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ESPS Peer-review Report
Name of Journal: World Journal of Radiology
ESPS Manuscript NO: 8642
Title: Recent developments in optimal experimental designs for functional MRI
Reviewer code: 02673096
Science editor: Ling-Ling Wen
Date sent for review: 2013-12-31 21:33
Date reviewed: 2014-01-20 13:41

CLASSIFICATION	LANGUAGE EVALUATION	RECOMMENDATION	CONCLUSION
[ ] Grade A (Excellent)	[Y] Grade A: Priority Publishing	Google Search:	[Y] Accept
[Y] Grade B (Very good)	[ ] Grade B: minor language polishing	[ ] Existed	[ ] High priority for publication
[ ] Grade C (Good)	[ ] Grade C: a great deal of language polishing	[ ] No records	
[ ] Grade D (Fair)		BPG Search:	[ ]Rejection
[ ] Grade E (Poor)	[ ] Grade D: rejected	[ ] Existed	[ ] Minor revision
		[ ] No records	[ ] Major revision

COMMENTS TO AUTHORS

This is a good review to survey experimental designs for functional magnetic resonance imaging experiments.

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ESPS Peer-review Report
Name of Journal: World Journal of Radiology
ESPS Manuscript NO: 8642
Title: Recent developments in optimal experimental designs for functional MRI
Reviewer code: 01569646
Science editor: Ling-Ling Wen
Date sent for review: 2013-12-31 21:33
Date reviewed: 2014-01-23 04:12

CLASSIFICATION	LANGUAGE EVALUATION	RECOMMENDATION	CONCLUSION
[ ] Grade A (Excellent)	[ ] Grade A: Priority Publishing	Google Search:	[ ] Accept
[ ] Grade B (Very good)	[Y] Grade B: minor language polishing	[ ] Existed	[ ] High priority for publication
[ ] Grade C (Good)	[ ] Grade C: a great deal of language polishing	[ ] No records	[Y]Rejection
[Y] Grade D (Fair)	[ ] Grade D: rejected	BPG Search:	[ ] Minor revision
[ ] Grade E (Poor)		[ ] Existed	[ ] Major revision
		[ ] No records	

COMMENTS TO AUTHORS

This is quite a technical review. Unfortunately I did not see the practical application of separating the estimation of the HRF function from detection of brain activations, and I could not see how estimation of the HRF helps to make inferences about duration of brain activation. Quotation from the paper are below to emphasize my point. "In the fMRI literature, dual models are commonly considered for two popular study objectives, namely the detection of brain activations (or detection) and the estimation of the HRF (or estimation)." I am not aware of any studies that endeavour to estimate the HRF function without also attempting to detection brain activations. Estimation of the HRF function is carried out to attempt to detect brain activations without being restricted by assumptions about the shape of the HRF. HRF estimation and detection do not seem to be two separable objectives. In other words, detection involves detection of brain activations when the HRF shape is assumed, and estimation involves detection of brain activation when the HRF shape is not assumed. That is, Equation 1 should be considered a special case of Equation 2, where the shape of the HDR is assumed in Equation 1 only. "The estimation of the HRF helps to make inference about some characteristics of the underlying neuronal activity such as the response time to each brief stimulus or the duration of brain activation[14]." Since neuronal activity takes place on the scale of 50 or 100 ms events, and the HRF takes place on the scale of 5-10 seconds, it seems very unlikely that the HRF can be used to make inferences about duration of brain activation. "Here, T_ISI is the pre-specified inter-stimulus interval (e.g., 4 seconds) that is greater than the presentation duration of each stimulus." Why must the ISI be greater than the presentation duration of the stimulus? This is not always the case. Some designs use a combination of short and long ISIs (see Serences Neuroimage

2004;21:1690-1700). "The ith element of d corresponds to time (i - 1)T_ISI , and time 0 may be synchronized to the first valid MRI scan." Why does an element of d, which represents a stimulus, correspond to the time of an ISI? Say ISI is 4 seconds. The 12th element of d corresponds to time (12-1)*4 = 44. This is not clear an example is needed.

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ESPS Peer-review Report
Name of Journal: World Journal of Radiology
ESPS Manuscript NO: 8642
Title: Recent developments in optimal experimental designs for functional MRI
Reviewer code: 02158063
Science editor: Ling-Ling Wen
Date sent for review: 2013-12-31 21:33
Date reviewed: 2014-03-06 14:59

CLASSIFICATION	LANGUAGE EVALUATION	RECOMMENDATION	CONCLUSION
[ ] Grade A (Excellent)	[Y] Grade A: Priority Publishing	Google Search:	[Y] Accept
[Y] Grade B (Very good)	[ ] Grade B: minor language polishing	[ ] Existed	[ ] High priority for publication
[ ] Grade C (Good)	[ ] Grade C: a great deal of language polishing	[ ] No records	
[ ] Grade D (Fair)		BPG Search:	[ ]Rejection
[ ] Grade E (Poor)	[ ] Grade D: rejected	[ ] Existed	[ ] Minor revision
		[ ] No records	[ ] Major revision

COMMENTS TO AUTHORS

This review article introduces recent experimental designs for fMRI and the authors proposes a new optimal design based on their previous work. The article is well written and I think it is suited to the readership of the journal.