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Subject-level Functional Neuroimaging for Personalized Medicine

A major obstacle for exploring subtle aspects of network organization and translating insights into clinical applications is the lack of tools for mapping networks in individual subjects. We evaluated inter-subject variability in brain functional organization and developed novel subject-level functional imaging tools to accurately map functional regions using resting-state fMRI and task-based fMRI. These subject-specific functional neuroimaging techniques may replace the invasive pre-surgical functional mapping routines currently in use, and lead to personalized targets to treat a variety of neurological and psychiatric disorders.

Biography

Hesheng Liu is SmartState Chair Professor of Neuroscience at the Medical University of South Carolina and Associate Professor of Radiology at Harvard Medical School. His research focuses on developing novel neuroimaging and computational tools to reveal brain functional architecture in individual subjects. A major goal of his work is to localize functional networks in individual patients to guide surgical intervention. Another theme in his lab is to identify personalized neuromodulation targets for brain disorders and study functional changes in individual patients after neuromodulation treatments.