

## LSGI Distinguished Lecture Series

# “Parallel GeoComputation: Design, Implement, and Applications”

### Overview

It was our pleasure to invite Prof. GUAN Qingfeng, Professor of GIScience in the National Engineering Research Center of GIS and the School of Information Engineering at China University of Geosciences (CUG) in Wuhan, China, to deliver a seminar of the LSGI Distinguished Lecture Series on 7 January 2017.



In recent years, the adoption of big data and complex algorithms has greatly increased the computational intensity of geospatial analysis and modeling, leading to extensive computing time and massive memory consumption, hence degrading the scalability and applicability of geospatial analytical and modeling tools. Parallel computing technologies could provide promising solutions to overcome the computational barrier. Prof. GUAN's presentation introduced the recent work on parallel GeoComputation by the High-performance Spatial Computational Intelligence Lab (HPSCIL) at China University of Geosciences, including the parallel Raster Processing Library (pRPL) and the parallel GeoTIFF I/O library (pGTIOL), and several applications of parallel geospatial computing such as parallel Cellular Automata models, parallel areal interpolation, parallel landscape metrics calculation, parallel vector map visualization, and parallel 3D modeling. This presentation also introduced the special considerations and techniques in designing and implementing parallel geospatial algorithms to incorporate the spatio-temporal characteristics of data and algorithms, such as spatial relationships, spatial autocorrelation, spatial heterogeneity, and spatio-temporal dynamics, to further improve the performance and efficiency.

### Prof. GUAN Qingfeng

Dr. Qingfeng GUAN received his Ph.D. degree from the University of California, Santa Barbara, and worked as a post-doc research associate at the Center of Excellence for Geospatial Information Science, U.S. Geological Survey, and as an assistant professor at the University of Nebraska – Lincoln, before joining CUG. Dr. Guan's research interests include high-performance geospatial computing, geospatial data mining, and land-use and land-cover change. He has published over 30 SCI-index journal papers, and was a recipient of the 1000 Young Talents Plan of China (青年千人計劃) in 2012, and the Award for Innovative People of GIS in Colleges (高校 GIS 創新人物獎) in 2014.