Compact Advanced Course
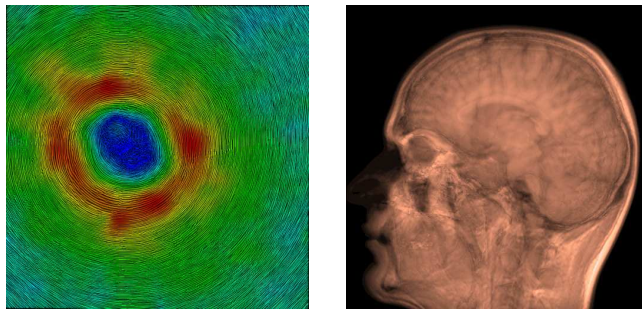# Efficient Multigrid Methods in Computer Vision and Medical Image Processing

The course is intended to give an *introduction to modern numerical methods* for problems in *computer vision and medical image processing*. In these fields one approach to find mathematical models for e.g. image denoising, image segmentation, image registration, or motion detection in image sequences is to construct an energy functional that has to be minimized. This involves the numerical solution of a partial differential equation (PDE) by a multigrid method.

The course starts with an *overview of different applications* and discusses how one can *derive mathematical models* for them. After that the discretization and solution of the arising PDEs is treated. The main part of the course covers multigrid solvers, where a special focus will be on *local Fourier analysis* to estimate their convergence behavior and on their *efficient implementation*. During the course the students will *implement some example applications* like image denoising or motion detection.

When? March 2 – 6, 2009, full days

Where? KTH CSC, Lindstedtsvägen 5, room 4523

Who? Dr. Harald Köstler, University of Erlangen-Nuremberg, Dept. of Computer Science

Audience? Everybody who is interested in image processing

How? 4 hours of lectures in the mornings, 4 hours of hands-on exercises during afternoon

Why? This course is part of a joint Master's programme given by KTH CSC and U Erlangen-Nuremberg

Course code? DN2297

More information `http://www10.informatik.uni-erlangen.de/Teaching/Courses/WS2008/KTHMGCourse/`

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