# Viewing FSL results with SPM and vice versa

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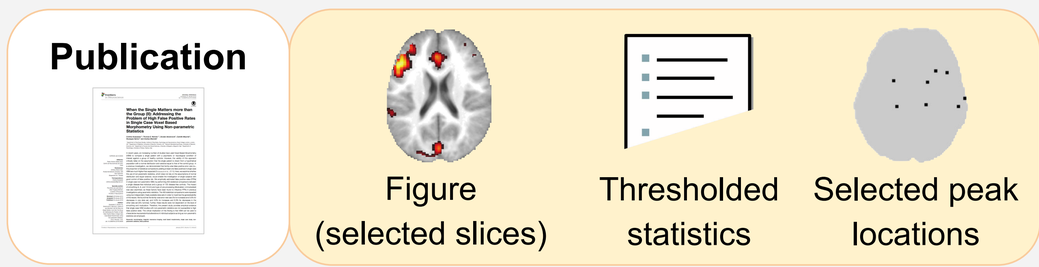
## Introduction

A growing number of efforts are emerging in the neuroimaging community to **increase reproducibility of research findings** (e.g. [1,2]). In an attempt to facilitate publishing of neuroimaging data and metadata, the NeuroImaging Data Model (NIDM) defines a set of specifications based on semantic web technologies.

The **NIDM-Results** specification was recently introduced, providing a **machine-readable representation of mass univariate statistical results**, including extensive metadata and key images summarising the findings [3].

**NIDM-Results packs can be generated from SPM [5] and FSL [6]**. However few tools exist to read and display NIDM-Results.

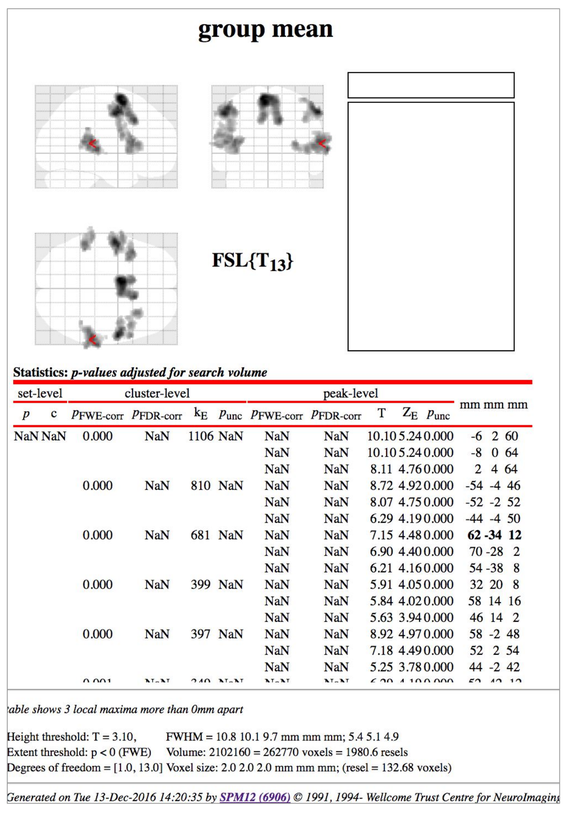
Here, **we introduce two NIDM-Results viewers**, one each oriented for users accustomed to SPM and FSL, two of the most widely-used neuroimaging analysis softwares [7].

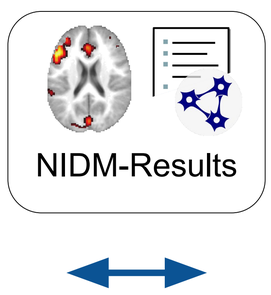



## Results

SPM -style view

FSL -style view



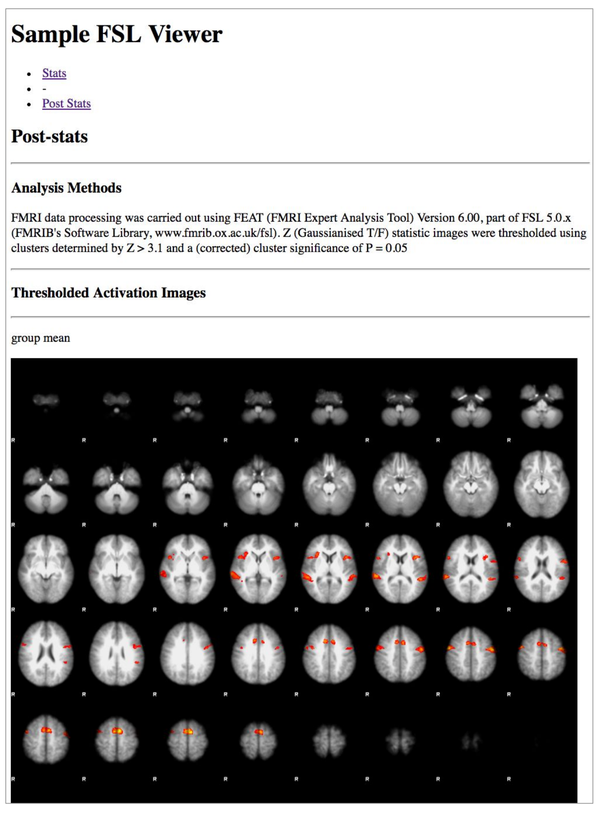




**Fig. 1.** Viewing the results of the same group fMRI study with SPM and FSL. The corresponding NIDM-Results pack is available at: http://neurovault.org/collections/1692/fsl_group_ols.nidm.

## Installation

1. Download SPM-style viewer from https://github.com/incf-nidash/nidmresults-spmhtml
2. Update the Matlab path

```
addpath(PATH_TO/spm12)
addpath(PATH_TO/nidmresults-spmhtml)
```

1. Install the FSL-style viewer using pip

```
pip install
git+git://github.com/incf-nidash/nidmresults-fs
lhtml.git
```

## Usage

View a NIDM-Results pack with:

```
nidm_results_display('fsl_group_ols.nidm.zip')
```

```
nidmviewerfsl fsl_group_ols.nidm.zip
```

## Useful links

SPM-style viewer: https://github.com/incf-nidash/nidmresults-spmhtml, FSL-style viewer: https://github.com/incf-nidash/nidmresults-fslhtml,

NIDM-Results specification: http://nidm.nidash.org/specs/nidm-results.html.

Getting started with NIDM: http://nidm.nidash.org/getting-started/.

## Conclusion

We hope that the viewer will facilitate the adoption of the NIDM-Result format for sharing of statistical results in the neuroimaging community as well as interoperability across software packages. This work is part of a growing ecosystem of tools for NIDM and it is our intention to develop more applications to further to increase the practical utility of NIDM-Results. Other projects also include the creation tools for meta-analysis of neuroimaging data.

## References

[1] Gorgolewski, Front Neuroinform. 2015
[2] Poldrack Front Neuroinform. 2013
[3] Maumet Scientific Data. 2016
[4] http://www.equator-network.org
[5] Penny Academic press. 2011
[6] Jenkinson Neuroimage. 2012
[7] Carp Neuroimage. 2012
[8] https://rdflib.readthedocs.io/
[9] http://neurovault.org/collections/1692/
[10] Pauli et al. Front Neuroinform. 2016

## Acknowledgments

We acknowledge the work of all INCF task force members as well as the Wellcome Trust for support of CM and TEN.