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24. September 2010

Einladung zum Vortrag

von

Frau Dr. Kristjana Yr Jonsdottir

AARHUS UNIVERSITY, DENMARK

Lévy based random fields - with application to neuroimaging data

Neuroimaging data is often analysed using methods based on Gaussian random field theory. An important assumption for enabling the use of these standard methods is that the original imaging data can be modelled as Gaussian random fields. We will show that this is not necessarily the case for some neuroimaging data, since the distribution of the data has heavier tails than the Gaussian distribution.

We propose an alternative modelling framework for this type of data using Lévy basis, i.e. the observed image is modelled as a random field

$$X_v = \int_{\mathbb{R}^3} k(u,v) Z(du),$$

where $v \in \mathcal{V}$ denotes a location in the brain, $k : \mathbb{R}^3 \times \mathbb{R}^3 \longrightarrow \mathbb{R}$ is a kernel function and Z is a Lévy basis on $\mathbb{R}^3$. We will show that imaging data derived from magnetic resonance imaging (MRI) can be modelled using Lévy based random fields where Z is a normal inverse Gaussian Lévy basis. Moreover, we present various known correlation models which can be obtained under this modeling framework.
Finally, we present preliminary results from a simulation analysis where we study the consequences of using standard random field theory to analyse non-Gaussian neuroimaging data.

Termin: Dienstag, 28. September 2010, 15:00 Uhr
Ort: Universität Ulm, Helmholtzstr. 18, Raum 220

Interessenten sind herzlich eingeladen. Der Vortrag findet im Rahmen unseres Forschungsseminars statt.

gez. E. Spodarev