Cal Poly Pomona

Colloquium Series
Department of Mathematics & Statistics

Mark Maldonado

Cal Poly Pomona

An Investigation of the \v Cech Homology Groups of the Sierpinski Gasket

We present what we believe to be a unique approach to the computation of the Cech homology groups of the Sierpinski Gasket inspired by Vanessa Robins's work on computational topology. Using inverse limit systems to define Cech homology groups, we construct a sequence of open covers of the Sierpinski Gasket and their Nerves to rigorously verify that the 1st Cech homology group of the Sierpinski Gasket has an infinite Betti number and the 0th Cech homology group of the Sierpinski Gasket has Betti number equal to 1.

Arturo Molinar

Cal Poly Pomona

Clustering E-Commerce Product Purchasing Patterns Using Parametric and Non-Parametric Tests of Homogeneity

In this presentation, we model daily E-commerce product purchase counts as multinomial distributions to cluster underlying product purchasing patterns. Algorithms using parametric tests of homogeneity can generate clusters by testing whether collections of products are sampled from the same distribution. To overcome the strict assumptions of parametric tests, we then model the distributions as dependent Dirichlet Processes and apply a Nonparametric Bayesian Test of Homogeneity to form the clusters. Lastly, we discuss methods of exploratory analysis for interpreting and visualizing the clusters found to support informed business decisions.

February 18, 1:05 - 1:50 pm, 4-2-314

Join remotely via Zoom: https://cpp.zoom.us/j/84908036425