

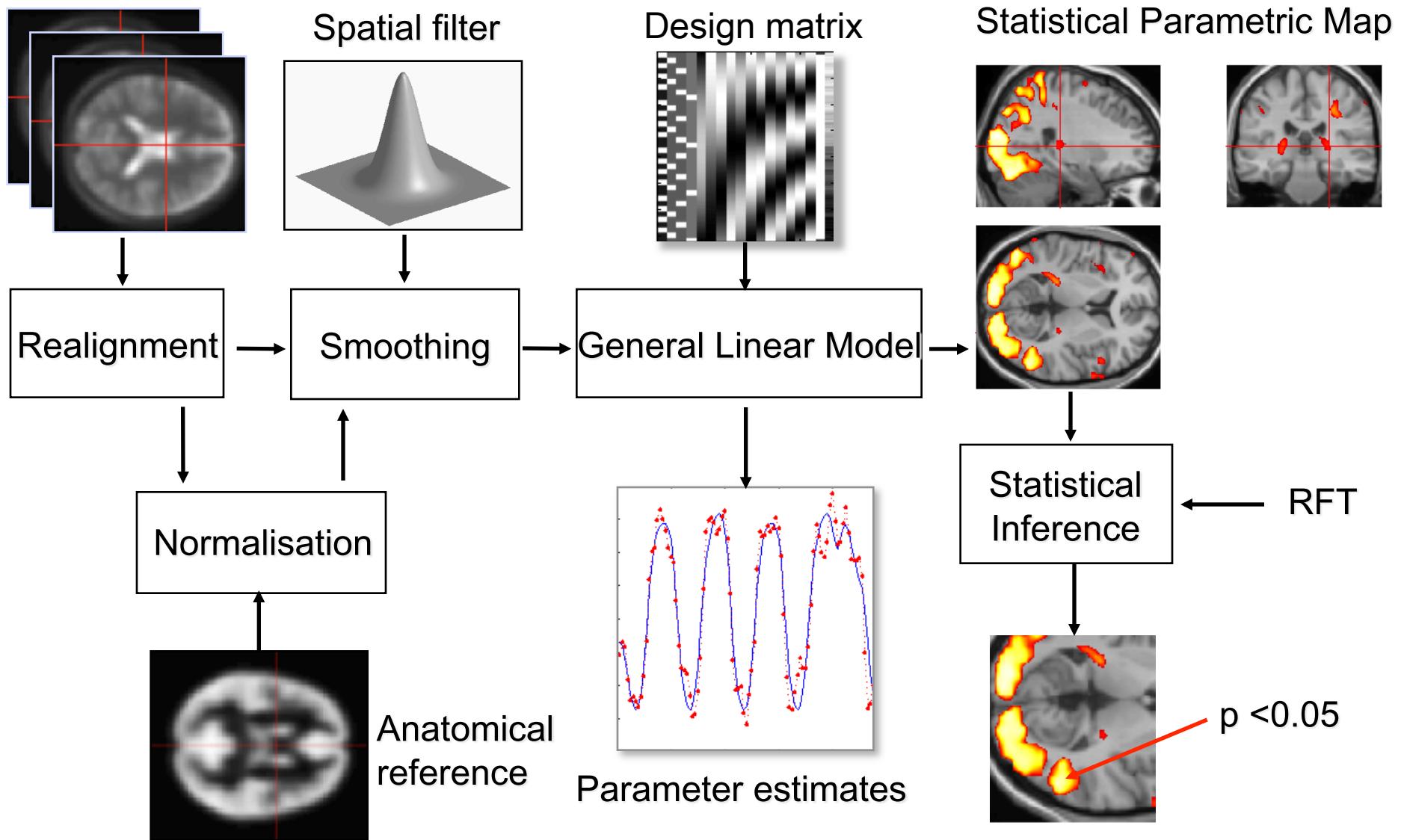


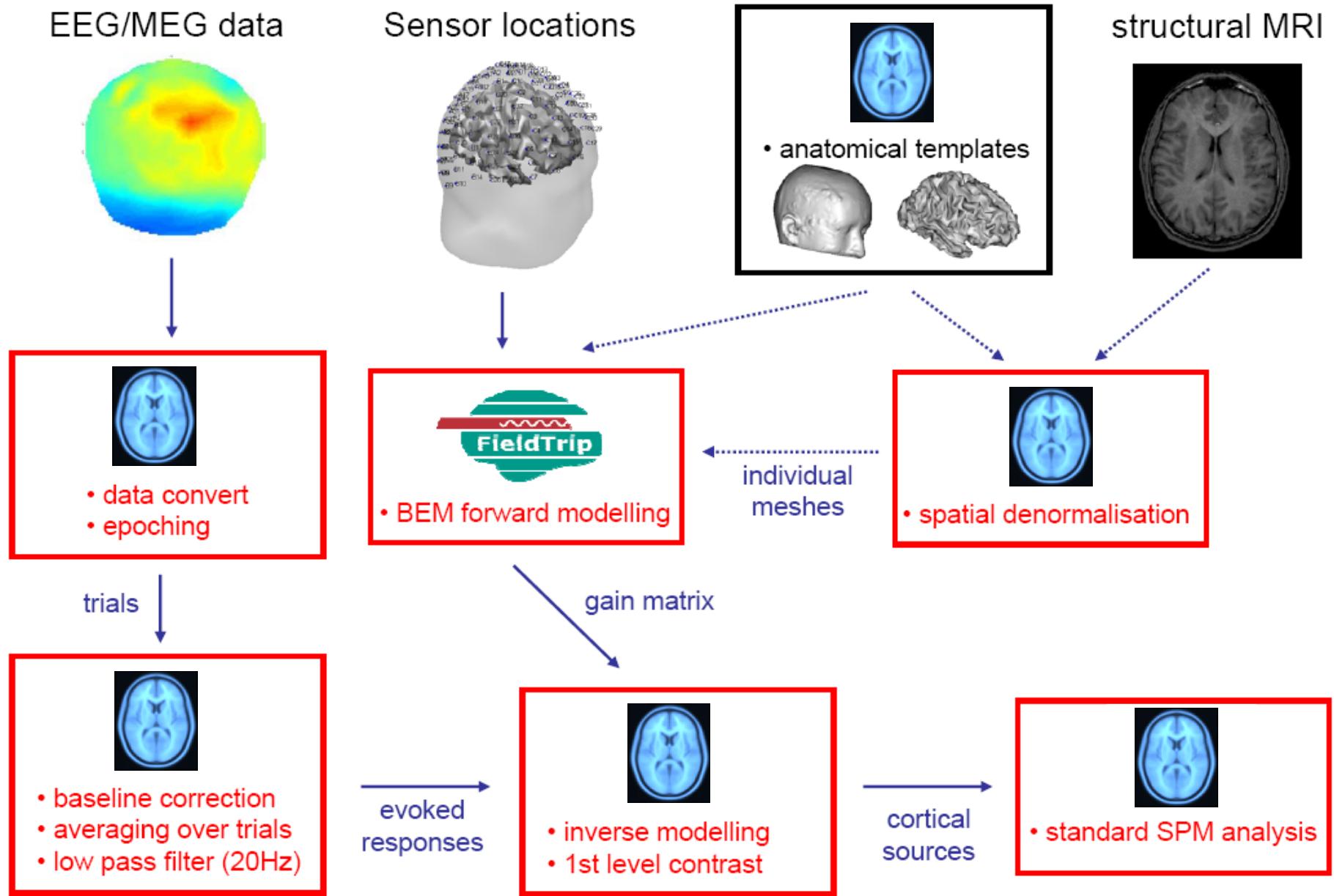
# SPM Software & Resources

Wellcome Trust Centre for Neuroimaging  
University College London

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

## Image time-series





# Software: SPM

- 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)*

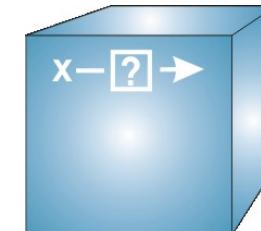


*Windows (32 and 64 bit)*



*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

**SPM8b (Guillaume)**

**Spatial pre-processing**

- Realign (Esti...)
- Slice timing
- Smooth
- Coregister (...)
- Normalise (...)
- Segment

**Model specification, review and estimation**

- Specify 1st-level
- Review
- Specify 2nd-level
- Estimate

**Inference**

- Results

**Dynamic Causal Modelling**

**SPM for functional MRI**

- Display
- Check Reg
- Render... ▾
- FMRI ▾
- Toolbox: ▾
- PPIs
- ImCalc
- DICOM Import
- Help
- Utils... ▾
- Batch
- Quit

(c) 1991,1994–2003,2005–2008

**SPM8b (Guillaume): Graphics**

**Parametric Map**

**Positive effect of condition\_1**

**SPM8b**  
Members and collaborators  
at Centre for Neurology, University College London, University College London, United Kingdom

**M/EEG** fMRI

**SPMweb** **Quickstart**

94–2003,2005–2008

**Current Module: fMRI model specification**

Help on: fMRI model specification  
 Directory  
 Timing parameters  
 Units for design  
**Interscan interval**  
 Microtime resolution  
 Microtime onset  
 Data & Design  
 Factorial design  
 Basis Functions  
 Canonical HRF  
 Model derivatives  
 Model Interactions (Volterra)  
 ...ot model Interactions  
 No derivatives  
 Model Interactions (Volterra)  
 ...ot model Interactions

**Current Item: Interscan interval**

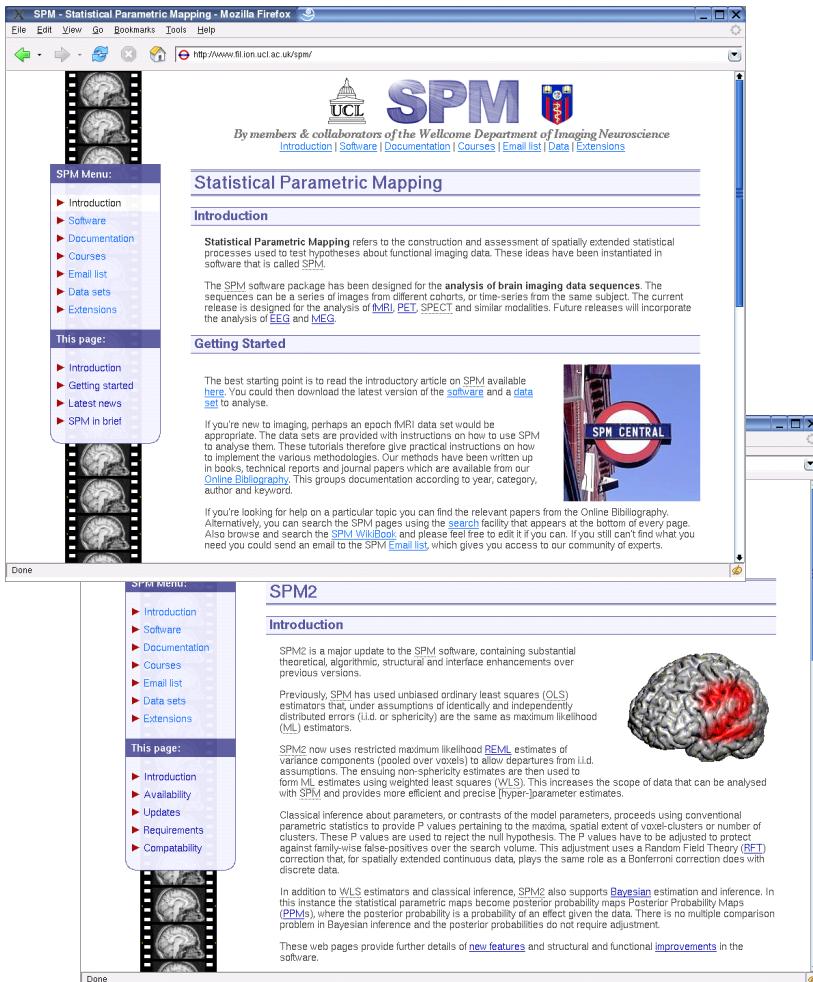
16  
 1  
 <-X  
 <-X  
 <-X

**Edit Value**

14  
 12  
 10  
 8  
 6  
 4  
 2  
 0

**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.**  
 $\text{An } 1 \text{ by } 1 \text{ array must be entered.}$

# SPMweb



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

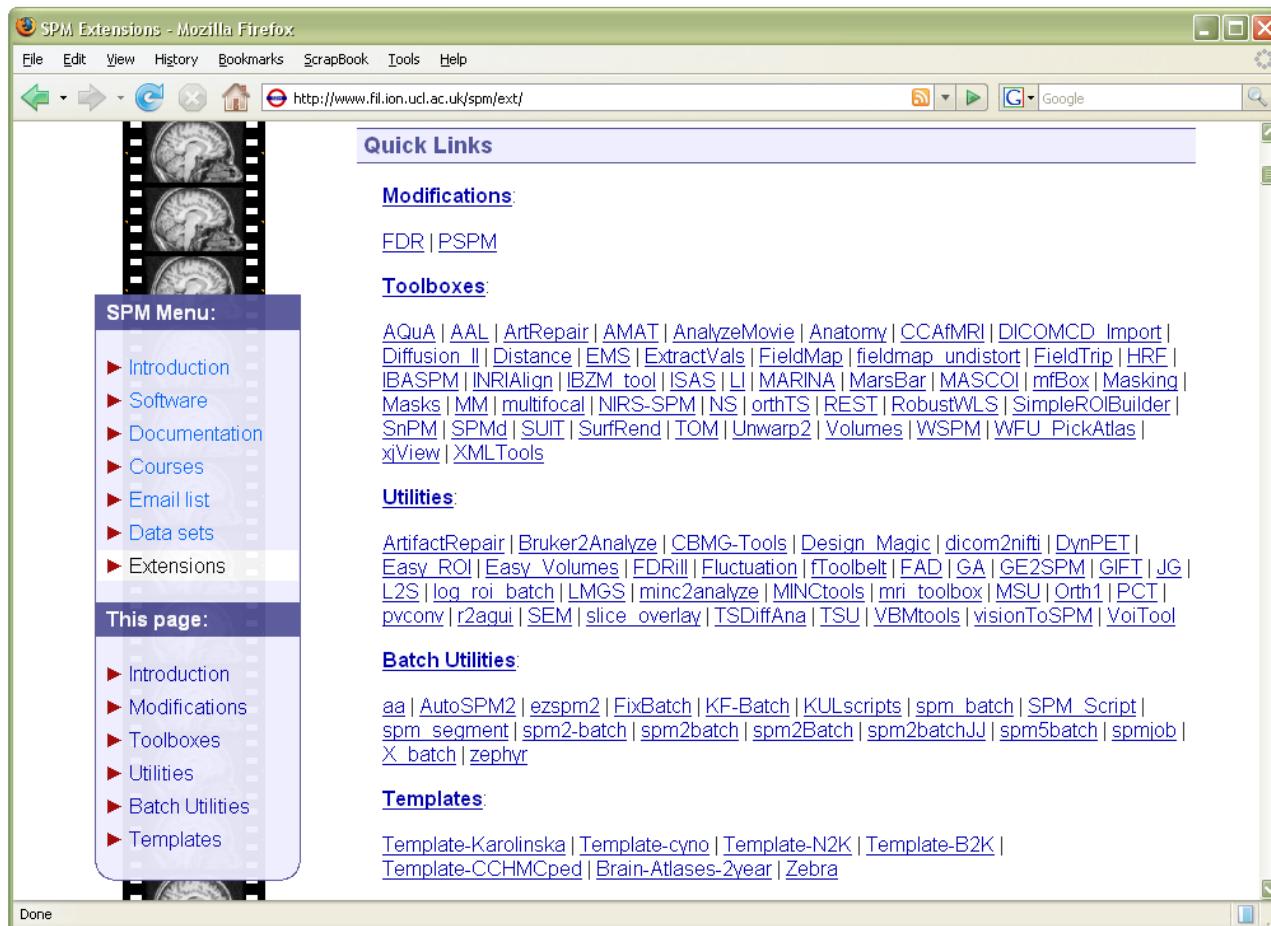


<http://www.fil.ion.ucl.ac.uk/spm/>

# SPM Toolboxes

## □ User-contributed SPM extensions:

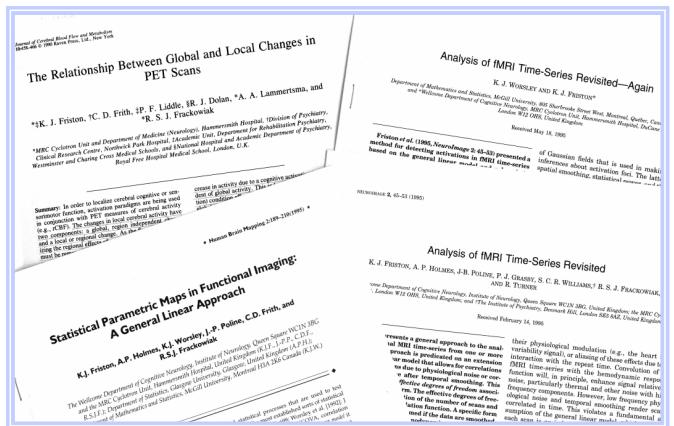
*<http://www.fil.ion.ucl.ac.uk/spm/ext/>*



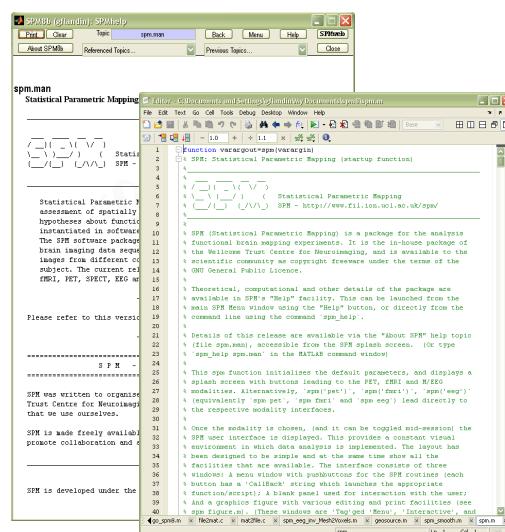
The screenshot shows a Mozilla Firefox browser window displaying the "SPM Extensions" website at <http://www.fil.ion.ucl.ac.uk/spm/ext/>. The page features a sidebar on the left with a "SPM Menu" containing links like Introduction, Software, Documentation, Courses, Email list, Data sets, and Extensions. Below this is a "This page:" section with links to Introduction, Modifications, Toolboxes, Utilities, Batch Utilities, and Templates. The main content area includes a "Quick Links" section with "Modifications" (FDR | PSPM) and "Toolboxes" (AQuA, AAL, ArtRepair, AMAT, AnalyzeMovie, Anatomy, CCAfMRI, DICOMCD Import, Diffusion\_II, Distance, EMS, ExtractVals, FieldMap, fieldmap\_undistort, FieldTrip, HRF, IBASPM, INRIAlign, IBZM\_tool, ISAS, LI, MARINA, MarsBar, MASCOI, mBox, Masking, Masks, MM, multifocal, NIRS-SPM, NS, orthTS, REST, RobustWLS, SimpleROIBuilder, SnPM, SPMd, SUIT, SurfRend, TOM, Unwarp2, Volumes, WSPM, WFU\_PickAtlas, xView, XMLTools). It also lists "Utilities" (ArtifactRepair, Bruker2Analyze, CBMG-Tools, Design\_Magic, dicom2nifti, DynPET, Easy\_ROI, Easy\_Volumes, FDRill, Fluctuation, fToolbelt, FAD, GA, GE2SPM, GIFT, JG, L2S, log\_roi\_batch, LMGS, minc2analyze, MINCtools, mri\_toolbox, MSU, Orth1, PCT, pvconv, r2agui, SEM, slice\_overlay, TSDiffAna, TSU, VBMtools, visionToSPM, VoiTool), "Batch Utilities" (aa, AutoSPM2, ezspm2, FixBatch, KF-Batch, KULscripts, spm\_batch, SPM\_Script, spm\_segment, spm2-batch, spm2batch, spm2Batch, spm2batchJJ, spm5batch, spmjob, X\_batch, zephyr), and "Templates" (Template-Karolinska, Template-cyno, Template-N2K, Template-B2K, Template-CCHMCped, Brain-Atlases-2year, Zebra).

# SPM Documentation

## Peer reviewed literature

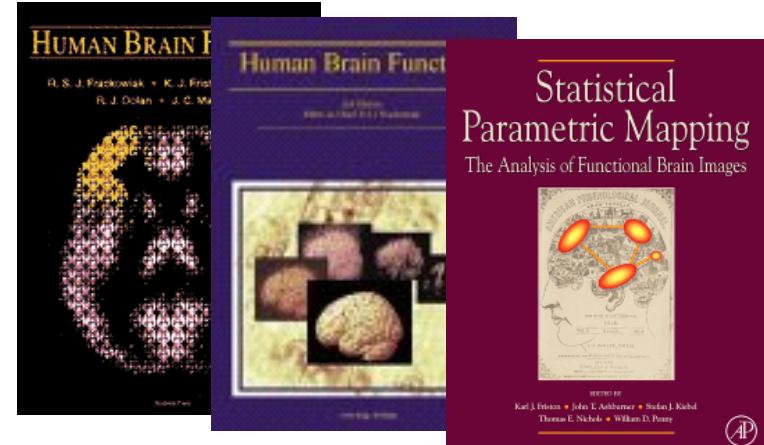


Online help  
& function  
descriptions

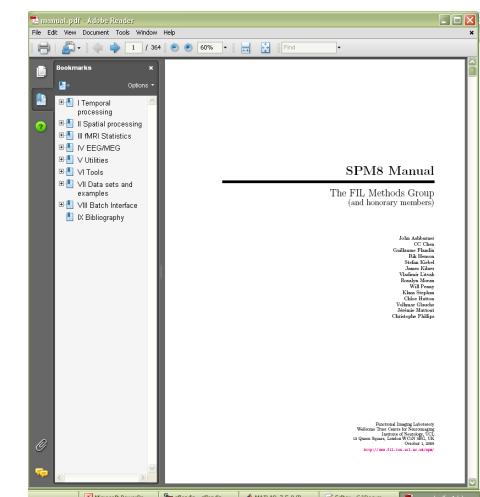


## SPM Books:

### *Human Brain Function I & II* *Statistical Parametric Mapping*



## SPM Manual



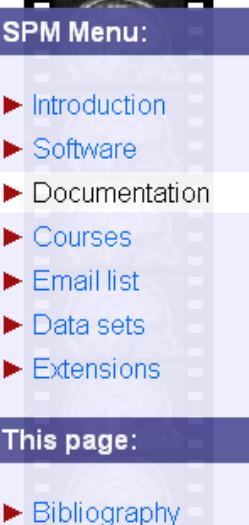
# SPM Online Bibliography

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

A vertical sidebar titled "SPM Menu:" on a blue header. It contains links: Introduction, Software, Documentation, Courses, Email list, Data sets, Extensions, This page:, and Bibliography. The "Bibliography" link is highlighted with a red box.

Three grayscale brain scan images arranged vertically, framed by a black border.

**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](#). [\[bibtex-entry\]](#)

Done

# External Resources

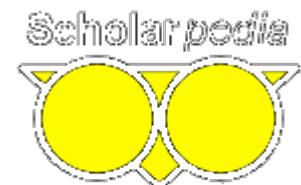
## SPM @ Wikipedia

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



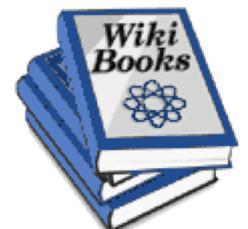
## SPM @ Scholarpedia

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



## SPM @ WikiBooks

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



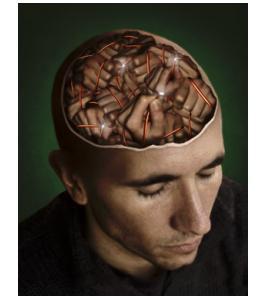
## MRC-CBU Imaging/MEG wiki

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

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

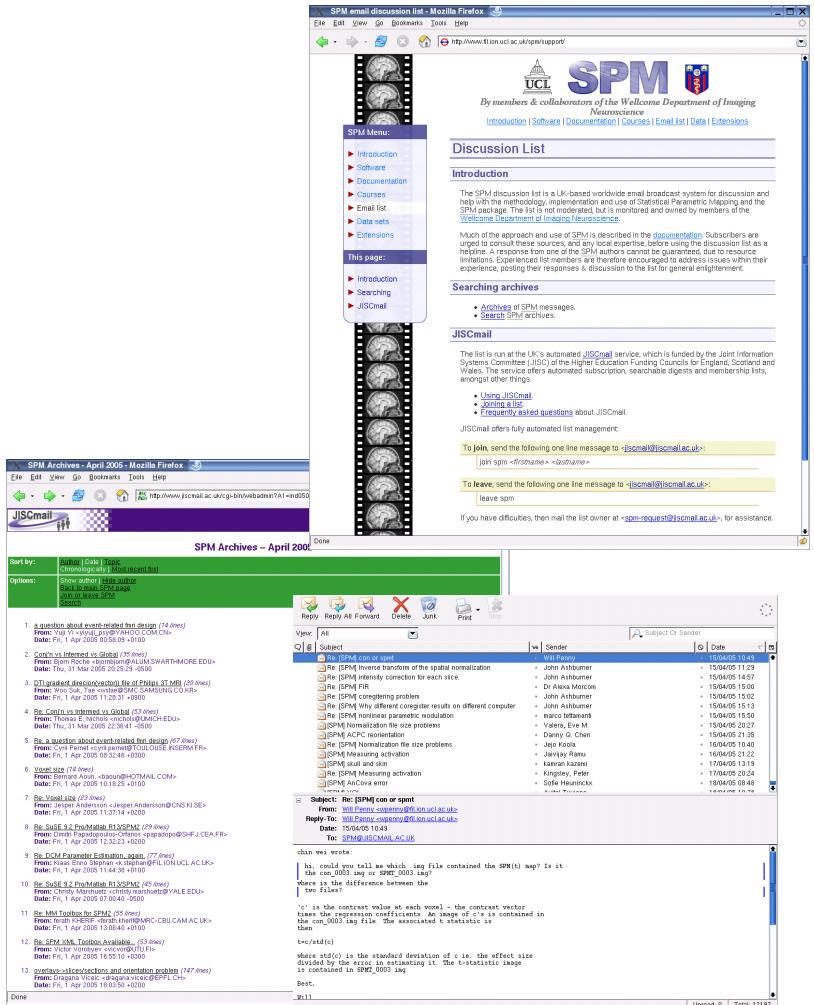
## SPM @ NITRC

<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...



The SPM mailing list is a UK-based worldwide email broadcast system for discussion and help with the implementation, implementation and use of Statistical Parametric Mapping and the SPM software. The list is run by the Wellcome Department of Imaging Neuroscience. It is moderated and owned by members of the Wellcome Department of Imaging Neuroscience.

The list is run by the UK's automated JISCmail service, which is funded by the Joint Information Systems Committee (JISC) of the Higher Education Funding Councils for England, Scotland and Wales. The service offers automated subscription, searchable digests and membership lists, along with a range of other features.

JISCmail offers fully automated list management:

- To join, send the following one line message to [join.spm@jiscmail.ac.uk](mailto:join.spm@jiscmail.ac.uk).
- To leave, send the following one line message to [leave.spm@jiscmail.ac.uk](mailto:leave.spm@jiscmail.ac.uk).
- If you have difficulties, then mail the list owner at [spm-request@jiscmail.ac.uk](mailto:spm-request@jiscmail.ac.uk), for assistance.

**SPM email discussion list - Mozilla Firefox**

SPM Mailing List - Mozilla Firefox

SPM Menu:

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

This page:

- Introduction
- Searching
- JISCmail

**Discussion List**

**Introduction**

The SPM mailing list is a UK-based worldwide email broadcast system for discussion and help with the implementation, implementation and use of Statistical Parametric Mapping and the SPM software. The list is run by the Wellcome Department of Imaging Neuroscience.

Much of the approach and use of SPM is described in the documentation. Subscribers are urged to consult these sources, and any local expertise, before using the discussion list as a helpdesk. The list is moderated and owned by members of the Wellcome Department of Imaging Neuroscience. Experienced list members are therefore encouraged to address issues within their experience, posting their responses & discussion to the list for general enlightenment.

**Searching archives**

- Archives of SPM messages
- Search SPMx archives

**JISCmail**

This list is run by the UK's automated JISCmail service, which is funded by the Joint Information Systems Committee (JISC) of the Higher Education Funding Councils for England, Scotland and Wales. The service offers automated subscription, searchable digests and membership lists, along with a range of other features.

JISCmail offers fully automated list management:

To join, send the following one line message to [join.spm@jiscmail.ac.uk](mailto:join.spm@jiscmail.ac.uk).

To leave, send the following one line message to [leave.spm@jiscmail.ac.uk](mailto:leave.spm@jiscmail.ac.uk).

If you have difficulties, then mail the list owner at [spm-request@jiscmail.ac.uk](mailto:spm-request@jiscmail.ac.uk), for assistance.

**SPM Archives – April 2005 - Mozilla Firefox**

SPM Archives – April 2005

Start by: Author | Date | From | Chronologically | Most recent first

Options: Show author | Hide author | Show date | Hide date | Show from | Hide from | Show SPM | Hide SPM

Reply | Reply All | Forward | Delete | X | Junk | Print | Subject or Sender

View: All | Subject

Sender: Will Penny

Date: 15/04/05 10:43

Re: SPM con voxel

From: Will Penny <[will.penny@ion.ucl.ac.uk](mailto:will.penny@ion.ucl.ac.uk)>

Date: Fri, 1 Apr 2005 11:23:41 +0000

2. Conf vs Inferred vs Global (75 lines)

From: John Ashburner <[john.a.shibber@ucl.ac.uk](mailto:john.a.shibber@ucl.ac.uk)>

Date: Thu, 31 Mar 2005 22:30:23 +0000

3. OT gradient descovolution file of Philips ITMB (69 lines)

From: Philip H. G. Tijms <[philip.tijms@med.vu.nl](mailto:philip.tijms@med.vu.nl)>

Date: Fri, 1 Apr 2005 11:23:41 +0000

4. Re: Conth vs Inferred vs Global (3 lines)

From: Will Penny <[will.penny@ion.ucl.ac.uk](mailto:will.penny@ion.ucl.ac.uk)>

Date: Thu, 31 Mar 2005 22:30:41 +0000

5. Re: A question about event related fMRI design (77 lines)

From: John Ashburner <[john.a.shibber@ucl.ac.uk](mailto:john.a.shibber@ucl.ac.uk)>

Date: Fri, 1 Apr 2005 05:32:44 +0000

6. Voxel size (74 lines)

From: Will Penny <[will.penny@ion.ucl.ac.uk](mailto:will.penny@ion.ucl.ac.uk)>

Date: Fri, 1 Apr 2005 10:18:12 +0000

7. Re: Voxel size (23 lines)

From: Will Penny <[will.penny@ion.ucl.ac.uk](mailto:will.penny@ion.ucl.ac.uk)>

Date: Fri, 1 Apr 2005 11:37:14 +0000

8. Re: Sust 3.2 Prevalence RT1/SPM2 (79 lines)

From: David C. Reynolds <[reynolds@jic.ac.uk](mailto:reynolds@jic.ac.uk)>

Date: Fri, 1 Apr 2005 11:37:14 +0000

9. Re: SPM Parameter Estimation: again (77 lines)

From: John Ashburner <[john.a.shibber@ucl.ac.uk](mailto:john.a.shibber@ucl.ac.uk)>

Date: Fri, 1 Apr 2005 11:37:14 +0000

10. Re: Sust 3.2 Prevalence RT1/SPM2 (42 lines)

From: David C. Reynolds <[reynolds@jic.ac.uk](mailto:reynolds@jic.ac.uk)>

Date: Fri, 1 Apr 2005 11:37:14 +0000

11. Re: MM Toolbox for SPM (25 lines)

From: Victor Venkateswaran <[venkateswaran@cam.ac.uk](mailto:venkateswaran@cam.ac.uk)>

Date: Fri, 1 Apr 2005 11:37:14 +0000

12. Re: SPM XML sections and orientation problem (76 lines)

From: Dragana Vukotic <[vukotic@fil.ion.ucl.ac.uk](mailto:vukotic@fil.ion.ucl.ac.uk)>

Date: Fri, 1 Apr 2005 11:37:14 +0000

Done

unread: 0 | total: 12197