The Department of Mathematics presents

A Mathematics Colloquium

Wednesday, January 13, 4:00–4:50pm
Bond Hall 227

Speaker: Jarod Hart (University of Kansas)
Title: Singular Integral Operators, Complex Analysis, and Image Processing

Abstract: In this talk, we will discuss what singular integral operators are and some of the roles they play in harmonic analysis, complex analysis, and image processing. The Hilbert transform, which is a fundamental example of a singular integral operator, will be introduced in the setting of holomorphic function theory. This highlights a deep connection between singular integral operator theory and complex analysis. To better understand boundary behavior of holomorphic functions, we will discuss normed function spaces, modes of convergence, and continuity of singular integral operators. Finally, we will formulate an edge-detection algorithm for images using singular integral operators. The material presented here is adapted from undergraduate math research projects that were completed and are being planned for math courses at the University of Kansas. These courses and associated research projects are supported by an NIH grant for the Initiative for Maximizing Student Development at the University of Kansas.

Refreshments provided by Prof. Berget