FUNCTIONAL BRAIN CONNECTIVITY ANALYSIS IN HUMAN CONNECTOME PROJECT DATA

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BIG DATA & NEUROIMAGING

As imaging technology improves, the amount of brain data increases.

Images of the human brain provide large amount of information.
HUMAN CONNECTOME PROJECT

5-year, $40-million initiative to map the human brain networks

Connectome is complex and poorly understood

Goal: solve complexity with new Magnetic Resonance Imaging (MRI) Technology
MEASURING FUNCTIONAL BRAIN CONNECTIVITY

- Functional Magnetic Resonance Imaging (fMRI)
- Resting-state fMRI
  - Blood-Oxygen-Level-Dependent (BOLD) Signal
Craddock et al, 2011

Allen, 2014
Stationary Functional Connectivity
PRIMARY SENSORY (VISUAL & MOTOR)
FRONTOTEMPORAL R/L LATERALIZATION
DEFAULT MODE NETWORK
Dynamic Functional Connectivity
Dynamic Functional Connectivity
OUTLOOK

• **Stationary Functional Connectivity**
  ➢ Less Clustering

• **Dynamic Functional Connectivity**
  ➢ Focus on a specific network
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SOURCES

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