THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

DEPARTMENT OF APPLIED MATHEMATICS
應 用 數 學 系

PolyU Numerical PDEs Seminar

Surface Reconstruction Based on Modified Gauss Formula

By

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Abstract

Surface reconstruction aims at reconstructing continuous surface from discrete point cloud. This is a fundamental problem in computer vision, 3D modeling and many other applications. In this talk, we introduce several surface reconstruction methods based famous Gauss formula in potential theory. Gauss formula provide an explicit integral formula for indicator function. Then surface reconstruction can be transformed to be an integral over the surface which can be computed efficiently by proper quadrature rule and fast multipole method (FMM). For point cloud without oriented normals, Gauss formula also gives effective reconstruction in an implicit manner. Extensive experiments show that our methods are very effective and efficient, even outperform learning based methods.

Biography

Prof. Zuoqiang Shi obtained his Ph.D. from Tsinghua University in 2008. After that, he worked as a Postdoctoral Scholar at California Institute of Technology (Caltech). Since 2011, he has been an Associate Professor and later a Professor at Tsinghua University. Prof. Shi's research interests include numerical methods for PDEs on point clouds, PDE methods for image processing and machine learning, sparse time-frequency representation of nonlinear and nonstationary data, and modeling and simulation of interface problems. He was a plenary speaker in International Congress of Basic Science in 2023 and 2024.

Date: 2 August 2024 (Friday)
Time: 10:30-11:30 (Beijing Time)
Venue: TU817

ALL ARE WELCOME