MATHEMATICS DEPARTMENT SEMINAR

Research Journeys in Cal-Bridge and NIH Summer Institute

Time Series Modeling Using Gaussian Process

Jose Mendoza Amador
Department of Mathematics, CSUB

Abstract: This project was completed in summer 2025 at UC Santa Cruz with Alexander Rodriguez from CSU Chico and mentor Dr. Dongwook Lee, supported by the Cal-Bridge Summer Program. We present how Gaussian Process (GP) regression can be utilized in approximating discrete data, for which we do not know a priori any closed functional expressions. GP regression, a kernel-based, non-polynomial, non-parametric Bayesian approach operates on the probability distribution over all admissible functions that fit observed data. We will discuss how GP regression can be used in analyzing discrete data and show a couple of examples of data interpolation and differentiation, which help provide further insights into understanding the mathematical properties of such data in science and engineering applications. In the application problems, we also demonstrate how GP could potentially be incorporated into solving differential equations.

Exploring Key Genes in Acute Kidney Rejection

Rodney Aguirre
Department of Mathematics, CSUB

Abstract: This project was conducted at the University of Texas Medical Branch during a two-month NIH-funded summer research program in 2025. I worked with Dr. Jeong Hoon Jang to examine gene expression in kidney transplant rejection using the Banff Human Organ Transplant (B-HOT) 770-gene panel. Sixty kidney transplant biopsies were analyzed with the NanoString nCounter platform, and statistical and machine learning methods were used to classify samples into different rejection types.

2:10 PM TO 3:00 PM

Wednesday, November 12, 2025

Science III, Room 240