"Analyzing and learning from biological networks"

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Abstract:

Over the last decade, new technological advances have enabled us to deeply probe the inner workings of biological processes, and making sense of this data has raised several computational challenges. This data has also revealed how interacting molecules and cells make decisions, coordinate responses, and adapt to changing conditions under similar constraints as those faced by large distributed systems.

In this talk, I will first describe several methods for predicting condition-specific interactions missing in signaling pathways, for reconstructing ancestral biological networks, and for summarizing large, noisy graphs. In the second part, I will describe a joint computational-experimental approach to explore how neural networks in the brain form during development. I will discuss how the brain uses a very uncommon and surprising strategy to build networks and how this idea can be used to enhance the design and function of wireless communication networks.

Host: Gary Bader