NEUROIMAGING SEMINAR SERIES TOLMAN 5101 MONDAYS 4-6PM

SPRING 2010

Contacts

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Neuross mailing list questions – Ben Inglis binglis@berkeley.edu
Imaging Analysis clinic questions to be sent to: Matthew Brett matthew.brett@gmail.com
Imaging Acquisition Q&A questions to be sent to: Ben Inglis binglis@berkeley.edu

Mon 18 Jan	Holiday	
Mon 25th Jan	4.10pm Intro/The new format 4.30pm Bunge lab 5.15pm Bishop lab	
Mon 1st Feb	Brain Imaging Centre Ben Inglis (4.10pm): Any issues/updates/ fMRI acquisition Q&A Ben Inglis (4.40pm): Imaging acquisition current talking points 1*	
Mon 8th Feb	4.10pm Knight lab 5.00pm Matthew Brett Imaging Analysis Clinic	HWNI recruitment
Mon 15th Feb	Holiday	
Mon 22nd Feb	4.10pm Gallant lab 5.00pm Silver lab	
Mon 1st March	4.10pm D'Esposito lab 5.00pm Matthew Brett Imaging Analysis Clinic	HWNI recruitment
Mon 8th March	Brain Imaging Centre Ben Inglis (4.10pm): Any issues/updates/ fMRI acquisition Q&A Ben Inglis (4.40pm): Imaging acquisition current talking points 2*	
Mon 15th March	4.10pm Whitney lab 5.00pm Jagust lab	
Mon 22ndMarch	Holiday	
Mon 29th March	4.10pm Matthew Brett 'Intro to Neuroimaging in Python' 5.10pm David Feinberg 'The Ins and Outs of Echo Planar Imaging'	
Mon 5th April	Brain Imaging Centre Ben Inglis (4.10pm): Any issues/updates/ fMRI acquisition Q&A Ben Inglis (4.40pm): Imaging acquisition current talking points 3*	
Mon 12th April	4.10pm Sri Nagarajan, UCSF TBA 5.10pm Shimamura lab	
Mon 19th April	4.10pm Kring lab 5.00pm Ivry lab	
Mon 26th April	4.10pm Hsu lab 5.00pm Matthew Brett Imaging Analysis Clinic	
Mon 3rd May	VSS practice talks/posters	

*For details of the new BIC sessions **(and Matthew's Imaging Analysis Clinic)** please see overleaf

BIC sessions . Ben Inglis has kindly agreed to lead new monthly BIC sessions.

The first half hour will be a monthly update on things you might very well want to know if scanning at the BIC – so please do try to come to these if nothing else! E.g. If there is a change in sequences available or other things we will try to broadcast it here. As an example, in the first session (Feb 1st) Ben will be talking about when to /when not to (1) use grappa and (2) use the auto align. We will try and minute this part and post it to the Scanners 3T list but as always you're likely to get a fuller understanding if you come and hear what's up in person. This is also a time for which you can send in your burning acquisition / sequence questions and Ben will try to address them in a bit of a parallel to Matthew Brett's imaging analysis clinic.

Imaging acquisition current talking points
These are 1hr1/2 sessions covering important issues in imaging acquisition. Ben will send out 'pre-reading' each week. The discussion will be helped a lot if people can read this ahead of time and Ben may even sneakily make it part of a new users test sometime this Semester – so be warned!

The topics are as follows:

1st Feb.
We, and most of the rest of the world, use EPI for fMRI. Some labs use a spiral scan, however. What are the principal differences between spiral and EPI, and what are the pros and cons of the two approaches?

(We will discuss the origins of the k-space representation, using k-space diagrams to understand individual sequences and how k-space diagrams provide a convenient, intuitive way to compare pulse sequences.)

Mar 8th.
Echo planar imaging (EPI) is used for fMRI because it is fast; a single 2D plane can be acquired in about 30 ms and a set of 2D slices sufficient to cover an adult brain can be acquired in under 2 seconds with 4 mm voxels. But speed comes at a price. Explain the principal image artifacts that affect EPI and explain how and why the artifacts arise. What steps might you take to minimize each type of artifact?

(We will build on the previous seminar and use k-space diagrams to discuss EPI acquisition approaches including parallel imaging such as GRAPPA, partial Fourier EPI, image blurring, image distortion, image dropout and motion artifacts.)

Apr 5th.
Everybody knows that BOLD is a "low-pass filtered" signal temporally, with BOLD peaking some five seconds after neural activity. But what about the spatial properties of vascular changes? What is the likely spatial response limit of fMRI, using vascular measures such as BOLD, cerebral blood flow (CBF) or cerebral blood volume (CBV)? How are the spatial and temporal responses related?

(We will discuss the inherent point spread function of physiological responses (especially BOLD), the layer and column organization of the cortex and its vascular supply, the spatio-temporal features of vascular compartments from arteries through capillaries to veins, and pulse sequences that can detect changes in the different vascular compartments separately.)

Matthew Brett's Imaging Analysis Clinic. Send in your sticky analysis questions/problems ahead of time and Matthew will address them in this session and post the answers to the wiki.