LSGI Distinguished Lecture

Topic: Dealing with Uncertainty in Urban Earth Observation: From Buildings to Land Use

It was our pleasure to invite Prof. Dr. Ir. Alfred Stein, to be our speaker in the LSGI Distinguished Lecture Series on 14 March 2016.

In this presentation an overview of roadblocks and challenges for spatial statistical methods in a big data analysis will be presented. The presentation will be illustrated with an example of statistical modeling with big data and precision aspects that come along, an example of data collected by airplane surveys and a data from a terrestrial survey. The new domain of geo-information health will be introduced.

There is a current research interest on big data and spatial statistics is exceptionally suited to handle big data. It offers opportunities to summarize the data, and express measures of variation and uncertainty. Many of spatial statistical procedures, however, are developed for relatively small datasets. Spatial statistics depends upon the notion of spatial (and spatio-temporal) dependence, and such dependence in turn depends upon distances between locations. For n observations, including their coordinates in space or space and time, evaluating distances requires inspection of n x n pairs of points, a number that grows rapidly. The current data structures are usually not highly suited to efficiently handle big data and specific procedures have to be developed that are able to address issues that are relatively novel, such as combining data in the space-time domain or that have to address specific questions and problems, i.e., to select data from a big data set for a particular application. A particular way ahead may be that classification of the data into multiple classes is done in the form of metadata. In such a way it is possible to make the big data of relevance in a wide range of practical applications. This requires adaptive spatial statistical analysis procedure.

Prof. Dr. Ir. Alfred Stein

Prof. Dr. Ir. Alfred Stein is professor in Spatial Statistics and Image Analysis. He received his MSc in mathematics and information science, with a specialization in applied statistics from Eindhoven University of Technology. He obtained a PhD in 1991 at Wageningen University on spatial statistics, where he started his career at the soil science and geology department.

In 1995 he was appointed a visiting professor at the Faculty ITC, in the soils department. In 2002 he became a professor of Spatial Statistics and Image Analysis at the new department of Earth Observation Science, which he headed for more than 10 years. His research interests focus on statistical aspects of spatial and spatiotemporal data in the widest sense. From 1998 onwards he has been supervising more than 30 PhD students on a range of spatial (and temporal) statistical topics.

Prof. Dr. Ir. Alfred Stein is a member of the SENSE research School. Since 2011 he is the editor-in-chief of Spatial Statistics, the new leading platform in the field of spatial statistics. In 2008 he became vice-rector research of the institute, a position that he had for four years. He is still a member of the faculty management team.