

# fMRI Experimental Design

## Tools

- Chris Rorden **fMRI Simulator**: <http://www.mccauslandcenter.sc.edu/CRNL/tools/fmrism>
- **optseq2** is a tool for automatically scheduling events for rapid-presentation event-related (RPER) fMRI experiments (the schedule is the order and timing of events):  
<http://surfer.nmr.mgh.harvard.edu/optseq/>

Good explanation about optseq and event-related designs:

<http://andysbrainblog.blogspot.de/2012/09/optseq-and-event-related-designs.html>

- **RSFgen** is a AFNI tool for paradigm design:  
[http://afni.nimh.nih.gov/pub/dist/doc/program\\_help/RSFgen.html](http://afni.nimh.nih.gov/pub/dist/doc/program_help/RSFgen.html)
- **make\_random\_timing.py** is a AFNI tool to define multiple events, their responses and their time series: [http://afni.nimh.nih.gov/pub/dist/doc/program\\_help/make\\_random\\_timing.py.html](http://afni.nimh.nih.gov/pub/dist/doc/program_help/make_random_timing.py.html)
- **3dDeconvolve** is a AFNI tool to evaluate the power of each experimental design:  
[http://afni.nimh.nih.gov/pub/dist/doc/program\\_help/3dDeconvolve.html](http://afni.nimh.nih.gov/pub/dist/doc/program_help/3dDeconvolve.html)

AFNI background experimental design:

[http://afni.nimh.nih.gov/pub/dist/HOWTO/howto/ht03\\_stim/html/stim\\_background.html](http://afni.nimh.nih.gov/pub/dist/HOWTO/howto/ht03_stim/html/stim_background.html)

[http://afni.nimh.nih.gov/pub/dist/edu/2007\\_02\\_korea/pdfs/ExptDsgn.pdf](http://afni.nimh.nih.gov/pub/dist/edu/2007_02_korea/pdfs/ExptDsgn.pdf)

[http://afni.nimh.nih.gov/pub/dist/HOWTO/howto/ht03\\_stim/html/AFNI\\_howto.html](http://afni.nimh.nih.gov/pub/dist/HOWTO/howto/ht03_stim/html/AFNI_howto.html)

## Theory

K. J. Friston, E. Zarahn, O. Josephs, R. N. A. Henson, A. M. Dale (1999) Stochastic Designs in Event-Related fMRI, *NeuroImage*, 10: 607-619. PMID: 10547338

<http://www.ncbi.nlm.nih.gov/pubmed/%2010547338> friston1999\_stochastic\_designs\_in\_event-related\_fmri.pdf

Design efficiency in fMRI: <http://imaging.mrc-cbu.cam.ac.uk/imaging/DesignEfficiency>

MIT imaging library: <http://web.mit.edu/swg/imaginglibrary.htm>

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