Simon Joyce (Binghamton)

Feedback Welcome: Structure of Boolean Gene Regulatory Networks

Abstract for the Combinatorics Seminar 2015 December 15

Signed directed graphs are often used as graphical representations of gene regulatory networks. Given a function f: $\{\pm 1\}^n \to \{\pm 1\}^n$, which may arise as representing the ways the activity levels of n mutually interacting genes vary with time, we derive a signed digraph, called the interaction graph of f, intended to model the regulatory network of the genes. I will discuss the structure of these interaction graphs.

Directed cycles in gene regulatory networks are sometimes called feedback loops. Time permitting, I will discuss properties of f that can be inferred from the cycle structure of the interaction graph.
