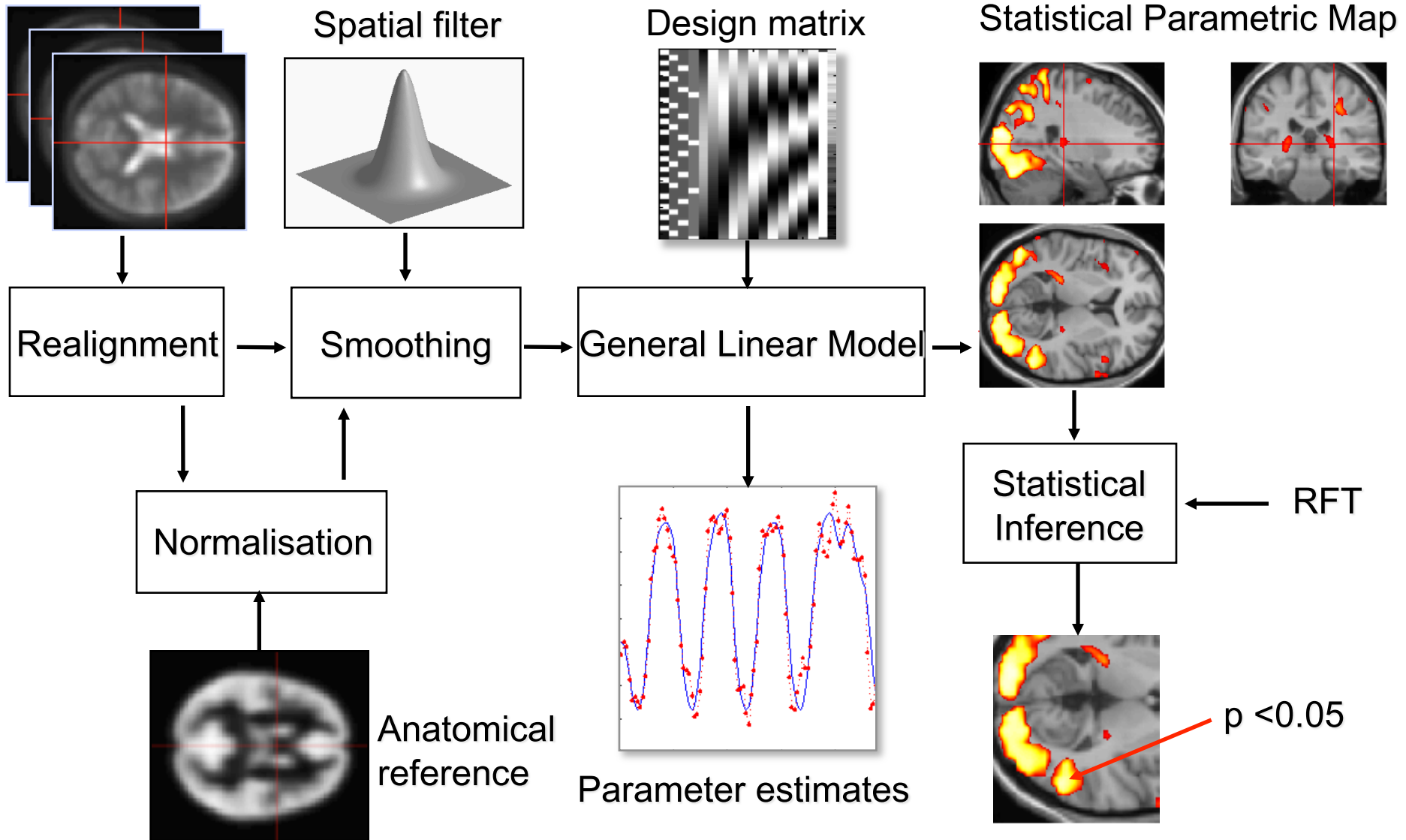


# SPM Software & Resources

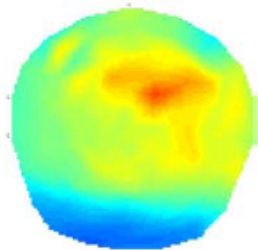
Wellcome Trust Centre for Neuroimaging  
University College London

**SPM Course**  
**London, May 2010**

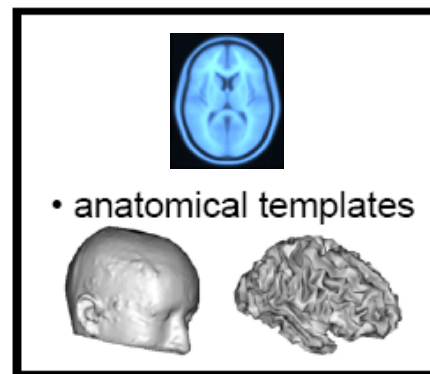
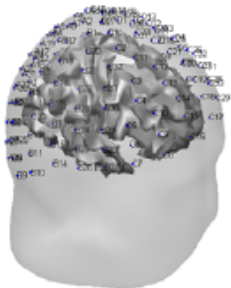
# Image time-series



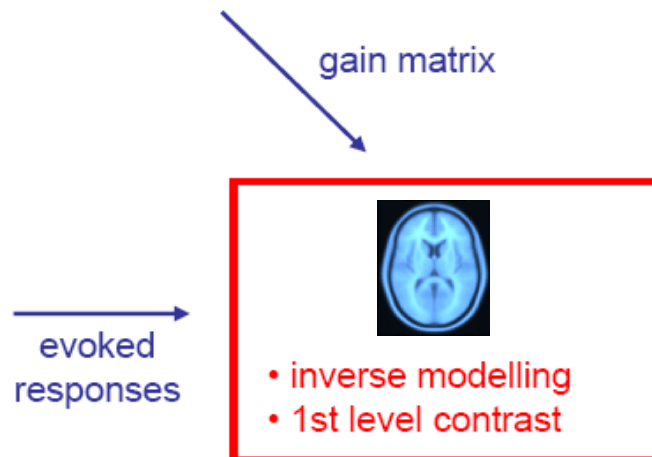
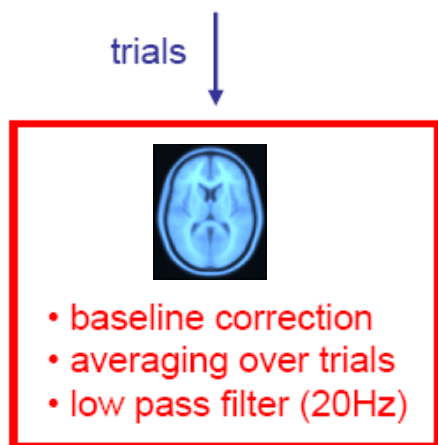
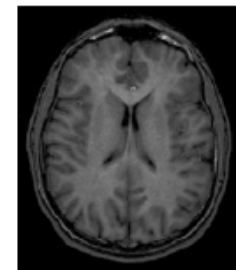
EEG/MEG data



Sensor locations

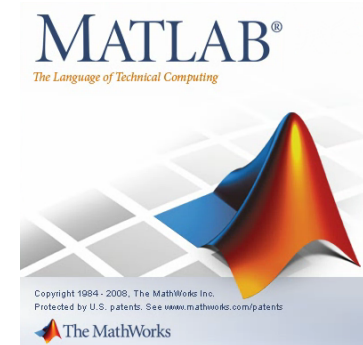


structural MRI



# Software: **SPM8**

- ❑ Open Source academic freeware (under GPL)
- ❑ Documented and informally supported
- ❑ Requirements:
  - MATLAB: **7.1** (R14SP3) to **7.10** (R2010a)  
no Mathworks toolboxes required
  - Supported platforms (MEX files):



*Linux (32 and 64 bit)*

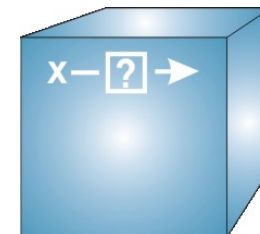


*Windows (32 and 64 bit)*

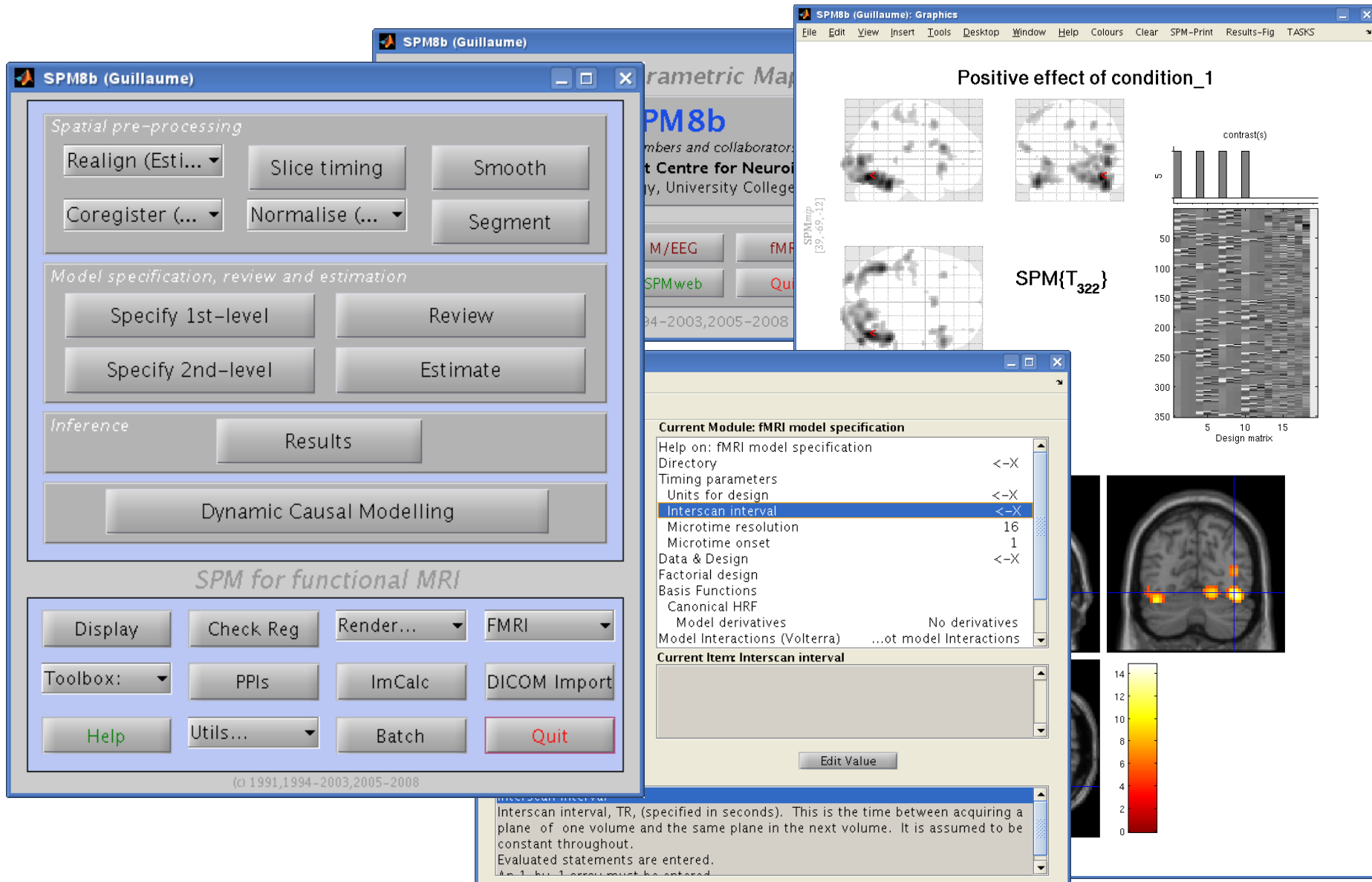


*Mac Intel (32 and 64 bit)*

- File Formats:
  - Images: NIfTI-1 (& Analyze, DICOM)
  - Surface meshes: GIfTI
  - M/EEG: most manufacturers (with FieldTrip's fileio)



# SPM Interface



The screenshot displays the SPM8b (Guillaume) interface, which is organized into several key sections:

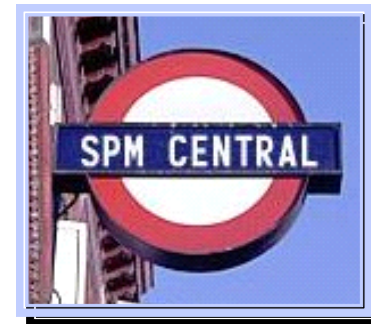
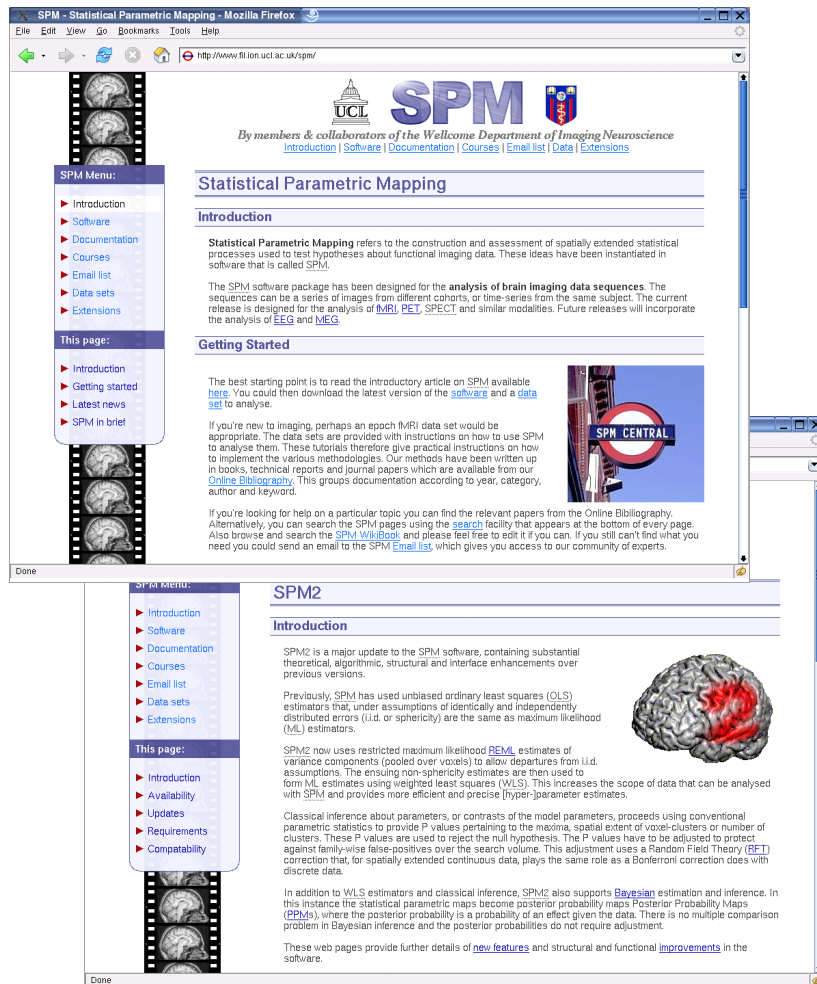
- Spatial pre-processing:** Includes buttons for Realign (Esti...), Slice timing, Smooth, Coregister (...), Normalise (...), and Segment.
- Model specification, review and estimation:** Contains buttons for Specify 1st-level, Review, Specify 2nd-level, and Estimate.
- Inference:** Features a Results button and a large Dynamic Causal Modelling button.
- SPM for functional MRI:** A bottom toolbar with buttons for Display, Check Reg, Render..., FMRI, Toolbox:, PPIs, ImCalc, DICOM Import, Help, Utils..., Batch, and Quit.

Overlaid on the main interface are several other windows:

- SPM8b (Guillaume):** The main application window, partially obscured.
- SPM8b (Guillaume): Graphics:** A window titled "Positive effect of condition\_1" showing brain slices with activation clusters. It includes a contrast bar chart, a design matrix, and a color scale for  $SPM\{T_{322}\}$ .
- Current Module: fMRI model specification:** A configuration window for fMRI parameters. The "Interscan interval" is highlighted, with a value of 16. Other parameters include Microtime resolution (16), Microtime onset (1), and Data & Design (No derivatives).
- Help window:** A text window explaining the "Interscan interval, TR, (specified in seconds). This is the time between acquiring a plane of one volume and the same plane in the next volume. It is assumed to be constant throughout. Evaluated statements are entered. An 1 by 1 array must be entered."

# SPMweb

- ❑ Introduction to SPM
- ❑ SPM distribution: SPM2, SPM5, SPM8
- ❑ Documentation & Bibliography
- ❑ SPM email discussion list
- ❑ SPM short course
- ❑ Example data sets
- ❑ SPM extensions

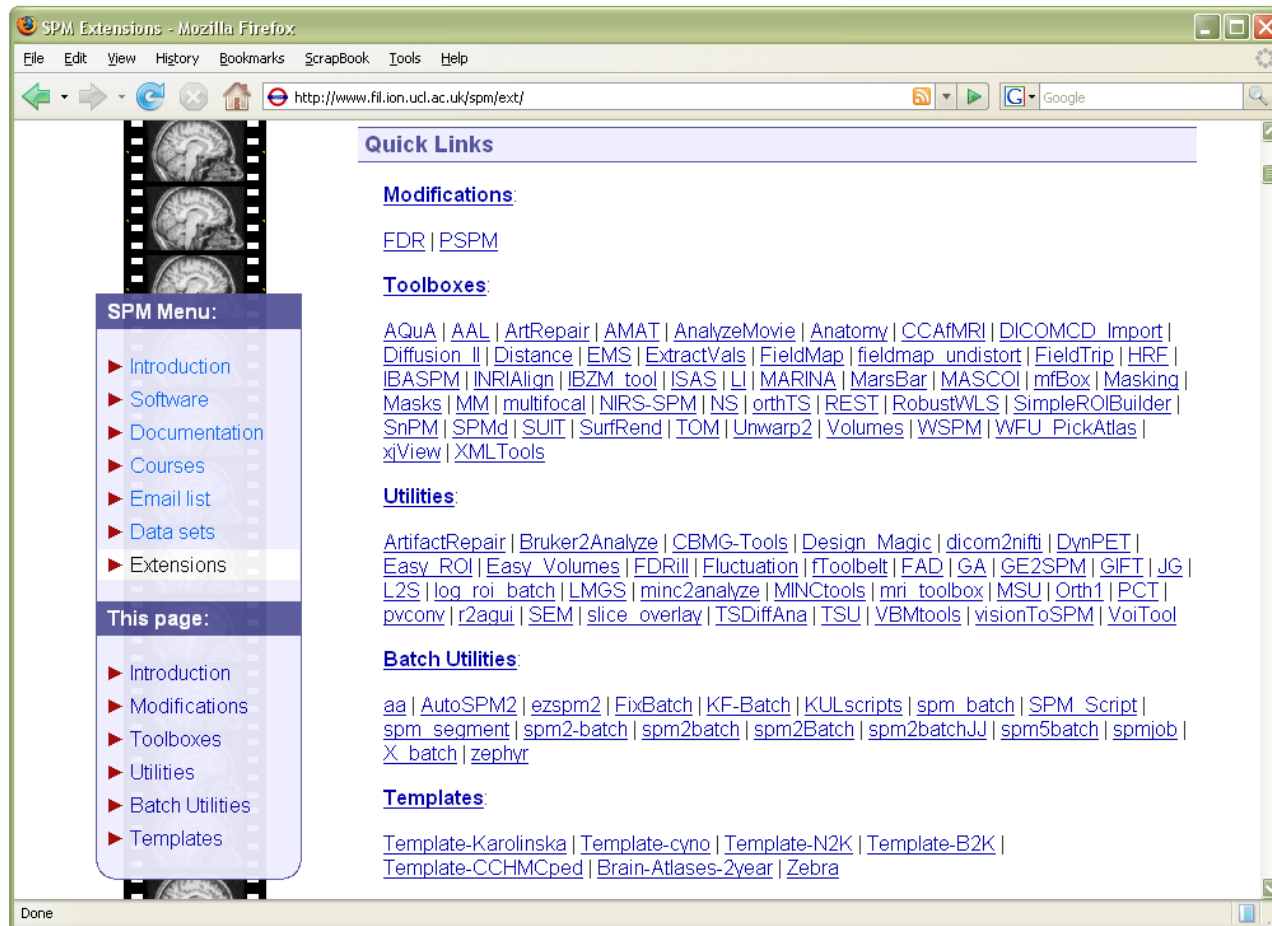


<http://www.fil.ion.ucl.ac.uk/spm/>

# SPM Toolboxes

## □ User-contributed SPM extensions:

*<http://www.fil.ion.ucl.ac.uk/spm/ext/>*





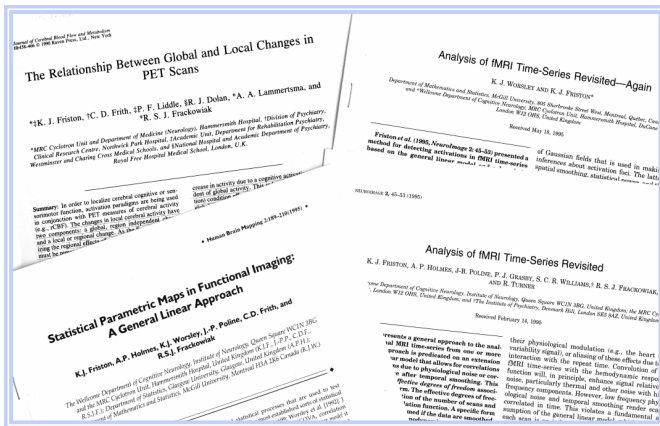
# SPM Documentation

## Peer reviewed literature

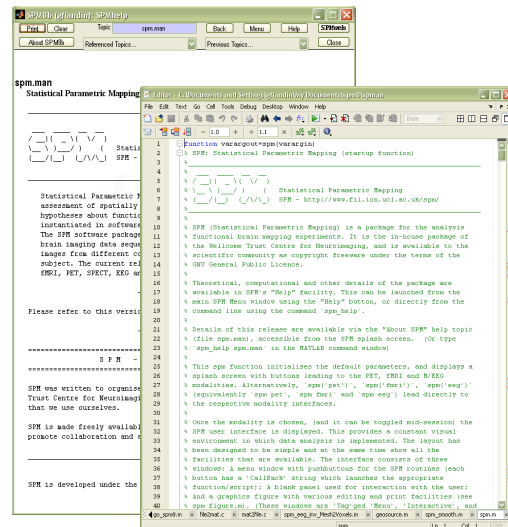
# SPM Books:

## *Human Brain Function I & II*

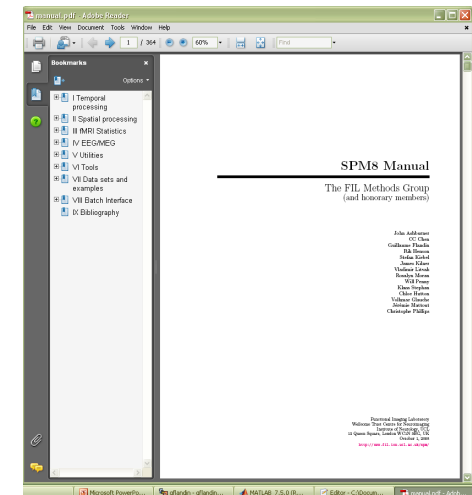
## *Statistical Parametric Mapping*



Online help  
& function  
descriptions



SPM Manual





# SPM Online Bibliography



Publications about 'RFT' - Mozilla Firefox

File Edit View History Bookmarks ScrapBook Tools Help

http://www.fil.ion.ucl.ac.uk/spm/doc/biblio/Keyword/RFT.html

Google

## Publications about 'RFT'

### Thesis

1. [A.P. Holmes](#). **Statistical Issues in Functional Brain Mapping**. PhD thesis, University of Glasgow, December 1994.  Keyword(s): [RFT](#), [PET](#), [GLM](#). [\[bibtex-entry\]](#)

### Articles in journal or book chapters

1. [J. Chumbley](#) and [K.J. Friston](#). **False Discovery Rate Revisited: FDR and Topological Inference Using Gaussian Random Fields**. *NeuroImage*, 2008.  Keyword(s): [FDR](#), [RFT](#). [\[bibtex-entry\]](#)
2. D. Pantazis, [T.E. Nichols](#), S. Baillet, and R.M. Leahy. **A comparison of random field theory and permutation methods for the statistical analysis of MEG data.** *NeuroImage*, 25:383-394, 2005.  Keyword(s): [RFT](#), [MEG](#), [nonparametric](#). [\[bibtex-entry\]](#)
3. S. Hayasaka, K.L. Phan, I. Liberzon, [K.J. Worsley](#), and [T.E. Nichols](#). **Non-Stationary Cluster Size Inference with Random Field and Permutation Methods**. *NeuroImage*, 22:676-687, 2004.  Keyword(s): [Cluster](#), [RFT](#), [nonparametric](#). [\[bibtex-entry\]](#)

**SPM Menu:**

- ▶ Introduction
- ▶ Software
- ▶ Documentation
- ▶ Courses
- ▶ Email list
- ▶ Data sets
- ▶ Extensions

**This page:**

- ▶ Bibliography

Done

# External Resources

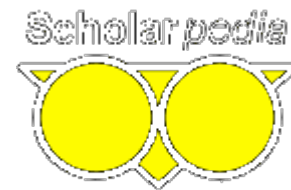
❑ **SPM @ Wikipedia**

*[http://en.wikipedia.org/wiki/Statistical\\_parametric\\_mapping](http://en.wikipedia.org/wiki/Statistical_parametric_mapping)*



❑ **SPM @ Scholarpedia**

*<http://www.scholarpedia.org/article/SPM>*



❑ **SPM @ WikiBooks**

*<http://en.wikibooks.org/wiki/SPM>*



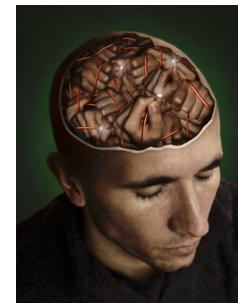
❑ **MRC-CBU Imaging/MEG wiki**

*<http://imaging.mrc-cbu.cam.ac.uk/imaging/Cbulmaging>*

*<http://imaging.mrc-cbu.cam.ac.uk/meg>*

❑ **SPM @ NITRC**

*<http://www.nitrc.org/projects/spm/>*



# SPM Mailing List

- ❑ [spm@jiscmail.ac.uk](mailto:spm@jiscmail.ac.uk)
- ❑ Web home page
  - <http://www.fil.ion.ucl.ac.uk/spm/support/>
  - Archives, archive searches, instructions
- ❑ Subscribe
  - <http://www.jiscmail.ac.uk/>
  - email [jiscmail@jiscmail.ac.uk](mailto:jiscmail@jiscmail.ac.uk)
  - join spm Firstname Lastname
- ❑ Participate & learn
  - email [spm@jiscmail.ac.uk](mailto:spm@jiscmail.ac.uk)
  - Monitored by SPMauthors
  - Usage queries, theoretical discussions, bug reports, patches, techniques, &c...

