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The Human Brainnetome Atlas and its Applications in Understanding of Brain Functions and Disorders

The Human Brainnetome atlas is constructed with brain connectivity profiles obtained using multimodal magnetic resonance imaging. It is in vivo, with fine-grained brain subregions, and with anatomical and functional connection profiles. In this lecture, we will summarize the advance of the human brainnetome atlas, its biological basis and practical applications in neuroscience and brain diseases. We first present the basic ideas of the human brainnetome atlas and the procedure to construct this atlas. Then some parcellation results of the human brain areas with different types of cytoarchitectures will be provided. After that, we will present the biological basis of the brainnetome atlas from aspects of genetics, evolution, and relationships between structure and functions of the brain. Next, we will show how to use the human brainnetome atlas in practice to address issues in cognitive neuroscience and clinical research. Finally, we will give a brief perspective on multiscale brainnetome atlas and the related neurotechniqes.

Biography

Professor Tianzi Jiang is Director of Beijing Key Laboratory of Brainnetome and Director of the Brainnetome Center at the Institute of Automation of the Chinese Academy of Sciences (CASIA), and Chief Professor at University of the Chinese Academy of Sciences. He is also a ChangJiang Professor at University of Electronic Science and Technology of China and Professor at Queensland Brain Institute, University of Queensland, Australia. His research interests include neuroimaging, Brainnetome, imaging genetics, and their clinical applications in brain disorders. He is the author or co-author of over 300 reviewed journal papers in these fields, with a total citation of over 24000 from Google Scholar and H-index of 73. His study on the Human Brainnetome Atlas was ranked among the Top 10 Breakthroughs in Science and Technology of China in 2016. It was also ranked on the Top 10 Breakthroughs in Medicine of China in 2016, and was also selected as a part of 40 Milestone Achievements of the Chinese Academy of Sciences in the last 40 years (1978 -

2018). He was elected a member of the Academy of Europe, a fellow of the American Institute for Medical and Biological Engineering.