Advanced Neuroimaging: Fundamentals and Methods

Topics: Functional MRI (fMRI), Diffusion and DTI, Perfusion, DCE, and Spectroscopy

May 24th, 2014 8:30-6PM
Baldwin Auditorium
Northwestern University, Chicago IL

Course Director: Todd Parrish, PhD

To register and for more information: www.neuroimaging.northwestern.edu/seminar

Program Description:

This interesting all-day lecture series provides the fundamentals needed to understand advanced neuroimaging methods. Topics include imaging physics, functional MRI (acquisition, stimulus presentation, experiment design, data analysis, and interpretation), perfusion imaging (ASL, DSC, and DCE), diffusion imaging (analysis and tractography), and MR spectroscopy. Emphasis will be placed on the clinical application for all of the methods discussed.

Who should attend?

Any Physician, Neuroscientist, or MR Technologist looking to gain a strong foundation in advanced neuroimaging methods using MRI will benefit from this series. The lectures focus on the physics, physiology, and neuroscience behind the methods to provide a clearer understanding of these powerful techniques. There will not be any training on specific post-processing software or scanner hardware used for advanced neuroimaging. Instead a general understanding will be the goal.

Seminar Fee: $100 for Students; $200 for PhD, MD, Tech. Discounted parking available.

Course Director:
Todd Parrish, PhD; Professor, Department of Radiology, Northwestern University

Faculty:
Darren Gitelman, MD; Associate Professor, Department of Neurology, Northwestern University
Jennie Chen, PhD; Assistant Professor, Department of Radiology, Northwestern University
Xue Wang, PhD; Assistant Professor, Department of Radiology, Northwestern University
Tom Gallagher, MD; Assistant Professor, Department of Radiology, Northwestern University
Schedule:
07:30 – 08:30 Registration and Coffee
08:30 – 09:30 Imaging physics and functional physiology – Todd Parrish
09:30 – 10:30 Neuro & Functional Anatomy & Connectivity – Darren Gitelman

Break
10:45 – 11:45 fMRI Paradigm and Experimental Design – Darren Gitelman

Lunch on your own
12:30 – 01:30 Issues related to clinical fMRI – Todd Parrish
01:30 – 02:30 Perfusion Imaging – Jennie Chen

Break
02:45 – 03:45 Diffusion Imaging – Xue Wang
03:45 – 04:30 Physics of MR spectroscopy – Todd Parrish
04:30 - 05:30 Putting it all into a Clinical Perspective – Tom Gallagher

Program Objectives

- To obtain an understanding of the underlying anatomy, physiology, and cognitive networks being assessed with the advanced neuroimaging methods.
- To gain general knowledge of experimental design, implementation of fMRI experiments, and analysis methods used in neuroscience research studies.
- Learn to conduct functional MRI, perfusion, diffusion and spectroscopy studies with knowledge of imaging physics, physiologic limitations, data analysis issues, and proper interpretation in the context of pathology.
- To obtain an understanding of the underlying anatomy, physiology, and cognitive networks being assessed with the advanced neuroimaging methods.