



THE UNIVERSITY OF CHICAGO

COMPUTATIONAL AND APPLIED MATHEMATICS COLLOQUIUM

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Mathematical Biosciences Institute (MBI)
Ohio State University

Modeling by Networks

THURSDAY, May 10, 2018, at 5:00 PM
Jones 226, 5747 South Ellis Avenue

ABSTRACT

Networks consisting of nodes and unidirectional arrows encode systems of differential equations. The arrows indicate which nodes are coupled to which. The nodes and arrows can be annotated to indicate which nodes are identical and which kinds of coupling are identical. Our main point is that these types of annotated networks should be thought of as modeling assumptions. What distinguishes a coupled network of differential equations from a large system of differential equations is the desire to keep track of the output from each node individually. It is then possible to compare signals from different nodes (synchrony) and to keep track of singularities in individual nodes. The talk will focus on illustrating these ideas with two biological applications: binocular rivalry (based on Wilson networks) and homeostasis (in gene regulatory networks).



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