

数学与系统科学研究院

计算数学所学术报告

报告人: **Prof. Hongwei Li**

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报告题目:

**Regularization                      Methods                      for  
Limited-angle    Computed  
Tomography**

邀请人: 陈冲 副研究员

报告时间: 2021 年 9 月 23 日 (周四)

上午 10:00

报告地点: 科技综合楼

311 教室

## Abstract:

Limited-angle computed tomography is a very challenging problem in applications. Due to high degree of ill-posedness, conventional reconstruction algorithms will introduce serious blurring and heavy streaking artifacts. According to the theory of visible and invisible boundary developed by Quinto et.al, however, the edges tangent to the X-rays are visible and would be well recovered by conventional reconstruction algorithms. Regularization methods, which encode various priors regarding the projection domain or image domain, have been proposed to suppress the limited-angle artifacts.

In this talk, we will review briefly existing regularization methods and propose a new reconstruction model that incorporates the visible edges as prior. Various regularizers shall be utilized to fully utilize the visible edge prior, including neural networks. Experiments on both simulated data and real data shall be provided to validate and verify the effectiveness and efficiency of the proposed model.

## 个人简介:

李宏伟, 教授, 博士生导师, 首都师范大学数学学院。1998年毕业于中国科学院计算数学与科学工程计算研究所, 获理学硕士学位。2002年毕业于中科院软件研究所, 获工学博士学位。2002-2005, 就职于中科院软件所并行计算中心, 研究偏微分方程大规模数值并行计算。2005-2008, 挪威卑尔根大学集成石油研究中心, 博士后, 从事油藏模拟反问题计算及图像处理。2008至今, 首都师范大学数学科学学院, 主要研究CT重建及相关图像处理问题。他的研究以实际应用为导向, 其所研制的图像增强, 图像分割以及CT图像环状伪影校正算法已被CT厂商采用。近年来, 他的研究兴趣转移到了具有挑战性的CT重建问题上来, 如低剂量和有限角重建, 相关研究成果已发表在Medical Physics, Optical Express, JMIV, TIP, Inverse Problems等国际知名期刊上。

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