

Functional Magnetic Resonance Imaging (fMRI) is one of the most widely used techniques for studying the human brain in action. With fMRI, we can obtain snapshots of roughly every second of signals related to brain activity and metabolism at about 320,000 locations across the brain, sampling the processes that enable us to perform any of the other thousands of mental activities that make us human. This course provides an overview of fMRI and the research community that has grown around it, comparing and comparing fMRI with other neuroimaging modalities. Further, it will discuss the types of inferences researchers have traditionally sought to make about mind, brain, and behaviour, providing background and terminology about the MR scanner and the generated signal and how to preprocess and understand fMRI data. Finally, it will cover the analysis needed to create brain maps, discuss how to understand brain networks including studies of functional and effective connectivity, as well as network analysis, and illustrate how fMRI data can be used to predict outcomes, classify participants, and create brain-based biomarkers.