

fMRI Image Acquisition and Analyses Course with SPM and ICA

July 27th – 29th, 2012

Course Faculty: **Kent A. Kiehl, Ph.D.** &
Vince D. Calhoun, Ph.D.

The nonprofit Mind Research Network (MRN) &
The University of New Mexico

&

Tor Wager, Ph.D.

University of Colorado, Boulder

Website:

<http://mialab.mrn.org/courses/index.html>

Location:

Conference Center
The Mind Research Network
1101 Yale Blvd NE
Albuquerque, NM 87106

| Day 1: Fri, July 27th | | | | |
|---|----------|----------|---|-----------------------|
| | Start | Duration | | |
| | 7:15 am | 0:15 | Drivers will pick participants up from the Hyatt hotel lobby for transportation to the Mind Research Network building | |
| | 7:30 am | | Breakfast on-site | |
| Lect 1.1 | 8:00 am | 0:30 | Course Introduction | Kiehl, Calhoun, Wager |
| | 8:30 am | 1:00 | Virtual tour of MRI + acquisition of data; stimulus presentation; behavioral monitoring | Kiehl |
| | 9:30 am | 0:30 | Coffee Break | |
| Lect 1.2 | 10:00 am | 1:00 | fMRI pulse sequences, reconstruction; basic physics | Calhoun |
| | 11:00 am | 1:00 | SPM and Toolbox install – computer check | Wager |
| | 12:00 pm | 0:30 | Lunch (provided) | |
| Lect 1.3 | 12:30 pm | 1:00 | Intro to SPM; Data checking; Reorienting data | Kiehl |
| Lect 1.4 | 1:30 pm | 1:00 | Spatial Preprocessing: Realignment/ Slice Timing/ Unwarp/ | Kiehl |
| | 2:30 pm | 0:30 | Coffee Break | |
| Lect 1.5 | 3:00 pm | 1:00 | Spatial Preprocessing: Coregistration/ Spatial Normalization | Kiehl |
| Lect 1.6 | 4:00 pm | 0:30 | Spatial Smoothing | Kiehl |
| Lect 1.7 | 4:30 pm | 1:00 | General Linear Model I- Principles and fMRI | Wager |
| | 5:30 pm | 0:30 | Question/answer | Kiehl, Wager, Calhoun |
| | 6:00 pm | | Adjourn | |
| | | | Return participants to Hyatt | |
| Social Outing: 7:00 PM (The Elephant Bar Restaurant http://www.elephantbar.com) | | | | |

| Day 2: Saturday, July 28 | | | | |
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| | Start | Duration | | |
| | 7:15am | 0:15 | Drivers will pick participants up from the Hyatt hotel lobby for transportation to the Mind Research Network building | |
| | 7:30 am | | Breakfast on-site | |
| | 8:00 am | 1:00 | Review from Day 1 question and answer | Kiehl, Calhoun, Wager |
| Lect 2.1 | 9:00 am | 1:00 | General Linear Model II: Basis sets, autocorrelation, and filtering for fMRI | Wager |
| | 10:00 am | 0:30 | Coffee | |
| Lect 2.2 | 10:30 am | 1:00 | SPM GUI for Single Subject stats/explore design/scaling | Kiehl |
| | 11:30 pm | 0:30 | Lunch (provided) | |
| Lect 2.3 | 12:00 pm | 1:00 | General Linear Model III: Contrasts | Wager |
| Lect 2.4 | 1:00 pm | 1:00 | SPM Results: Single subjects; plotting; display | Kiehl |
| | 2:00 pm | 0:30 | Break; Coffee | |
| Lect 2.5 | 2:30 pm | 1:00 | Intro to connectivity and mediation | Wager |
| Lect 2.6 | 3:30 pm | 1:30 | Introduction to Independent Component Analysis | Calhoun |
| | 5:00 pm | 1:00 | Question/answer | Kiehl, Calhoun, Wager |
| | 6:00 pm | | Adjourn | |
| | | | Return participants to Hyatt | |
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| Day 3: Sunday, July 29 | | | | |
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| | Start | Duration | | |
| | 7:15am | 0:15 | Drivers will pick participants up from the Hyatt hotel lobby for transportation to the Mind Research Network building | |
| | 7:30am | | Breakfast on-site | |
| | 8:00 am | 0:30 | Review of Days 1-2 | Kiehl, Calhoun, Wager |
| Lect 3.1 | 8:30 am | 1:00 | Experimental Design – Blocked and event-related designs and efficiency | Wager Actually 1.5+ hours |
| Lect 3.2 | 9:30 am | 1:00 | Group analysis: Fixed, random, and mixed effects | Wager Actually 0:50 – 1:00 comfortably |
| | 10:30 am | 0:30 | Coffee Break | |
| Lect 3.3 | 11:00 am | 1:00 | SPM results – group subjects; plotting; display; small volume correction | Kiehl |
| | 12:00 pm | :30 | Lunch (provided) | |
| | 12:30 pm | 1:00 | Group analysis: Thresholding and inference | Wager |
| Lect 3.4 | 1:30 pm | 1:00 | Independent Component Analyses II: fMRI | Calhoun |
| | 2:30 pm | :30 | Coffee Break | |
| Lect 3.5 | 3:00 pm | 2:00 | ICA of fMRI: Implementation | Calhoun, Kiehl |
| | 5:00 pm | 1:00 | Review & Final Q and A | Kiehl, Calhoun, Wager |
| | 6:00 | | Adjourn | |
| | | | Return participants to Hyatt | |