1090-92-5 **Alan Veliz-Cuba***, 203 Avery Hall, Lincoln, NE. *Reverse Engineering of Regulatory Networks Using Algebraic Geometry.*

Discrete models have been used successfully in modeling biological processes such as gene regulatory networks. When certain regulation mechanisms are unknown it is important to be able to identify the best model with the available data. In this context, reverse engineering of finite dynamical systems from partial information is an important problem. In this talk we will present a framework and algorithm to reverse engineer the possible wiring diagrams of a finite dynamical system from data. The algorithm consists in using an ideal of polynomials to encode all possible wiring diagrams, and choose those that are minimal using the primary decomposition. We will also show that these results can be applied to reverse engineer continuous dynamical systems. (Received October 08, 2012)