainhack-Proceedings-2015>] using an innovative open-review process. In keeping with the culture of Brainhack, we took advantage of the open platform provided by Github [<http://github.com>] to encourage a productive dialogue between authors and reviewers.

This first issue of Brainhack Proceedings includes 23 project papers — presenting an overview of the broad range of interests, content, and achievements that converged at Brainhack events this past year. With at least four international events scheduled for 2016 [<http://events.brainhack.org>], we hope that this publication format will provide an ongoing record of the growth within our community. Snapshots of all the projects and supporting information can be found in the *GigaScience*, GigaDB, repository [2].

For more information visit the Brainhack home page [<http://brainhack.org>].

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A1

Distributed collaboration: the case for the enhancement of Brainspell's interface

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Introduction

The past several decades have seen an explosive growth in the number of published neuroimaging studies. In concert, the demand for freely available and openly accessible 'study data', that would facilitate future reanalysis, meta-analysis, hypothesis testing and repurposing has also soared. Here we report on developments made to Brainspell[1] one of several web-based initiatives (e.g. BrainMap[2], NeuroVault[3], Neurosynth[4]) that allow individuals to search through and organize massive numbers of neuroimaging studies and results in meaningful ways.

Distinct from other databases, Brainspell [<http://brainspell.org>] is the first web-based initiative to allow users to manually annotate and curate machine-parsed data, as well as manually extend the database via its crowdsourcing user interface. The goal of our Brainhack project was to improve Brainspell's interface. We worked to (a) provide supplementary manual data edit options (b) facilitate efficient manual database extension, and (c) aid meaningful organization of data.

Approach

We used GitHub to manage the client and server code, and to coordinate its development.

Results

Supplementary manual data edit options

In the original version of Brainspell, users were able to edit experiment (table) title, caption and coordinates for each article. We added four supplementary options. In particular, users are now provided with enhanced 'edit feedback':

- Feedback indicating when a field is editable or has been successfully saved. Editable text fields now turn light grey, while a successfully stored field loses its coloring. Storage of fields can now be triggered by a tab key or by clicking elsewhere, in addition to hitting return.

Users are also provided with additional edit options, specifically, the ability to:

- Add symbols to the title and caption fields.
- Remove empty tables.
- Add and remove rows from a table.

Database extension

While users were previously able to add new articles and their coordinate tables, the process was labor- and time-intensive, since each value had to be manually entered. We implemented a more efficient method to edit tables:

- Addition of an *Import* link to each table. When clicked it opens a popup window where comma-separated text can be entered and parsed.

Meaningful organization of data

Potential shortcomings of neuroimaging databases employing automatic coordinate data extraction is their inability to segregate (i) multiple contrasts (e.g. within group, inter-group), and (ii) significant versus nonsignificant coordinates, when present in a single table. The following options were added to facilitate non-ambiguous data organization (see Fig. 1):

- Addition of a *Split* link to each table.
- Fine-tuning the *Split* link enhancement to allow more than ten splits.
- Option to add articles lacking PMID (or user-specific articles).
- Addition of a *Download* link to each article. When clicked it downloads article title, reference, abstract, and tables.
- Creation of 'article collection' functionality. Users can now store the results of their search into article collections. Clicking on an existing collection brings back the corresponding articles and re-computes the 3D volume and mesh of the aggregated locations. Users can create and edit multiple collections.

Conclusion

We performed ten enhancements to Brainspell and provided instructions of use in Brainspell's wiki. We tested these enhancements on Safari, Firefox and Chrome. Moreover, 25 articles were manually added to Brainspell as part of our extended beta testing phase. Our goal with these enhancements was to extend the functionality, and ease of use of Brainspell for curating machine-parsed neuroimaging data from a wide database of studies.

During January 15 to February 5, 2016 alone, Brainspell was used in 282 sessions by 133 users who watched 1421 pages. Moreover, Brainspell was forked to "BIDS-collaborative/Brainspell" which itself was forked by approximately 10 data-science students to extend the platform.

Availability of supporting data

More information about this project can be found at: <http://github.com/r03ert0/brainspell-brainhack>.

Competing interests

None.

Author's contributions

RT developed Brainspell. AB, DK, and JBP suggested enhancements and performed beta testing. AB and RT wrote the report.

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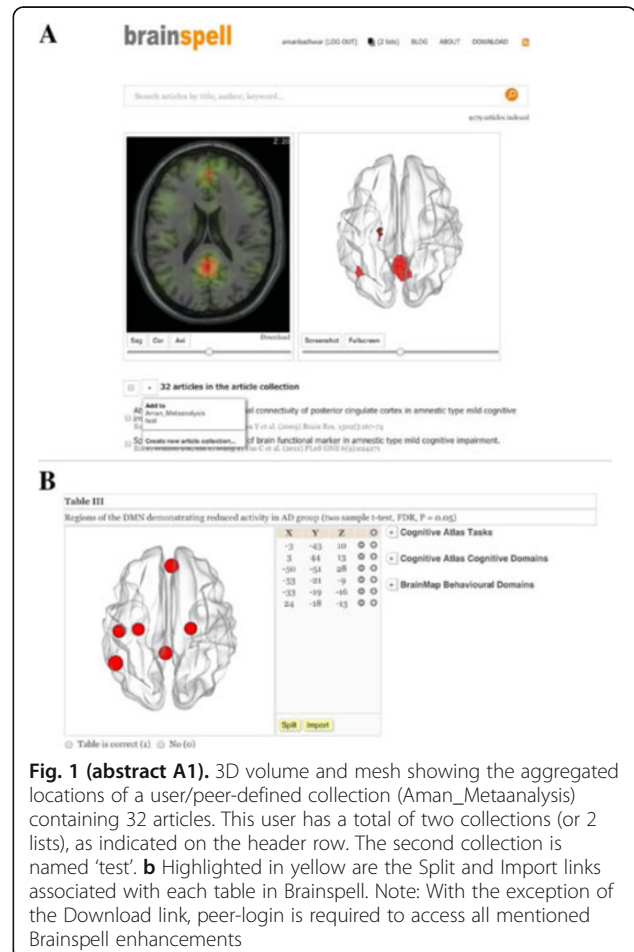


Fig. 1 (abstract A1). 3D volume and mesh showing the aggregated locations of a user/peer-defined collection (Aman_Metaanalysis) containing 32 articles. This user has a total of two collections (or 2 lists), as indicated on the header row. The second collection is named 'test'. **b** Highlighted in yellow are the Split and Import links associated with each table in Brainspell. Note: With the exception of the Download link, peer-login is required to access all mentioned Brainspell enhancements

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Advancing open science through NiData

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Introduction

The goal of this project is to improve accessibility of open datasets by curating them. "NiData" aims to provide a common interface for documentation, downloads, and examples to all open neuroimaging datasets, making data usable for experts and non-experts alike.

Approach

Open datasets promise to allow more thorough analysis of hard-to-collect data and re-analysis using state-of-the-art analysis methods. However, open datasets are not truly open unless they are easy to find, simple to access, and have sufficient documentation for use. Currently, publicly available data in neuroscience are scattered across a number of websites and databases, without a common data format, no common method for data access, and varying levels of documentation. Datasets are being uploaded to public databases through a number of initiatives, including OpenfMRI [1] and NITRC [2]. In addition, there are funded efforts for collecting data explicitly for the