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Carving Data at its Joint-ness: Towards Multimodal Neuroimaging Biomarkers

Abstract:

Prior studies have shown the advantages of leveraging multimodal data, such as brain structure and brain function, for the purposes of brain biomarker development or prediction. However, it can be challenging to combine or fuse high dimensional neuroimaging data. In this talk I will review approaches which focus on leveraging the joint information between modalities, including in cases where the data have mis-match dimensionality, such as with functional MRI which has a time dimension where structural MRI does not. I will then provide a few specific examples of some data fusion approaches and models that we have developed as well as their application to study psychiatric and neurological disorders. There is still much work to be done, but it is clear that we can improve our understanding of brain health and disorder by "carving data at its joint-ness" by leveraging the joint information only available by fusing multiple neuroimaging modalities.