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Yuehua Cui* (cuiy@msu.edu). *Omics data integration with kernel fusion*. Preliminary report.

High throughput omics data are generated almost with no limit nowadays. It becomes increasingly important to integrate different omics data types to disentangle the molecular machinery of complex diseases with the hope for better disease prevention and treatment. In this talk, I will briefly introduce the idea of kernel fusion for data integration. We focus on a fused kernel partial least squares (fKPLS) model for disease classification and prediction with multi-level omics data. The fused kernel can deal with effect heterogeneity in which different omic data types may have different effect contribution to the trait of interest. We optimize the kernel parameters and kernel weights with the genetic algorithm (GA). The proposed GA-fKPLS model can substantially improve disease classification performance by integrating multiple omics data types, demonstrated via simulation studies and real data analysis. (Received August 27, 2018)