



Tensor Methods for Omics Data Analysis

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Omics data is transforming into a multidimensional landscape, driven by advancements that enable the simultaneous acquisition of information from various sources. A critical factor in this evolution is the rise of multi-omics approaches, which integrate data across different molecular levels. Additionally, the concurrent analysis of multiple samples under various conditions has led to the development of multi-sample multi-condition datasets, emphasizing another layer of complexity in genomic data. The influx of intricate, multidimensional omics data presents new challenges and opportunities for analysis.

This presentation will introduce tensor methods as powerful analytical tools to address the complexities associated with these high-dimensional datasets. Tensors, which are multi-way arrays, extend traditional matrices into higher dimensions, allowing to capture multi-dimensional interactions among genomic variables such as genes, samples, conditions, and various omics platforms. We will cover the fundamentals of tensor algebra, including essential factorization techniques, and illustrate their applications in omics data analysis. This discussion will highlight their effectiveness in identifying gene expression modules, integrating multiple types of omics data, imputing missing values, and uncovering ligand-receptor interaction patterns.

Friday, March 7

4:00 pm

PS 307

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Zoom Meeting ID: 819 232 99449