

# Tutorial: Basic introduction to SPM

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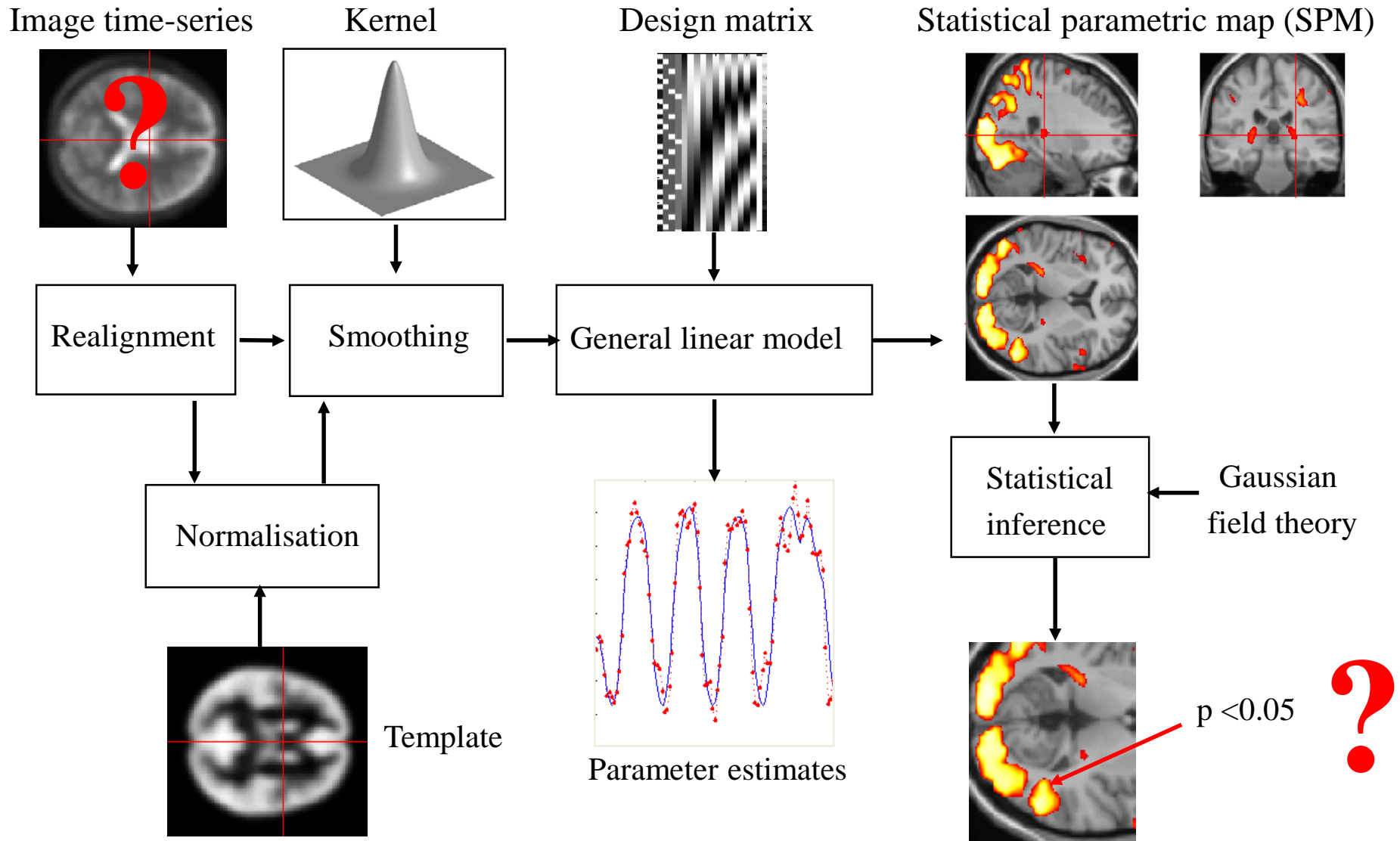


University of  
Zurich<sup>UZH</sup>

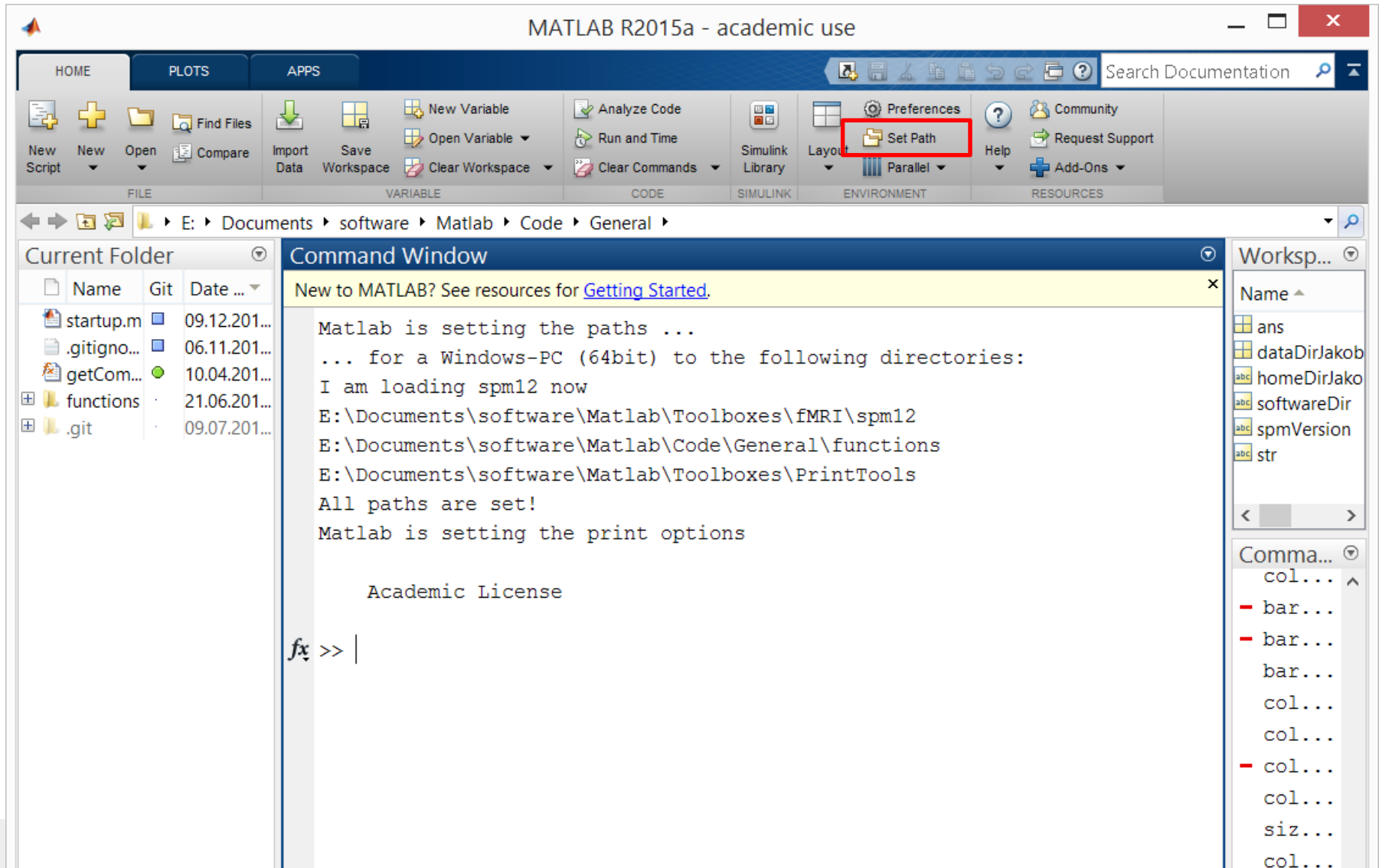
**ETH**

Eidgenössische Technische Hochschule Zürich  
Swiss Federal Institute of Technology Zurich

# Overview of SPM



# Set path for SPM



The image shows the MATLAB R2015a - academic use interface. The 'Set Path' button in the 'ENVIRONMENT' tab is highlighted with a red box. The Command Window displays the following output:

```
Matlab is setting the paths ...  
... for a Windows-PC (64bit) to the following directories:  
I am loading spm12 now  
E:\Documents\software\Matlab\Toolboxes\fmRI\spm12  
E:\Documents\software\Matlab\Code\General\functions  
E:\Documents\software\Matlab\Toolboxes\PrintTools  
All paths are set!  
Matlab is setting the print options  
  
Academic License  
  
fx >> |
```

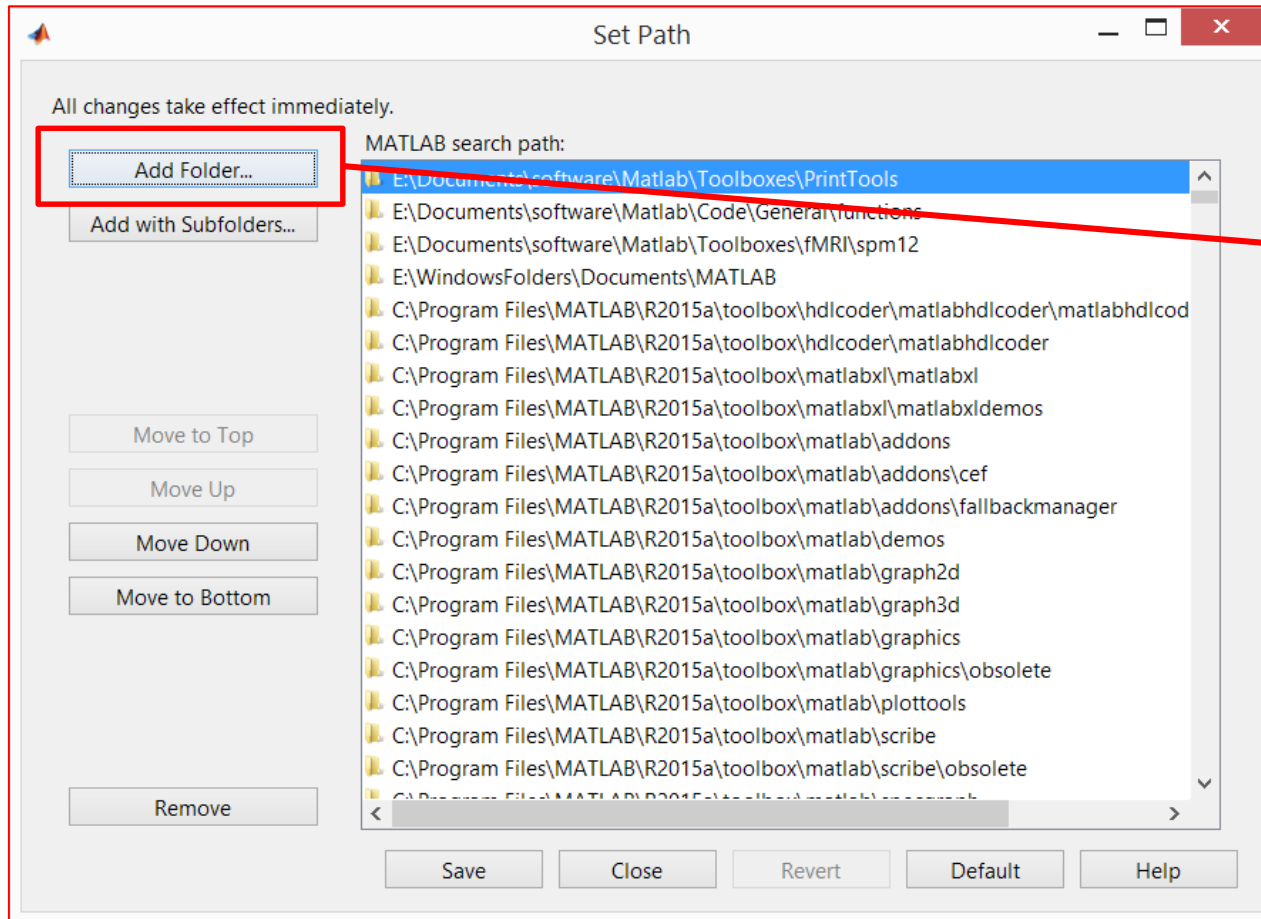
The workspace on the right shows the following variables:

- ans
- dataDirJakob
- homeDirJako
- softwareDir
- spmVersion
- str

The Command Window also shows a list of variables under 'Comma...':

- col...
- bar...
- bar...
- bar...
- col...
- col...
- col...
- col...
- siz...
- col...

# Set path for SPM



Select the SPM folder.

# Starting SPM

The image shows the MATLAB R2015a - academic use interface. The Command Window displays the following text:

```
New to MATLAB? See resources for Getting Started.  
  
Matlab is setting the paths ...  
... for a Windows-PC (64bit) to the following directories:  
I am loading spm12 now  
E:\Documents\software\Matlab\Toolboxes\fmri\spm12  
E:\Documents\software\Matlab\Code\General\functions  
E:\Documents\software\Matlab\Toolboxes\PrintTools  
All paths are set!  
Matlab is setting the print options  
  
Academic License
```

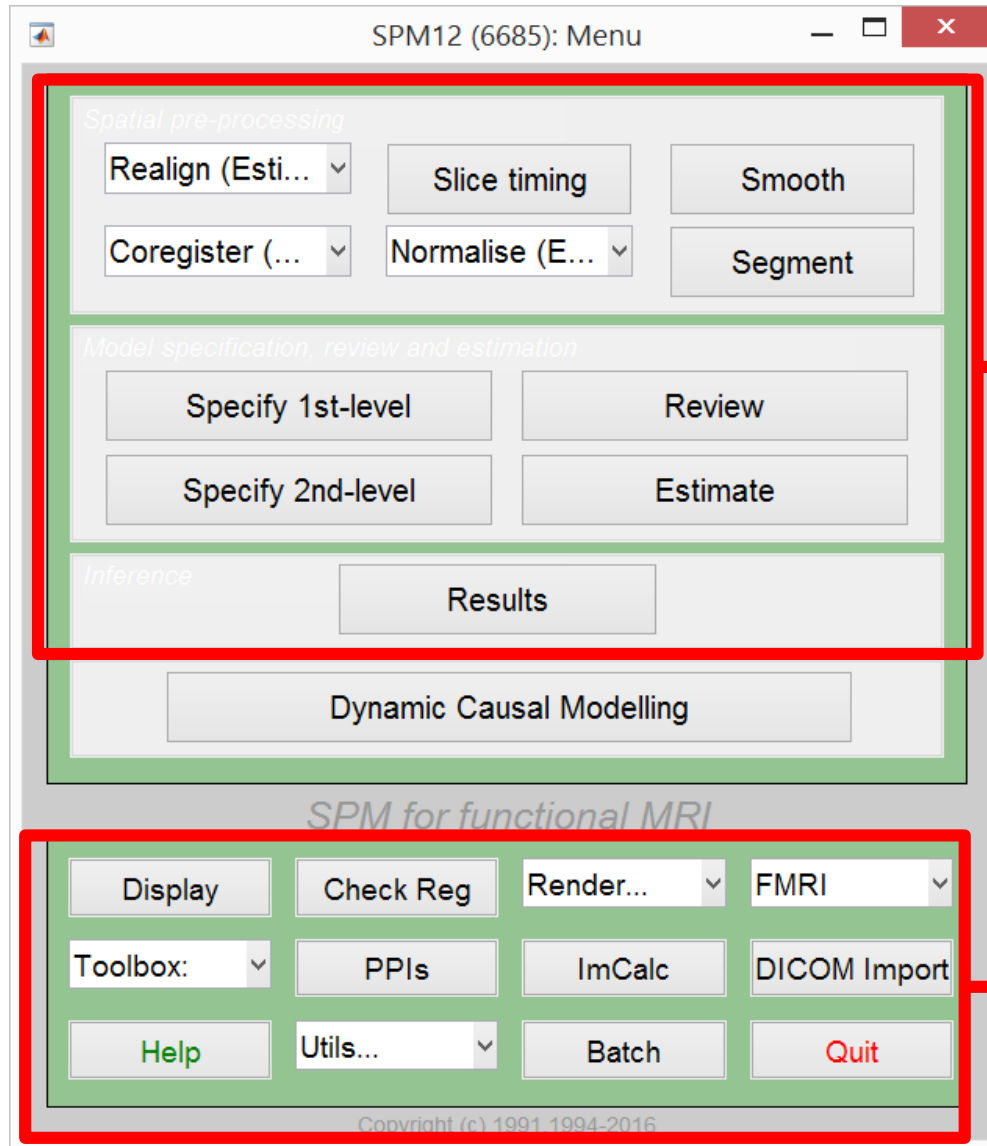
The Command Window prompt shows the command `Type: spm fmri` entered, which is highlighted with a red box.

The Workspace window on the right shows the following variables:

- ans
- dataDirJakob
- homeDirJako
- softwareDir
- spmVersion
- str

The Command Window also shows a list of variables in the workspace, including `col...`, `bar...`, `bar...`, `bar...`, `col...`, `col...`, `col...`, `col...`, `siz...`, and `col...`.

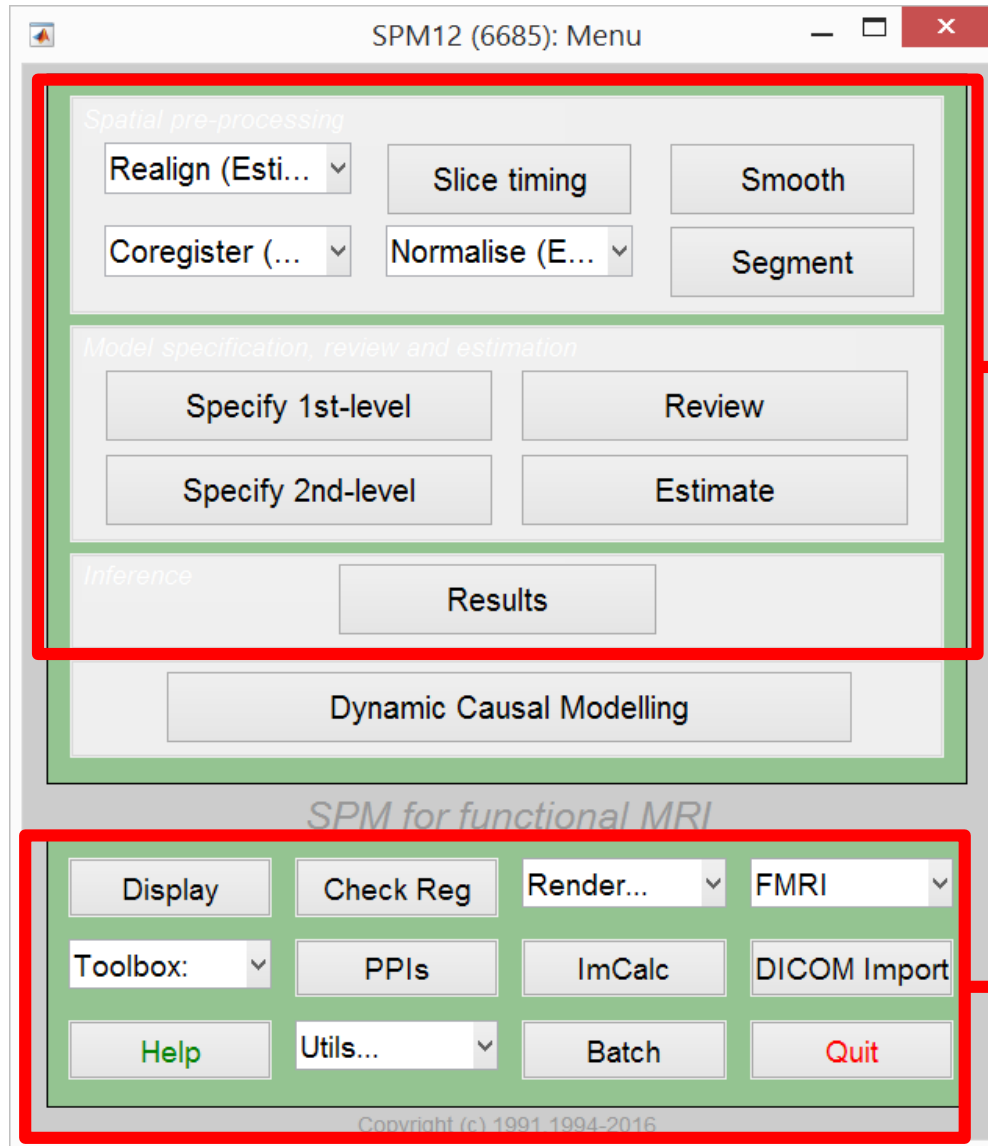
# The SPM main menu



Parts needed for basic fMRI analysis.

Additional useful functions.

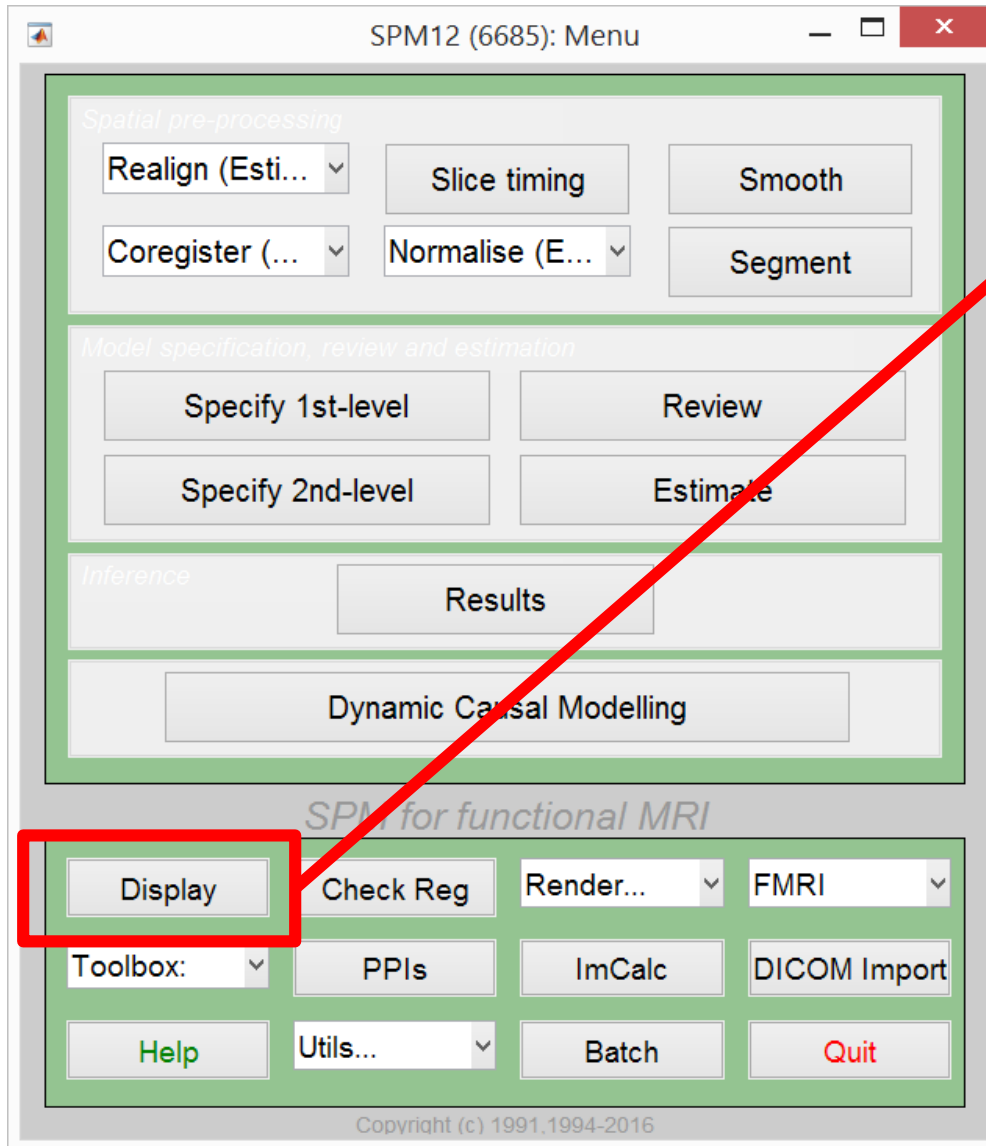
# The SPM main menu



Parts needed for basic fMRI analysis.

Additional useful functions.

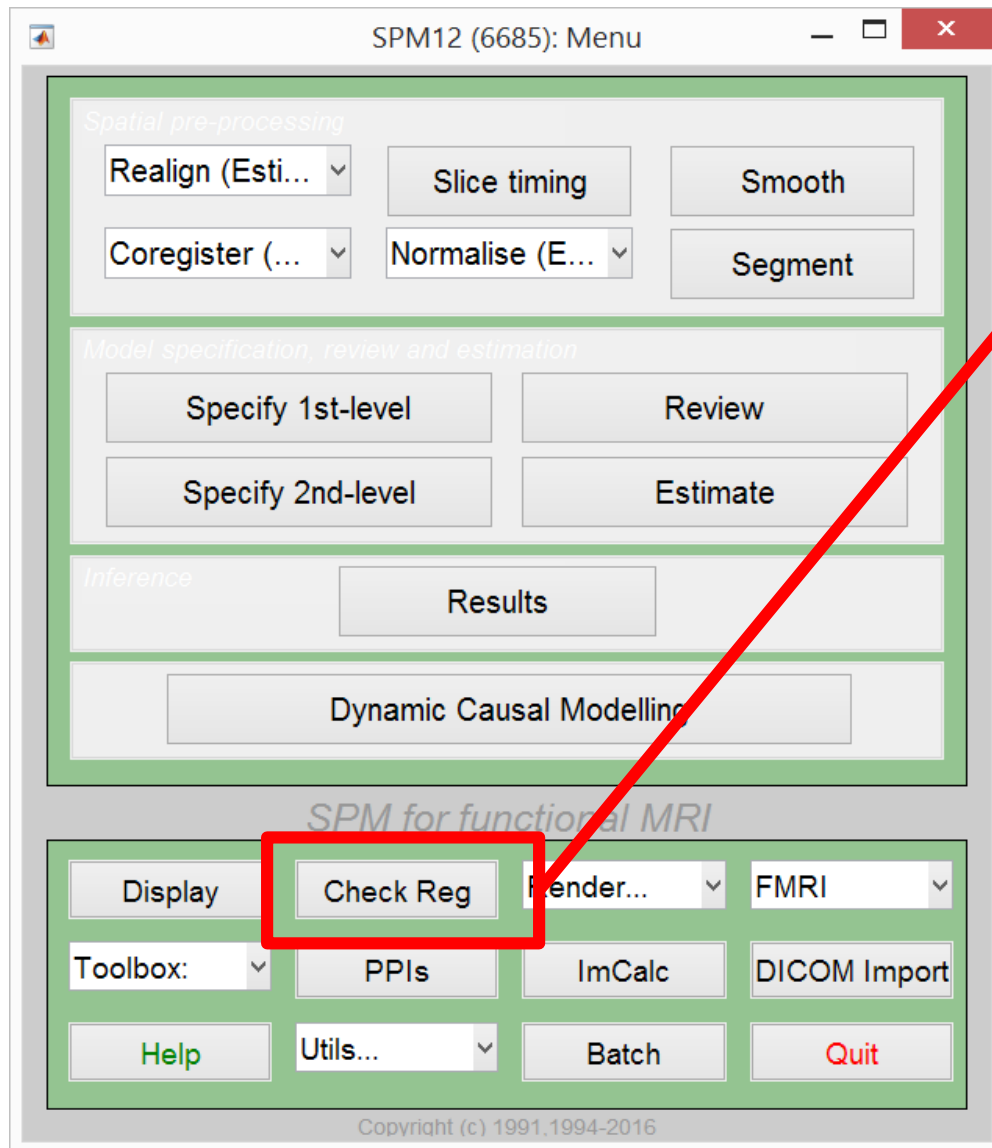
# Display



Display one image.

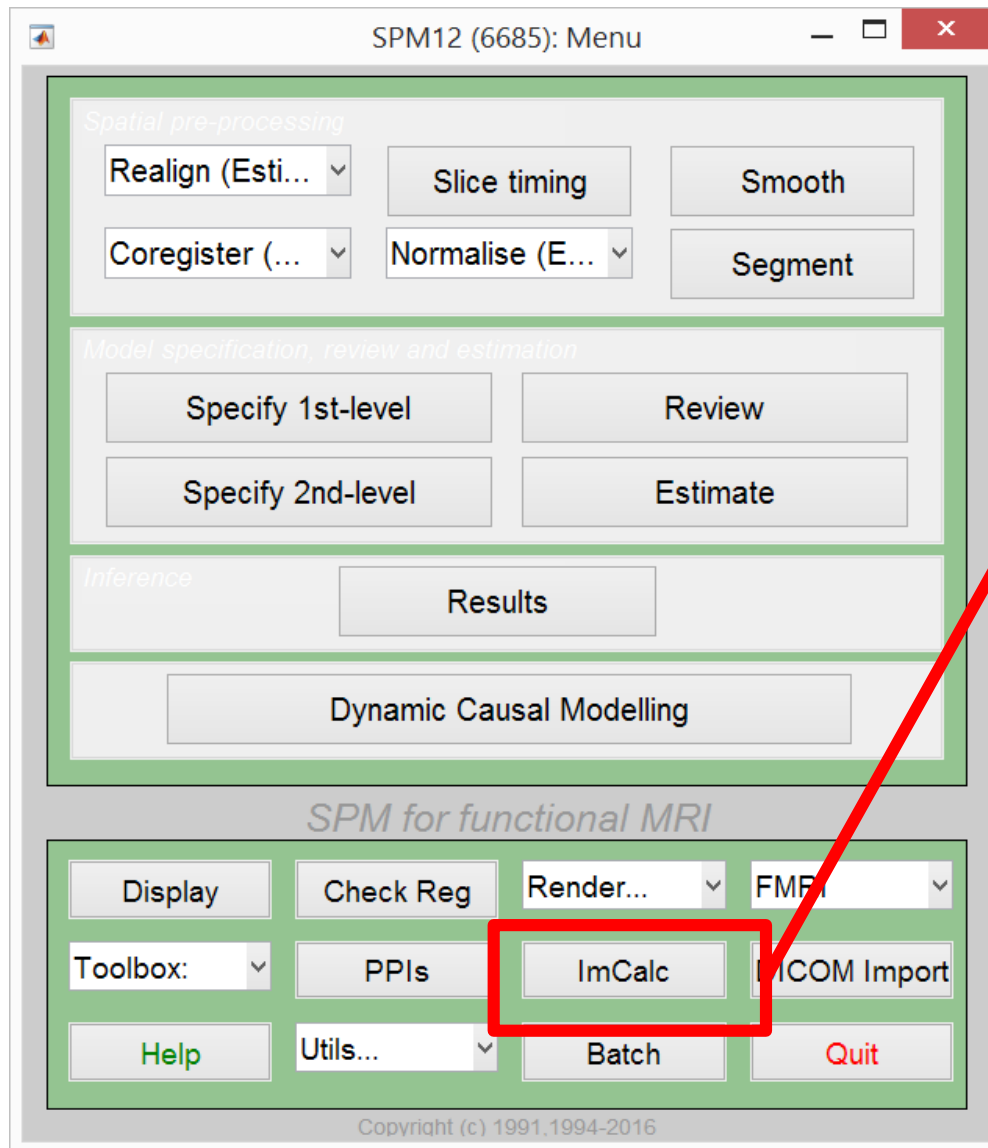


# Check Reg



Display several images for comparison.

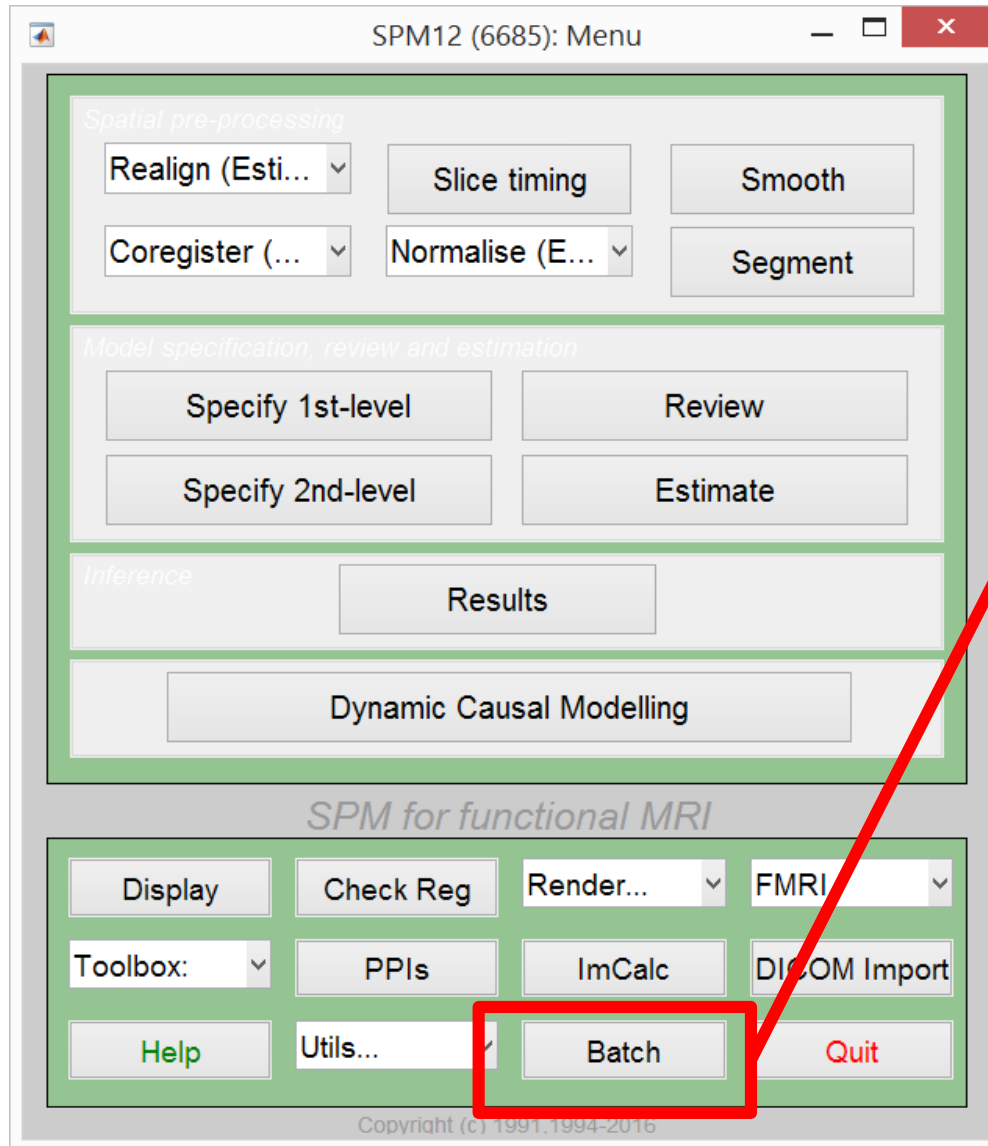
# ImCalc



Do simple calculations with one or several images.

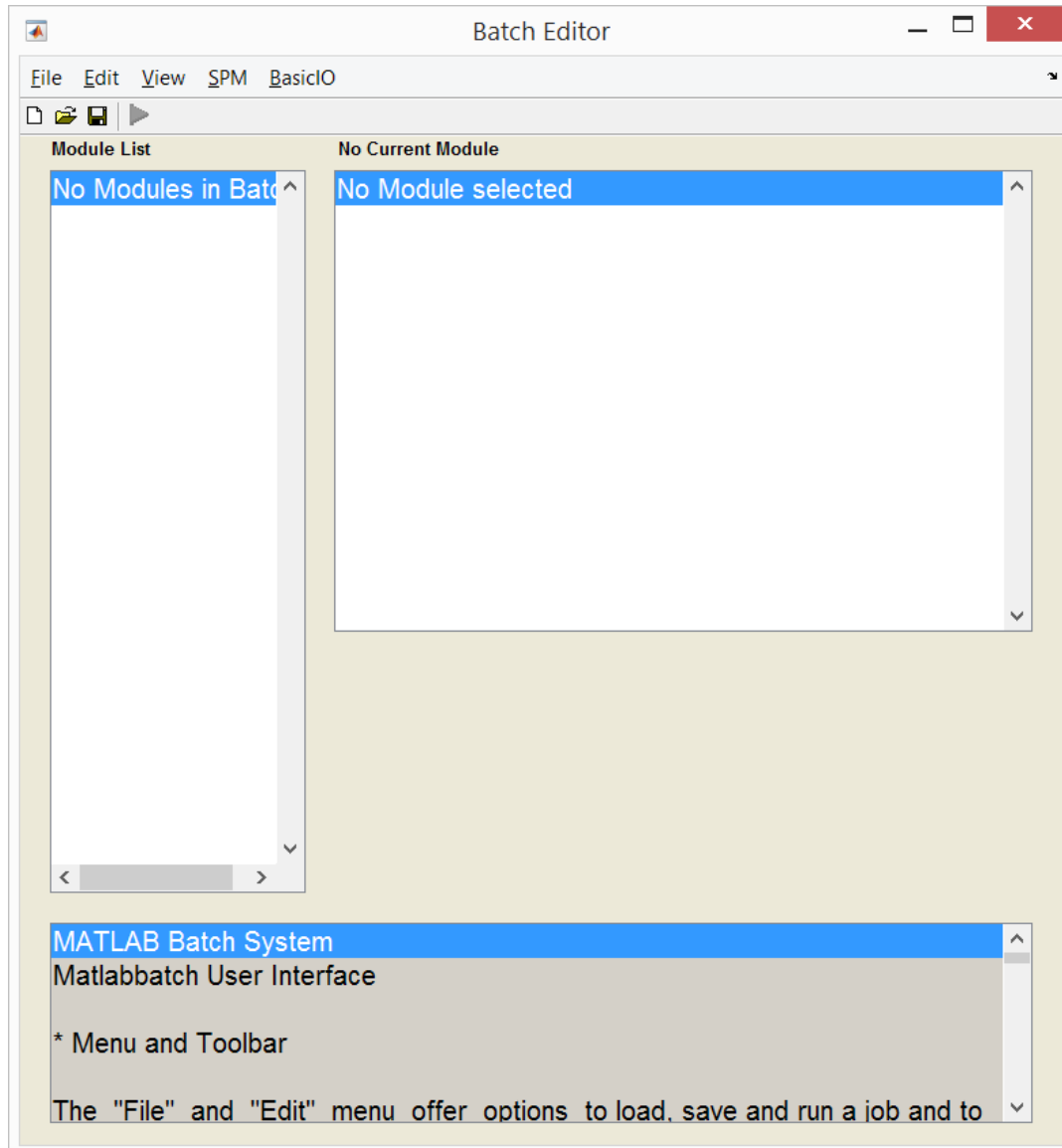
Example: Threshold anatomy ...

# ImCalc

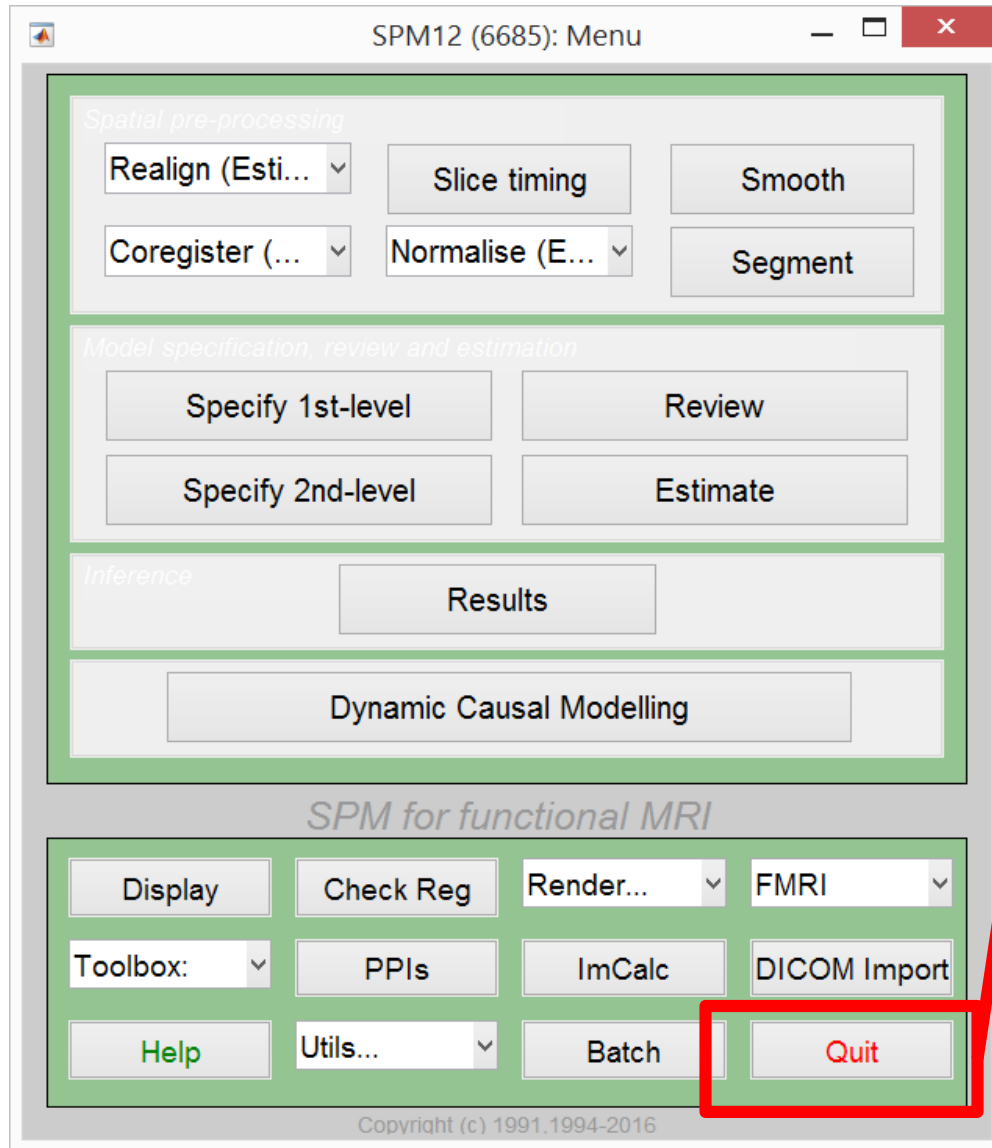


Start the batch editor. Often the batch editor also starts, if one clicks on one of the other buttons.

# The batch editor



# Quitting spm



Exit spm.

# A simple example – thresholding anatomy

The screenshot shows the 'Batch Editor' window with the 'Image Calculator' module selected. The interface includes a menu bar (File, Edit, View, SPM, BasicIO), a toolbar, and a 'Module List' on the left. The main area displays the configuration for the 'Image Calculator' module, including input images, output filename, and a logical expression for thresholding. The expression '(i1>75)&(i1<105)' is highlighted in blue. Below the main configuration, there is a 'Current Item: Expression' section with a text box containing the same expression and a 'Specify...' button. At the bottom, an 'Expression' section provides example expressions and their descriptions.

Batch Editor

File Edit View SPM BasicIO

Module List

Image Calculator

Current Module: Image Calculator

Help on: Image Calculator

Input Images ...2016\face\_rep\Structural\sM03953\_0007.img, 1

Output Filename GreyFromThreshold

Output Directory

Expression (i1>75)&(i1<105)

Additional Variables

Options

- . Data Matrix No - don't read images into data matrix
- . Masking No implicit zero mask
- . Interpolation Trilinear
- . Data Type INT16 - signed short

Current Item: Expression

(i1>75)&(i1<105)

Specify...

Expression

Example expressions (f):

- \* Mean of six images (select six images)  
f = '(i1+i2+i3+i4+i5+i6)/6'
- \* Make a binary mask image at threshold of 100  
f = 'i1>100'

# Preparation for tutorials (if you want to follow on your own laptop, optional)

- Install matlab via your university.
- Download spm (<http://www.fil.ion.ucl.ac.uk/spm/software/spm12/>) and add to Matlab path.
- Download dataset face\_rep.zip from [http://www.fil.ion.ucl.ac.uk/spm/data/face\\_rep/](http://www.fil.ion.ucl.ac.uk/spm/data/face_rep/)
- Download [face\\_rep\\_spm12\\_batch.m](#) from the same source.
- Extract the data in a folder on your computer. Within the face\_rep folder create a folder called «batches».