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***Reverse Engineering Genome-scale Networks Using ML/AI***

**Abstract:**

Reverse engineering genome-scale networks from large-scale gene expression datasets and analyzing them to discover biological knowledge are important challenges in systems biology. While simpler models easily scale to large number of genes and gene expression datasets, more accurate models are compute-intensive limiting their scale of applicability. In this talk, I will present an overview of my group's research in network learning methods based on information theory, Bayesian networks, and deep learning, parallel algorithms to facilitate learning of large networks, and generating ensemble networks combining multiple approaches. The resulting networks can be used for predicting gene function and extracting context-specific subnetworks.