

数学与系统科学研究院

计算数学所学术报告

报告人: Prof. Zuowei Shen

(National University of Singapore)

报告题目:

Mathematics in Imaging Science

邀请人: 陈志明研究员

报告时间: 2009年9月14日(周一)

下午 4:00—5:00

报告地点: 科技综合楼三层 311

计算数学所报告厅

Abstract:

From the beginning of sciences, visual observations have played major roles.

With the rapid progress in video and computer technology, computers have become powerful enough to process image data. As a result, image processing techniques are now applied to virtually all natural sciences and technical disciplines.

Mathematical analysis makes image processing algorithms predictable, accurate and, in some cases, optimal. New mathematical methods often result in novel approaches that can solve previously intractable problems or that are much faster or more accurate than previous approaches. The speed up that can be gained by fast algorithm is considerable. Fast algorithms make many image processing techniques applicable and reduce the hardware cost considerably.

Wavelet methods are a relatively new mathematical tool that allows us to quickly manipulate images, for example, high-resolution image reconstructions in some

applications, or image compressions in other applications. The wavelet algorithms decompose and arrange an image data into strata reflecting their relative importance. This allows a rapid access to good coarse resolution of the image while retaining the flexibility for increasingly fine representations. It leads to algorithms that give sparse and accurate representations of image and medical image for efficient computation, analysis, storage, restorations and communication. In this talk, I will illustrate how the wavelet theory is developed and applied to various applications in image processing. Several examples will be given.

欢迎大家参加！