

## **Graph-Theoretical Methods**

Methods from network science are revolutionizing the analysis of structural and functional neuroimaging data. The application of graph theoretical methods to morphometric gray matter networks, diffusion tractography networks, and fMRI-derived networks has led to numerous discoveries concerning cognition, health, and disease in the human brain. At present, the field is rapidly developing with an ever-expanding repertoire of quantitative network approaches. We will comprehensively review foundational principles in the application of graph theoretical methods to examine neuroimaging data. We will then discuss applications in structural networks, time-invariant functional networks, and dynamic functional networks. In particular, we will place an emphasis on characterizing brain networks at multiple scales of spatiotemporal organization, from the stable network roles of individual brain regions to time-varying brain-wide dynamics. To concretely illustrate the utility of these methods, we will highlight several impactful exemplars of their power to lead to novel discoveries in neuroimaging.