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**Brandilyn Stigler\*** (bstigler@smu.edu), 3200 Dyer Street, Dallas, TX 75275. *Using Groebner Bases to Characterize Data in Biological Network Inference*. Preliminary report.

Predicting mathematical models of biological phenomena from experimental data is sensitive to the amount of data used as input. When there are too few data, the number of possible models that explain the data are too numerous, thereby reducing the probability of selecting biologically relevant models. In the context of systems biology where substantial costs are incurred in laboratory experiments, having an estimate of the amount of data required to infer the network becomes important and aids in minimizing wasted resources.

In this talk, we introduce the problem of inferring networks from experimental data using a class of discrete models, called polynomial dynamical systems (PDSs). We show how Groebner bases can be used to detect which data sets will yield a unique PDS for a biological network of interest. In particular we describe how certain geometric properties of the associated monomial staircases reveal viable data sets. (Received January 19, 2016)