

Term Information

Effective Term Autumn 2015

General Information

Course Bulletin Listing/Subject Area Psychology
Fiscal Unit/Academic Org Psychology - D0766
College/Academic Group Arts and Sciences
Level/Career Graduate
Course Number/Catalog 6650
Course Title Seminar in Advanced fMRI Analysis Techniques
Transcript Abbreviation Adv FMRI Analyses
Course Description This course is for students who have already completed the intro-level fMRI course. We will discuss techniques such as fMR-adaptation, retinotopic mapping, multi-voxel pattern analysis, functional connectivity, representational similarity analysis, real-time fMRI, etc. The format of the course will be seminar-style; we will discuss journal articles and experiment ideas applying these techniques.
Semester Credit Hours/Units Fixed: 3

Offering Information

Length Of Course 14 Week
Flexibly Scheduled Course Never
Does any section of this course have a distance education component? No
Grading Basis Letter Grade
Repeatable Yes
Allow Multiple Enrollments in Term No
Max Credit Hours/Units Allowed 15
Max Completions Allowed 5
Course Components Seminar
Grade Roster Component Seminar
Credit Available by Exam No
Admission Condition Course No
Off Campus Never
Campus of Offering Columbus

Prerequisites and Exclusions

Prerequisites/Corequisites Prereq: Psych 5425 or permission of instructor. This course is intended for students with prior fMRI experience.

Exclusions

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code 42.0101
Subsidy Level Doctoral Course
Intended Rank Masters, Doctoral

Requirement/Elective Designation

The course is an elective (for this or other units) or is a service course for other units

Course Details

Course goals or learning objectives/outcomes

- Students will learn:
 1. Basic principles of different types of fMRI analysis techniques.
 2. How to read and critically evaluate journal articles using these techniques.
 3. How to design experiments that can make use of these techniques etc

Content Topic List

- Multi-voxel pattern analysis
- Retinotopic mapping
- Functional connectivity

Attachments

- Psych 6650 syllabus.docx: syllabus
(Syllabus. Owner: Paulsen, Alisa Marie)

Comments

- Please note that the prerequisite course, Psych 5425, is currently pending approval. *(by Paulsen, Alisa Marie on 06/05/2014 11:00 AM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Paulsen, Alisa Marie	06/05/2014 03:13 PM	Submitted for Approval
Approved	Vasey, Michael William	06/05/2014 04:11 PM	Unit Approval
Approved	Haddad, Deborah Moore	06/05/2014 04:49 PM	College Approval
Pending Approval	Vankeerbergen, Bernadette Chantal Nolen, Dawn Jenkins, Mary Ellen Bigler Hogle, Danielle Nicole Hanlin, Deborah Kay	06/05/2014 04:49 PM	ASCCAO Approval

Psych 6650: Advanced fMRI Analysis Techniques

Fall 2015

Instructor: Prof. Julie Golomb (golomb.9@osu.edu)

LZ 201 – office hours by appointment

Class Time:

Location:

Course Description:

This course is for students who have already completed an intro-level fMRI course. We will discuss a range of intermediate/advanced fMRI issues and analysis techniques, such as fMR-adaptation, retinotopic mapping, multi-voxel pattern analysis, functional connectivity, representational similarity analysis, real-time fMRI, etc. Discussions may also include topics such as comparing analysis software packages, pre-processing decisions, and interpretation of fMRI data. The format of the course will be seminar-style; we will read and discuss papers using each technique, and brainstorm how to apply and improve them in our own experiments.

Prerequisites and Enrollment Information:

Prereqs: Introduction to fMRI (Psych 5425) or permission of instructor. This course is intended for students with prior fMRI experience.

Course Resources:

Recommended Textbook: Poldrack, R.A., Mumford, J.A., Nichols, T.E. (2011). *Handbook of Functional MRI Data Analysis*. Cambridge University Press.

(Ebook available through <http://osu.worldcat.org/>)

Other helpful fMRI resources:

- Huettel, S.A., Song, A.W., McCarthy, G. (2008). *Functional Magnetic Resonance Imaging (2nd ed)*. Sinauer Associates.
- www.fMRI4newbies.com
- <http://fsl.fmrib.ox.ac.uk/fslcourse/>
- <http://www.brainvoyager.com/bvresources/documentation/documentation.html>

Additional readings from the primary literature will be provided on CARMEN.

Website: All course materials and information will be made available on CARMEN (<https://carmen.osu.edu/>).

Course Structure:

The course will meet once a week, from 2:15-5pm (with a 15min break in the middle).

The first few weeks will begin with some lectures to get everyone up to speed and introduce some of the basic analyses to be discussed throughout the rest of the course. We'll also have some group discussions / demos comparing different software packages. One of the challenges with fMRI is that everyone seems to use different analysis packages. This is a way for you guys to share your expertise with each other, and gain an understanding of how different packages work and the differences between them.

The remainder of the course will be primarily seminar / discussion format. Each week will have 2-3 "presentations", split between journal club style discussions and research idea presentations. Each student must lead one session of each type.

Journal Club: Each week we will discuss 1-2 papers describing or using different fMRI analysis techniques. Each student will be responsible for leading one journal club discussion. The leader will select the paper in advance (consulting with me) and will be in charge of leading the discussion for the day. *Everyone is expected to read each paper and contribute to the discussions.* The leader may wish to prepare a brief summary and/or discussion points to facilitate discussion. Papers may be "classic" papers introducing a particular technique, recent experimental papers applying a technique to any topic of interest, or methods papers discussing or comparing methodological considerations for a given technique(s).

Oral Presentations: Each student will also give a brief presentation introducing an experiment idea that applies one of the discussed "advanced" techniques to their research interests. This can be a real experiment the student is planning to run or a thought experiment. The presenter should prepare a brief (~20min) powerpoint introducing the research question and the proposed experiment, along with some hypothetical outcomes. The rest of the class will provide constructive feedback during discussion.

Grading:

35% Class participation

15% Leading of journal club discussion

20% Oral Presentation: Research idea applying an analysis technique

30% Written Assignment: Project proposal (3-5 pages double-spaced). This should be written in the style of a mini grant or fellowship proposal (e.g., NSF GRF). There should be sufficient background/introduction to understand and motivate the question, a description of the proposed experiment (design, methods, fMRI analyses), and a discussion of possible outcomes and significance. The proposed experiment should make use of one of the analysis techniques covered in class. Students are encouraged to incorporate feedback from the class from their oral presentation.

Grading Scale: Standard OSU grade scheme (93-100% = A; 90-92.9 = A-; 87-89.9=B+; etc)

Attendance policy:

Students are expected to attend and participate in every class. Students with repeated unexcused absences will have the participation component of their grade docked accordingly.

Tentative Class Schedule:

<u>Week</u>	<u>Date</u>	<u>Topic</u>
Week 1	Aug 21 st	Welcome/Intro Planning
Week 2	Aug 28 th	Lecture 1: “Pre-analysis” decisions Discussion / small group demos: Comparing software packages
Week 3	Sept 4 th	Lecture 2: Standard fMRI analysis issues Discussion / small group demos: Comparing software packages
Week 4	Sept 11 th	Lecture 3: Overview of “Advanced” Analysis Techniques Lecture 3 cont’d
Week 5	Sept 18 th	Journal club presentation Journal club presentation Oral presentation
Week 6	Sept 25 th	Journal club presentation Journal club presentation Oral presentation
Week 7	Oct 2 nd	Journal club presentation Journal club presentation Oral presentation
Week 8	Oct 9 th	Journal club presentation Journal club presentation Oral presentation
Week 9	Oct 16 th	Journal club presentation Journal club presentation Oral presentation
Week 10	Oct 23 rd	Journal club presentation Oral presentation Oral presentation
Week 11	Oct 30 th	Journal club presentation Oral presentation Oral presentation
Week 12	Nov 6 th	Journal club presentation Oral presentation Oral presentation
Week 13	Nov 13 th	Journal club presentation Oral presentation Oral presentation
Week 14	Nov 20 th	Oral Presentation Wrap-up discussion / Group JC (Future of fMRI)
<i>Final Papers due Dec 4th</i>		

Academic Misconduct:

“It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct http://studentlife.osu.edu/pdfs/csc_12-31-07.pdf.”

Disability Services:

“Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; <http://www.ods.ohio-state.edu/>.”