



The rising STAR of Texas

Differential Equations and Applied Math Seminar

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11am-12pm February 26th, 2021

Zoom

Title: An Image Inpainting Via a Constrained Smoothing and Dynamic Mode Decomposition

Abstract: We present an algebraic and graph theoretic image inpainting algorithm. The algorithm can be used to reconstruct area or volume data from one- and two-dimensional slice data. Given one- or two-dimensional slice data, our algorithm first performs a simple algebraic presmoothing of the data, e.g., Gaussian filters. The second step is to construct low dimensional representation of presmoothed data via Dynamic Mode Decomposition and perform initial area or volume reconstruction via interpolation. The last step is to smooth the result from the second step using a constraint bilateral smoothing, which respects slice data constraints. A number of test cases, including MRI of a three-year-old and a CT scan of a Covid-19 patient, are presented to demonstrate the superiority of the proposed techniques in comparisons with other methods, including a commercial code and the recent multichannel Cahn-Hilliard inpainting algorithm.

Interested faculty and graduate students are encouraged to attend.