

数学与系统科学研究院

计算数学所学术报告

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报告题目:

**On Effective Variational Models for  
Global And Local Segmentation Of  
Images**

邀请人: 周涛 博士

报告时间: **2013 年 12 月 12 日(周四)**

**下午 14:30-15:30**

报告地点: 科技综合楼三层 **311**

计算数学所报告厅

## **Abstract:**

The imaging technology is developed in a fast pace and becomes widely available, with equipment cost down and image resolution up. The advance brings unprecedented challenges and demands on better image analysis techniques based on optimization, geometry and nonlinear partial differential equations, beyond the traditional computational algorithms.

In this talk I shall first review variational models that are frequently used for detecting global features in an image i.e. all objects and their boundaries. These include the Chan-Vese (2001) model of the Mumford-Shah (1989) type and other related models. Such models involve non-convex functionals and lead to non-linear partial differential equations (PDEs). The issue of Reformulating the non-convex model as a convex one is addressed. I then present some newer models that are designed to incorporate geometric constraints and detect local features in an image, i.e. local objects and their boundaries. This kind of tasks is frequently met in medical imaging. Finally I consider reformulating a non-convex and local model as a convex one. Various test results are given to illustrate the models presented. Some open challenges are also highlighted.

This talk covers joint work with Jianping Zhang, Lavdie Rada, Jack Spencer (Liverpool, UK), and N. Badshah, H. Ali (Pakistan). Other collaborators in imaging in general include T.F. Chan, R. H. Chan, B. Yu, L. Sun, F. L. Yang (China), C. Brito (Mexico), N. Chumchob (Thailand), M. Hintermuller (Germany), Y. Q. Dong (Denmark), X. C. Tai (Norway) etc.

**欢迎大家参加!**