

DEPARTMENT OF MATHEMATICS AND STATISTICS

MISSISSIPPI STATE UNIVERSITY

COLLOQUIUM

See the Unseen: Image Enhancement and Feature Detection

SEONGJAI KIM

Department of Mathematics and Statistics

Mississippi State University

Friday, October 7 at 3:30 pm

Allen 14

Abstract. Image processing methods address image enhancement and feature extraction, while imaging techniques focus on effectiveness and reliability in the construction of images, in order to see the unseen more clearly.

As the field of image processing requires higher levels of efficiency and reliability, mathematical imaging techniques have become an important component. For the last decade or so, mathematical frameworks employing powerful tools of partial differential equations (PDEs) and functional analysis have emerged and successfully applied for various image processing tasks, particularly for image enhancement, restoration, and segmentation. However, most of those PDE-based models may lose fine structures or miss interesting features, due to an undesired dissipation or a tendency of converging to local minima. In this talk, we will discuss various new techniques which can significantly improve performance of the conventional PDE-based models, in either mathematical or statistical fashion. Examples will be shown along with challenging geospatial and medical imagery.

The talk will end with some open issues in mathematical image processing.