Neuroimaging Meta-Analysis

Organizers:
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Functional neuroimaging has provided a wealth of information on the cerebral localization of mental functions. In spite of its success, however, several limitations restrict the knowledge that may be gained from each individual experiment. These include a usually rather small sample size, limited reliability of an indirect signal like BOLD fMRI and the need to base inference on relative contrasts between conditions. Such limitations have raised some concerns on the interpretability and validity neuroimaging results, but have also encouraged the development of quantitative meta-analysis approaches. Neuroimaging meta-analysis is used to summarize a vast amount of research findings across a large number of participants and diverse experimental settings. Such integration then enables statistically valid generalizations on the neural basis of psychological processes in health and disease. They also permit comparisons of different tasks or processes to each other and the modeling of interacting networks. Quantitative meta analysis therefore represents a powerful tool to gain a synoptic view of distributed neuroimaging findings in an objective and impartial fashion, addressing some of the limitations raised above. The purpose of this course is to review the theory and practice of meta-analytic modeling and database-driven syntheses. In order to provide a comprehensive overview, this course spans both basic and advanced topics and addresses practical tips and tools to conduct meta-analytic studies in psychological and clinical applications. This broad coverage will thus provide both a deeper understanding of the methodological underpinnings as well as concrete ideas for how to apply meta analytic techniques to advance brain science.

Course Schedule:

13:00-13:20
Foundations and potential of meta-analyses
Peter Fox, University of Texas Health Science Center at San Antonio, San Antonio, TX, United States

13:20-13:40
How to Plan and Prepare a Meta-Analysis
Felix Hoffstaedter, Research Centre Jülich, INM-1, Jülich, Germany

13:40-14:00
Overview on Meta-Analysis methods
Thomas Nichols, University of Warwick, Coventry, United Kingdom

14:00-14:20

ALE and BrainMap

Angie Laird, Florida International University, Miami, FL, United States

14:20-14:40

MKDA and Neurosynth

Tal Yarkoni, *University of Texas at Austin, Austin, United States*

14:40-15:10

Break

15:10-15:30

Practical Intensity Based Meta-Analysis

Camille Maumet, University of Warwick, Coventry, United Kingdom

15:30-15:50

Co-activation mapping and parcellation

Sarah Genon, Jülich Research Centre, Jülich, Germany

15:50-16:10

Inferring mental states from imaging data: OpenfMRI and the Cognitive Atlas

Russell Poldrack, Stanford University, Stanford, CA United States

16:10-16:30

Questions and Answer