



FALL 2018

RENSSELAER POLYTECHNIC INSTITUTE

DEPARTMENT OF MATHEMATICAL SCIENCES COLLOQUIUM

“A bundled approach for high-dimensional informatics problems”

Abstract:

As biotechnologies for data collection become more efficient and mathematical modeling becomes more ubiquitous in the life sciences, analyzing both high-dimensional experimental measurements and high-dimensional spaces for model parameters is of the utmost importance. We present a perspective inspired by differential geometry that allows for the exploration of complex datasets such as these. In the case of single-cell leukemia data we present a novel statistic for testing differential biomarker correlations across patients and within specific cell phenotypes. A key innovation here is that the statistic is agnostic to the clustering of single cells and can be used in a wide variety of situations. Finally, we consider a case in which the data of interest are parameter sets for a nonlinear model of signal transduction and present an approach for clustering the model dynamics. We motivate how the aforementioned perspective can be used to avoid global bifurcation analysis and consider how parameter sets with distinct dynamic clusters contrast.

Speaker: Reginald McGee, College of the Holy Cross

September 24, 2018

4-5pm

Amos Eaton 214

Host: Isom Herron

Refreshments served 3:30-4pm Amos Eaton 4th Floor Lounge