1080-92-366 **Yongwu Rong\*** (`rong@gwu.edu`), Department of Mathematics, George Washington University, Washington, DC 20052, and **Rahul Simha**, **Guanyu Wang** and **Chen Zeng**. *Dynamics and Topology of Boolean Networks.*

A Boolean network consists of a collection of units with a time-discrete dynamical system on two states. The interactions between the units are represented by the topology of a graph. An interesting problem is to study the connection between topology and dynamics of such networks. In particular, the so called reverse engineering problem asks for the topology of the network given information on its dynamics.

We focus on a specific Boolean network model arisen from the study of gene regulatory networks. Under this model, the reverse engineering problem is naturally related to the Satisfiability Problem. We show that (1) given information on dynamics, there is a polynomial time algorithm that determines if such a networks exists, and (2) the problem of finding a minimal such network is NP-hard. (Received January 31, 2012)