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ABSTRACT OF THE TUTORIAL 10

Uncertainty Modelling and Quality Control for Spatial Data

Duration:

Full day - 11 July 2016

Convener:

Prof. Shi Wenzhong, John

Keywords:

Uncertainty modelling, quality control, spatial data, spatial big data, GIS

Target Group:

Students, researchers and practitioners who are in the field of GIS and remote sensing and are interested in uncertainty modelling and quality control in GIS, remote sensing and VGI.

Abstract:

Uncertainty in spatial data is one of the major challenges for geographic information science, and this is especially true in the era of Big Data. For example, big data from social media are subject to uncertainties and these uncertainties affect the further applications of the data significantly.

This tutorial will address uncertainty modelling in spatial data and quality control for spatial data. These include uncertainties in the real world, uncertainties in the cognition of real world objects, modeling errors in spatial object measurement, modeling uncertainty in spatial models, uncertainty propagation in spatial analysis, quality control for spatial data, and presentation of uncertainty information for end users. The theories and methods for handling these uncertainties will be given, and furthermore the technological solutions will also be introduced.

Curriculum Vitae:

Prof Shi is Head of Department and Chair Professor in Geographic Information Science (GISci) and remote sensing, for Department of Land Surveying and Geo-Informatics, The Hong Kong Polytechnic University.

Prof Shi's current research interests are in the areas of GISci and remote sensing, with focusing on uncertainty modelling and quality control for spatial data, object extraction and change detection from satellite images and laser scanning (LiDAR) data, 3D and dynamic modelling and spatial analysis in GISci.

He proposed and developed the principles of modeling uncertainties in spatial data and spatial analyses, and published the first book on this topic. Four major theoretical breakthroughs have been made through his research: (a) from determinant- to uncertainty-based representation of geographic objects in GISci; (b) from uncertainty modeling for static spatial data to dynamic spatial analyses; (c) from uncertainty modeling for spatial data to spatial models; and (d) from error description of spatial data to spatial data quality control. Because of these achievements, he received The Wang Zhizhuo Award, given by the International Society for Photogrammetry and Remote Sensing (ISPRS) in 2012 (Note: "The award is granted at each quadrennial ISPRS Congress to a person who has made significant achievement or innovation in the spatial information sciences."), and also State Natural Science Award (the most prestigious award for basic research in China) by the State Council, China in 2007.

Prof Shi served as President of Commission on Theory and Concepts of Spatial Information Science, International Society for Photogrammetry and Remote Sensing (2008-2012), President for Hong Kong Geographic Information System Association (2001-2003). He also serves as an editorial board member for a number of international journals, including *IJGIS*. He has published more than 200 journal articles (with 130 SCI papers) and over 10 books.