

Abstract

Study of multimodal brain imaging biomarkers of disease is frequently performed by analyzing each modality separately. In our work, we use a recently proposed regularization method, riPEER (ridge-identity partially empirical eigenvectors for regression), to discover early markers of HIV-associated outcomes including the neuropsychological measures. Specifically, we incorporate information arising from the structural connectivity in the penalized linear model framework to inform the associations between the brain cortical features and disease outcomes. Penalty term is defined as a Laplacian matrix arising from the structural connectivity adjacency matrix. We study the empirical behavior of the riPEER method via extensive simulation studies and apply it to the data collected on the HIV individuals at Washington University in St. Louis, USA.