

Department of Applied Mathematics Seminar

Prof. Deyu MENG

Xi'an Jiaotong University, China

Topic

Continuous Representation-Induced Regularization Methods for Multi-Dimensional Data Recovery

Date| Time

3 September 2025 (Wednesday) | 11:00am – 12:00nn (HK Time)

Venue

TU817

Abstract:

Most classical regularization-based methods for multi-dimensional imaging data recovery can solely represent multi-dimensional discrete data on meshgrid, which hinders their potential applicability in many scenarios beyond meshgrid. To break this barrier, we propose a series of continuous functional representation methods, which can continuously represent data beyond meshgrid with powerful representation abilities. Specifically, the suggested continuous representation manner, which maps an arbitrary coordinate to the corresponding value, can continuously represent data in an infinite real space. Such an ameliorated representation regime always facilitates better efficiency, accuracy, and wider range of available domains (e.g., non-meshgrid data) of regularization based methods. In this talk, we will introduce how to revolutionize the conventional low-rank, TV, non-local self-similarity regulation methods into their continuous ameliorations, i.e., Low-Rank Tensor Function Representation (termed as LRTFR), neural domain TV (termed as NeurTV), and Continuous Representation-based NonLocal method (termed as CRNL), respectively. We will also show extensive multi-dimensional data recovery applications arising from image processing (like image inpainting and denoising), machine learning (like hyperparameter optimization), and computer graphics (like point cloud upsampling) to validate the favorable performances of our method for continuous representation.

ALL ARE WELCOME