



XXIII International Society for Photogrammetry and Remote Sensing (ISPRS) Congress
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ABSTRACT OF THE TUTORIAL 8

Spatial random models for remotely sensed image analysis

Duration:

Half day - 12 July 2016

Convener:

Dr. Dengfeng Chai

Keywords:

MRF, CRF, DRF, Spatial point processes, Relations between MRFs and SPPs

Target Group:

The tutorial introduce statistical approaches for basic problems of image analysis, such as image segmentation, object extraction etc. So, researchers in these fields may find this tutorial interesting.

Abstract:

With the progresses of image capture techniques, the spatial resolutions of remotely sensed images become higher and higher. As a traditional research topic in photogrammetry and remote sensing, representation of such high resolution images and their corresponding ground scenes becomes much more signi_cant than ever. Markov random fields and spatial point processes are two random models for spatial distributed entities. They are widely-used models in the field of image analysis and computer vision. They also received great interests in the field of photogrammetry and remote sensing. In this tutorial, we will introduce the basic ideas, theories, methods and applications of markov random fields and spatial point processes. The contents are listed as follows:

- Markov random fields
 - Mathematical MRF models
 - MRF, CRF and DRF
 - Parameter estimation
 - Local and global optimization
 - Application
- Spatial point processes
 - Spatial point processes
 - Marked point processes
 - Simulation and optimization
 - Application
- Relations between MRFs and SPPs
 - Modeling
 - Estimation
 - Optimization

Curriculum Vitae:

Dengfeng Chai is an associate professor at college of earth science at Zhejiang University. He received his Doctor's degree from state key lab of CAD&CG at Zhejiang University in 2006. Before that, he received his Master's degree from state key lab of information engineering in surveying, mapping and remote sensing at Wuhan University in 2000 and his Bachelor's degree from Wuhan University in 1997 respectively. From 2010 to 2011, he was a post doctor at Department of Photogrammetry, University of Bonn, Germany. In 2012, he visited INRIA Sophia Antipolis Mediterranee, France for one month. His current research interest is developing statistical approaches for object recognition and extraction from remotely sensed images: statistical models representing ground objects and their images, learning

algorithms training statistical models from annotated data, and inference algorithms estimating statistical models from real images.