

# Mathematical Sciences Colloquium Series

## Fall 2022



## Dr. Abhijit Mandal

The University of Texas at El Paso

📍 In person at Bell Hall 130 and online via Zoom

*Click on this announcement to access the Zoom link*

📅 Friday, September 9 ⌚ 3pm

## A nonparametric test and its application in genetics and non-linear regression

### Abstract

The single locus association analysis is a common approach to detect variants in genome-wide association studies (GWASs). But it often fails to detect variants with small effect sizes and cannot capture the joint effects of these variants. We have proposed a novel method for the multilocus association analysis that provides a powerful test by jointly modeling the variants within a gene. In this talk, we present a flexible nonparametric model for the association between these variants and the related covariates and the trait to avoid power loss due to model misspecification. The proposed test is computationally efficient to apply at a GWAS level. We analyzed a dataset from the Atherosclerosis Risk in Communities (ARIC) study to detect genes associated with pulmonary function in Caucasians. We also applied our method in testing additive components in non-linear regression using the generalized additive model.

For further information, please contact Dr. Emil Schwab, [eschwab@utep.edu](mailto:eschwab@utep.edu)