

Fachbereich Mathematik und Informatik

A U S H A N G

E I N L A D U N G

zum Habilitationsvortrag

Im Rahmen seines Habilitationsverfahrens wird

Herr Dr. Alfonso Caiazzo

**am Mittwoch, d. 6. Juli 2016 um 16.00 Uhr
im Raum 032, Arnimallee 6, 14195 Berlin**

einen Vortrag über das Thema:

**An introduction to smoothing techniques
for diffusion-weighted MRI**

halten.

Der Vortrag wird ca. 45 Minuten dauern (Zusammenfassung s.u.).

Die Universitätsöffentlichkeit ist dazu herzlich eingeladen.

gez. Prof. Dr.-Ing. Jochen Schiller

Dekan des FB Mathematik und Informatik

Abstract: Magnetic Resonance Imaging (MRI) is a medical imaging technique based on the interaction of a strong magnetic field and resonant radiofrequency fields with the atomic nuclei. Unlike X-ray computer tomography, MRI does not rely on energetic radiation, and it can therefore be applied also to healthy subjects, enabling a detailed in vivo examination of tissues. The first part of the talk will describe the principles of the diffusion-weighted magnetic resonance imaging (dMRI), a techniques which, exploiting the fact that nuclear magnetic resonance is sensitive to the diffusion of water molecules, allows the characterization of micro-structure in human brain, spinal cord and muscle tissues, and hence the non invasive detection of tissue anomalies and diseases. In the second part, the talk will focus on smoothing techniques for dMRI images, a necessary step in order to remove noise effects caused, e.g., from electron motion, respiratory and cardiological cycles and hardware fluctuations. In particular, we will discuss recently developed smoothing methods, focusing on the structural adaptive smoothing. This approach relies on qualitative assumptions on the image structure, adapting to this structure and preserving the essential information.