

Mathematics Colloquium

Algebraic Design of Experiments

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Cal Poly

Friday, November 1, 2019
4:10 – 5 p.m.
Building 53 Room 206

Abstract

When molecular biologists perform experiments, they introduce perturbations whose effect they wish to test. However, since the outputs may happen to deviate from the expected, it is desirable to design experiments in such a way that maximizes the chance that the outputs, regardless of what they turn out to be, will increase our understanding of the system. In this talk we'll introduce a method which generates data sets that are guaranteed to result in a unique minimal wiring diagram regardless of what the experiment outputs are. We use as a modeling framework polynomial dynamical systems and utilize the correspondence between simplicial complexes and square-free monomial ideals to construct an algorithm for identifying sets whose interpolating minimal polynomials have a unique support.

This talk will be appropriate for undergraduate and graduate students.

About the speaker: Elena Dimitrova is an Associate Professor at the Department of Mathematics. She obtained her Ph.D. at Virginia Tech and spent 13 years as a faculty member at Clemson University in South Carolina before joining Cal Poly. Her research is in the intersection of computation algebraic geometry and mathematical biology. Her most recent focus is on theoretical development and practical applications of algebraic models of molecular networks, including design of experiments, which will be the topic of her talk.

Cookies will be provided before the talk at 4 p.m.
in the same room as the talk, Building 53 Room 206.