Bioengineering Seminar

by Faculty Candidate

Friday, March 2nd, 2012

11:00 AM, Room 3507

Nguyen Engineering Building

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Associate Professor,
Department of Radiology at UTHSCSA

Identifying spatial topography and intrinsic connectivity of functional brain networks via neuroimaging and neuroinformatics techniques

Human functional magnetic resonance imaging (fMRI) is an experimental discipline that establishes structure-function correspondences in the brain through the interdisciplinary application of principles from physics and engineering, statistics, biology,medicine, and psychology.

In the last two decades, research in fMRI has resulted in a massive amount of data intended to spatially localize the neural regions engaged during specific mental operations (e.g., perception, action, cognition, emotion and autonomic functions). I will describe new advances in fMRI data analysis methods that allow identification of the spatial topography and functional parcellation of distinct brain regions, as well as techniques for assessing the functional and effective connectivity between these regions.

I will also discuss resting state fMRI studies that provide insight into large-scale intrinsic connectivity networks and the functional organization of the human brain. Lastly, I will present recent results demonstrating the use of data mining techniques to provide functional explication of these intrinsic connectivity networks.

BIOGRAPHY

Dr. Laird received her B.S. in Physics from Florida State University in 1998, and her Ph.D. in Physics/Medical Physics from the University of Wisconsin-Madison in 2002. Her dissertation focused on the development of nonlinear analysis techniques applied to functional magnetic resonance imaging data. In 2005, Dr. Laird completed a postdoctoral fellowship under the direction of Dr. Peter Fox at the Research Imaging Institute of the University of Texas Health Science Center San Antonio (UTHSCSA). She is currently an Associate Professor in the Department of Radiology at UTHSCSA.

Dr. Laird's research program falls within the general domain of biomedical imaging analysis and informatics, and focuses on developing algorithms for quantifying and modeling the temporal and spatial dynamics of human brain networks using fMRI. Specifically, her work aims to understand the functional organization of large-scale brain networks by developing novel data analysis and data mining methods, neuroscience informatics tools, and neuroimaging ontologies.

Her overall research goal is to develop strategies for improving investigations into functional brain networks of healthy individuals, as well as in populations with psychiatric and neurologic diseases and disorders.

For any questions please contact Claudia Borke at cborke@gmu.edu, (703) 993-4190