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# Annual Report

**C16.11 Geographical Information Science**

Jun Xu

INSTITUTE OF GEOGRAPHY AND NATURAL RESOURCES  
RESEARCH, CAS

# **C16.11 Geographical Information Science**

## **Report 2016-2017**

### **1. Membership**

#### **Co-chair**

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#### **Co-chair**

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#### **Former Chair**

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#### **Secretary**

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## Steering Committee Members

Andrej Medvedeff	Institute for Geographie der Russian Academy of Science	Russia	a.a.medvedeff@gmail.com
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## 2. Meetings

The International Symposium on Spatial Data Handling (SDH) is the premier long-running forum in geographical information science. The 17th International Symposium on Spatial Data Handling was held in Beijing, as a pre-congress meeting of the 33<sup>rd</sup> International Geographical Congress. Also, the steering committee had a meeting during the 33<sup>rd</sup> International Geographical Congress.

### 2.1 SDH2016 (Beijing, August 18-20, 2016)

The 17th International Symposium on Spatial Data Handling (SDH 2016), co-organized by the Commission on Geographic Information Science and the Commission on Modelling Geographical Systems, was held in the Institute of Geographic Sciences and Natural Resources Research (IGSNRR), Chinese Academy of Sciences in Beijing, China from August 18-20, 2016. It was hosted by the State Key Laboratory of Resources and Environmental Information System (LREIS). The theme of the symposium was “Facing the Challenges of Big Data with GIS”. The website of the symposium is <http://sdh2016.csp.science.cn>.

Professor Su Fenzhen, who is the director of LREIS, chaired the opening ceremony. The deputy director of IGSNRR, Liao Xiaohan, gave a welcome address. Professor Francis Harvey from Leibniz Institute for Regional Geography, the chair of IGU - Commission on Geographic Information Science at the time, addressed on the opening ceremony. The member of Scientific Advisory Committee of LREIS, Professor Anthony G.O. Yeh from The University of Hong

Kong, the member of Scientific Advisory Committee of LREIS, reviewed the development of GIScience and the history of LREIS being revolved in the activities of GIScience Commission of IGU.

During the three days of meeting, the participants introduced their recent work and discussions were held on the storage, retrieval, visualization and knowledge discovery of spatial big data; multi-scale spatial data representations; data-intensive geospatial computing, and space-time modeling in open source environment; quality issues, spatial analysis and geographical applications of spatial.

More than 100 people from 12 countries attended the symposium. There are 53 presentations in six parallel sessions, and five invited keynote presentations in two plenary sessions.

Key note speeches:

**Leveraging Big (Geospatial) Data with (Geo) Visual Analytics**

Alan MacEachren

*The Pennsylvania State University, USA*

**Error in Spatial Ecology**

Brian Lees

*University of New South Wales, Australia*

**GIScience beyond Conventional Spatial Data Handling**

Shih-Lung Shaw

*The University of Tennessee, USA*

**Improving GIScience Visualization: Ideas for a New Methodology**

Francis Harvey

*Leibniz Institute for Regional Geography*

**Perspectives on Pan-spatial Information System**

Chenghu Zhou

*The Chinese Academy of Science*



The opening ceremony



Francis Harvey addressing on the opening ceremony



Fenzheng Su chairing the opening



Parallel sessions



Social activities

**Program of the 17<sup>th</sup> Spatial Data Handling Symposium (18/8/2016 – 20/8/2016)**

<b>Thursday (18/Aug/2016)</b>	
<b>09:30 ~ 10:00</b>	<b>Opening Ceremony</b> (Conference Hall 2602)
<b>10:00 ~ 10:20</b>	<b>Tea break &amp; Photo</b>
<b>10:20 ~ 11:50</b>	<b>Keynote speech</b> (Conference Hall 2602) Alan MacEachren: Leveraging big (geospatial) data with (geo) visual analytics Brian Lees: Error in Spatial Ecology
	<b>Lunch</b>
<b>14:00 ~ 15:40</b>	Geographic knowledge discovery and data mining (I) (Room 2321) Big geographical data storage & data-intensive computing (Room 2421)
<b>15:40 ~ 15:55</b>	<b>Tea break</b>
<b>15:55 ~ 17:15</b>	Geographic knowledge discovery and data mining (I) (Room 2321) Big geographical data storage & data-intensive computing (Room 2421)
<b>18:30</b>	<b>Reception dinner</b> (Mei Zhou Dong Po)
<b>Friday (19/Aug/2016)</b>	
<b>08:30 ~ 10:10</b>	Geographic knowledge discovery and data mining (II) (Room 2321) Geo-visualization and data representation (Room 2421)
<b>10:10 ~ 10:25</b>	<b>Tea break</b>
<b>10:25 ~ 11:45</b>	Geographic knowledge discovery and data mining (II) (Room 2321) Geo-visualization and data representation (Room 2421)
	<b>Lunch</b>
<b>14:00 ~ 15:40</b>	Multi-scale spatial data model and algorithm (Room 2321) Geospatial analysis (Room 2421)
<b>15:40 ~ 15:55</b>	<b>Tea break</b>
<b>15:55 ~ 17:15</b>	Multi-scale spatial data model and algorithm (Room 2321) Geospatial analysis (Room 2421)
<b>18:30</b>	<b>Buffet dinner</b> (North Canteen, the 2 <sup>nd</sup> floor)
<b>Saturday (20/Aug/2016)</b>	
<b>08:30 ~ 09:50</b>	<b>Keynote speech</b> (Conference Hall 2602) Shih-Lung Shaw: GIScience beyond conventional spatial data handling Francis Harvey: Improving GIScience visualization: ideas for a new methodology
<b>09:50 ~ 10:05</b>	<b>Tea break</b>
<b>10:05 ~ 10:45</b>	<b>Keynote speech</b> (Conference Hall 2602) Chenghu Zhou: Pan-spatial information system
<b>10:45 ~ 11:30</b>	<b>Closing Ceremony</b> (Conference Hall 2602)

## 2.2 Steering committee meeting (Beijing, August 23, 2016)

During the 33<sup>rd</sup> International Geographical Congress, the steering committee had a meeting. Francis Harvey retired from the chair of the committee, and Denial Sui and Fenzhen Su became the co-chairs of the committee. On the meeting, the members from the committee members LREIS summarized the SDH 2016 and proposed the plan for publishing the proceedings. Other issues, such as the maintenance of the commission's website and the mailing list, were discussed.

## 2.3 Forthcoming meetings

**The 18<sup>th</sup> International Symposium on Spatial Data Handling** will be hold in Moscow on **June 6-9, 2018**, right after the IGU Thematic Conference. The theme of the meeting is "Technological challenges and informational challenges". The website of the meeting is <http://www.sdh2018.ru/>.

**The 10th International Workshop on Pattern Recognition in Remote Sensing (PRRA 2018)** will be hold in Beijing on **August 19-10**. It is organized by the Technical Committee 7 (TC-Remote Sensing and Mapping) of the International Association for Pattern Recognition (IAPR), and will be hosted by LREIS. The IGU commission on Geographical Information Science will co-organize this symposium with State Key Laboratory of Resource and Environmental Information System, IGSNRR, CAS, State Key Laboratory of Remote Sensing Science, Institute of Remote Sensing and Digital Earth, CAS, and State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University. The website of the workshop is <http://www.prrs2018.org/>.

## 3. Networking

The commission on Geographical Information Science has long cooperation with the IGU commission on Modelling Geographical Systems and Commission II of the International Society of Photogrammetry and Remote Sensing (ISPRS). We hold several symposiums on SDH together with these two commissions.

This year, we have expanded our network with the Technical Committee 7 (TC-Remote Sensing and Mapping) of IAPR. The PRRA 2018 will be hold in Beijing, China. The commission on Geographical Information Science will be the co-organizer.

## 4. Publication

### 4.1 Website

The current website of the commission is <http://igugis.lreis.ac.cn/>. A Google group name IGUGIS was set up, so commission members can share messages by sending email to [igugis@googlegroups.com](mailto:igugis@googlegroups.com). A frame of google group was embedded in the webpage of the

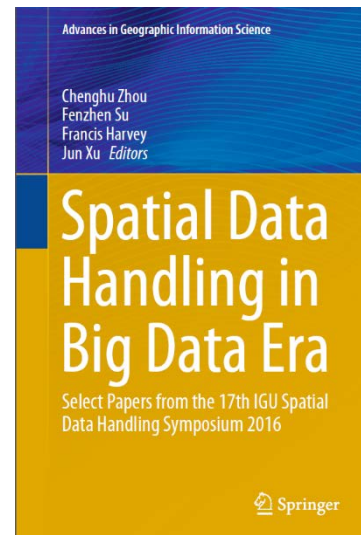
commission, which is located at <http://igugis.lreis.ac.cn/igu6.html>, therefore people not in this commission can also check the messages on our website.

## 4.2 Publication

Selected papers from DH 2016 were published in a book by Springer. For SDH 2016, over 65 paper proposals were received and reviewed by the international program committee and additional reviewers. Based on the peer review of abstracts, 54 papers have been accepted to be presented on the conference. Finally, 20 papers were submitted to the second round of peer review, and 15 papers were selected to be included in the book.

### Citation:

Zhou, C.H., Su, F.Z., Harvey, F., Xu, J.(Eds.) 2017. *Spatial Data Handling in Big Data Era: Select Papers from the 17th IGU Spatial Data Handling Symposium 2016*. Springer.



The content of this book are as follows:

### **Part 1 Data Intensive Geospatial Computing and Data Quality**

Using T-Drive and BerlinMod in Parallel SECONDO for Performance Evaluation of Geospatial Big Data Processing

Mudabber Ashfaq, Ali Tahir, Faisal Moeen Orakzai, Gavin McArdle, Michela Bertolotto

Integrated Geo-Information Database for Geological Disposal of High-level Radioactive Waste in China

Peng Wang, Yong-an Zhao, Min Gao, Shu-tao Huang, Ju Wang, Lun Wu, Heng Cai

Analyzing the Uncertainties of Ground Validation for Remote Sensing Land Cover Mapping in the Era of Big Geographic Data

Bo Sun, Xi Chen, Qiming Zhou

Error in Spatial Ecology (PVM)

Brain Lees

### **Part 2 Web and Crowd Sourcing Spatial Data Mining**

A Framework for Event Information Extraction from Chinese News Online

Shuang Wang, Yecheng Yuan, Tao Pei, Yufen Chen

Evaluating Neighborhood Environment and Utilitarian Walking Behavior with Big Data: A Case Study in Tokyo Metropolitan Area



Hao Hou, Yuji Murayama

A Space-Time GIS for Visualizing and Analyzing Clusters in Large Tracking Datasets  
Hongbo Yu

An Extended Community Detection Algorithm to Compare Human Mobility Flow Based on Urban Polycentric Cluster Boundaries: A Case Study of Shenzhen City  
Zhixiang Fang, Lihan Liu, Shih-Lung Shaw, Ling Yin

### **Part 3 Visualization of Big Geographical Data**

Improving GIScience Visualization: Ideas for a New Methodology  
Francis Harvey

Leveraging Big (geo) Data with (geo)Visual Analytics: Place as the next frontier  
Alan M. MacEachren

A Comparative Study of Various Properties to Measure the Road Hierarchy in Road Networks  
Xun Wu, Hong Zhang, Yunhui Xu, Jie Yang

Detail Resolution: A New Model to Describe Level of Detail Information of Vector Line Data  
Xiaoqiang Cheng, Huayi Wu, Tinghua Ai, Min Yang

### **Part 4 Spatial Analysis and Simulation**

Urban Growth Evaluation: A New Approach Using Neighborhood Characteristics of Remotely Sensed Land Use Data  
Shyamantha Subasinghe, Yuji Murayama

Influential Factors of Building Footprint Location and Prediction of Office Shape in City Blocks in Tokyo's Commercial Zones  
Masahiro Taima, Yasushi Asami, Kimihiro Hino

Modelling Urban Growth Evolution Using SLEUTH Model: A Case Study in Wuhan City, China  
Wenyou Fan, Yueju Shen, Jianfang Li, Lina Li

## **5. Archival Contributions**

We have sent the book *Spatial Data Handling in Big Data Era: Select Papers from the 17th IGU Spatial Data Handling Symposium 2016* for the IGU archives to Dr. Bruno Schelhaas, Leibniz Institute for Regional Geography.