

**Advanced Program**

**IIP2008**

5th IFIP International Conference

On

**Intelligent Information Processing**

18-22, October, 2008

Beijing, China



**Advanced Program**

*5th IFIP International Conference on*  
*Intelligent Information Processing*

**ICIIP 2008 – Beijing**

October 18-22, 2008

Beijing, China

**Sponsored by**

International Federation for Information Processing, IFIP TC12

**Co-Sponsored by**

Chinese Association of Artificial Intelligence

Institute of Computing Technology, Chinese Academy of Sciences

Lyon 3 University

## Welcome Address

Dear Colleagues,

Welcome to the 5th IFIP International Conference on Intelligent Information Processing. We would like to extend to you our warmest welcome and sincere greetings. As the world proceeds quickly into the Information Age, it encounters both successes and challenges, and it is well recognized nowadays that Intelligent Information Processing provides the key to the Information Age and to mastering many of these challenges. Intelligent Information Processing supports the most advanced productive tools that are said to be able to change human life and the world itself. However, the path is never a straight one and every new technology brings with it a spate of new research problems to be tackled by researchers; as a result we are not running out of topics; rather the demand is ever increasing. This conference provides a forum for engineers and scientists in academia, university and industry to present their latest research findings in all aspects of Intelligent Information Processing.

This is the 5th IFIP International Conference on Intelligent Information Processing. We received over more than 50 papers, of which 22 papers are included in this program as regular papers and 5 as short papers. We are grateful for the dedicated work of both the authors and the referees, and we hope these proceedings will continue to bear fruit over the years to come. All papers submitted were reviewed by several referees.

A conference such as this cannot succeed without help from many individuals who contributed their valuable time and expertise. We want to express our sincere gratitude to the program committee members and referees, who invested many hours for reviews and deliberations. They provided detailed and constructive review reports that will significantly improve the papers included in the program.

We are very grateful to have the sponsorship of the following organizations: IFIP TC12, Chinese Association of Artificial Intelligence, Institute of Computing Technology, Chinese Academy of Sciences.

We hope all of you enjoy this diverse and interesting Program!

Zhongzhi Shi, China

Eunika Mercier-Laurent, France

David Leake, USA

IIP2008 Program Committee Chairs

## Conference Organization

### General Chairs

Danielle Boulanger (France)  
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# Plenary Speeches

## Semantic Computing

Phillip C-y Sheu  
EECS and Biomedical Engineering  
University of California, Irvine

**Abstract:** This talk highlights the past, present and future of semantic computing that brings together those disciplines concerned with connecting the (often vaguely-formulated) intentions of humans with computational content. This connection can go both ways: retrieving, using and manipulating existing content according to user's goals ("do what the user means"); and creating, rearranging, and managing content that matches the author's intentions ("do what the author means").

The content addressed in SC includes, but is not limited to, structured and semi-structured data, multimedia data, text, programs, services and, even, network behavior. This connection between content and the user is made via (1) Semantic Analysis, which analyzes content with the goal of converting it to meaning (semantics); (2) Semantic Integration, which integrates content and semantics from multiple sources; (3) Semantic Applications, which utilize content and semantics to solve problems; and (4) Semantic Interfaces, which attempt to interpret users' intentions expressed in natural language or other communicative forms.

The field Semantic Computing applies technologies in natural language processing, data and knowledge engineering, software engineering, computer systems and networks, signal processing and pattern recognition, and any combination of the above to extract, access, transform and synthesize the semantics as well as the contents of multimedia, texts, services and structured data.

**Bio-Sketch:** Dr. Phillip C-Y. Sheu is currently a professor of EECS and Biomedical Engineering at the University of California, Irvine. He also serves as the Founding Director of the Institute for Semantic Computing, an international research organization that connects industry, government and academia to promote semantic technologies. He received his Ph.D. and M.S. degrees from the University of California at Berkeley in Electrical Engineering and Computer Science in 1986 and 1982, respectively. From 1986 to 1988, he was an assistant professor at School of Electrical Engineering, Purdue University. From 1989 to 1993, he was an associate professor of Electrical and Computer Engineering at Rutgers University.

He has published two books: (1) Intelligent Robotic Planning Systems and (2) Software Engineering and Environment - An Object-Oriented Perspective, and more than 100 papers in object-relational data and knowledge engineering and their applications. His current research interests include semantic computing and complex biomedical systems. He is a Fellow of IEEE and the founding editor-in-Chief of the International Journal of Semantic Computing. He is also a co-editor of the forth-coming book "Semantic Computing" (Wiley/IEEE Press, Eds. Phillip Sheu, Heather Yu, C.V. Ramamoorthy, Aravind Joshi and L.A. Zadeh, 2008).

# Towards Brain-inspired Web Intelligence

Ning Zhong

Department of Life Science and Informatics  
Maebashi Institute of Technology, Japan

**Abstract:** Artificial Intelligence (AI) has been mainly studied within the realm of computer based technologies. Various computational models and knowledge based systems have been developed for automated reasoning, learning, and problem-solving. However, there still exist several grand challenges. The AI research has not produced major breakthrough recently due to a lack of understanding of human brains and natural intelligence. In addition, most of the AI models and systems will not work well when dealing with large-scale, dynamically changing, open and distributed information sources at a Web scale.

The next major advances in artificial intelligence and Web intelligence are most likely to be brought by an in-depth understanding of human intelligence and its application in the design and implementation of systems with human-level intelligence. To prepare us ready for the great opportunity, this talk outlines a unified framework for the study of brain inspired Web intelligence (WI) by exploring the latest results from brain informatics (BI). This leads to profound advances in the analysis and understanding of data, knowledge, intelligence and wisdom, as well as their inter-relationships, organization and creation process. The fast-evolving WI research and development initiatives are now moving towards understanding the multi-facet nature of intelligence in depth and incorporating it on a Web scale. The recently developed instrumentation (fMRI etc.) and advanced IT are causing an impending revolution in WI research and development, making it possible for us to pursue the new frontier of intelligence science and develop human-level Web intelligence.

**Bio-Sketch:** Ning Zhong received the Ph.D. degree in the Interdisciplinary Course on Advanced Science and Technology from the University of Tokyo. He is currently head of Knowledge Information Systems Laboratory, and a professor in Department of Life Science and Informatics at Maebashi Institute of Technology, Japan. He is also director and an adjunct professor in the International WIC Institute (WICI), Beijing University of Technology.

He has conducted research in the areas of knowledge discovery and data mining, rough sets and granular-soft computing, Web intelligence, intelligent agents, brain informatics, and knowledge information systems, with over 200 journal and conference publications and 20 books. He is the editor-in-chief of the Web Intelligence and Agent Systems journal (IOS Press), associate editor of IEEE Transactions on Knowledge and Data Engineering, and the Knowledge and Information Systems journal (Springer), a member of the editorial board of Transactions on Rough Sets (Springer), and the editorial board of Advanced Information and Knowledge Processing(AI&KP) book series (Springer), Frontiers in AI and Applications book series (IOS Press), Chapman&Hall/CRC Data Mining and Knowledge Discovery book series, and editor (the area of intelligent systems) of the Encyclopedia of Computer Science and Engineering (Wiley).

He is the co-chair of Web Intelligence Consortium (WIC), chair of the IEEE Computer Society Technical Committee on Intelligent Informatics (TCII), member of the steering committee of IEEE International Conferences on Data Mining (ICDM), vice chair of IEEE Computational Intelligence Society

Technical Committee on Granular Computing, the steering committee of International Rough Set Society.

He has served or is currently serving on the program committees of over 100 international conferences and workshops, including IEEE ICDM'02(conference chair), IEEE ICDM'06 (program chair), IEEE/WIC WI-IAT'03(conference chair), IEEE/WIC/ACM WI-IAT'04 (program chair), and IJCAI'03 (advisory committee member).

He was awarded the best paper awards of AMT'06, JSAI'03, IEEE TCCI/ICDM Outstanding Service Award in 2004, and Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD) Most Influential Paper Award (1999-2008).

## Data Mining Technologies Inspired from Visual Principle

Zongben Xu  
Mathematics and computer science  
Xi'an Jiaotong University, China

**Abstract:** In this talk we review the recent work done by our group on data mining (DM) technologies deduced from simulating visual principle. Through viewing a DM problem as a cognition problems and treading a data set as an image with each light point located at a datum position, we developed a series of high efficient algorithms for clustering, classification and regression via mimicking visual principles. In pattern recognition, human eyes seem to possess a singular aptitude to group objects and find important structure in an efficient way. Thus, a DM algorithm simulating visual system may solve some basic problems in DM research. From this point of view, we proposed a new approach for data clustering by modeling the blurring effect of lateral retinal interconnections based on scale space theory. In this approach, as the data image blurs, smaller light blobs merge into large ones until the whole image becomes one light blob at a low enough level of resolution. By identifying each blob with a cluster, the blurring process then generates a family of clustering along the hierarchy. The proposed approach provides unique solutions to many long standing problems, such as the cluster validity and the sensitivity to initialization problems, in clustering. We extended such an approach to classification and regression problems, through combatively employing the Weber's law in physiology and the cell response classification facts. The resultant classification and regression algorithms are proven to be very efficient and solve the problems of model selection and applicability to huge size of data set in DM technologies. We finally applied the similar idea to the difficult parameter setting problem in support vector machine (SVM). Viewing the parameter setting problem as a recognition problem of choosing a visual scale at which the global and local structures of a data set can be preserved, and the difference between the two structures be maximized in the feature space, we derived a direct parameter setting formula for the Gaussian SVM. The simulations and applications show that the suggested formula significantly outperforms the known model selection methods in terms of efficiency and precision.

The advantages of the proposed approaches are: 1) The derived algorithms are computational stable and insensitive to initialization and they are totally free from solving difficult global optimization problems. 2) They facilitate the construction of new checks on DM validity and provide the final DM result a significant degree of robustness to noise in data and change in scale. 3) They are free from model selection in

application. 4) The DM results are highly consistent with those perceived by our human eyes. 5) They provide unified frameworks for scale-related DM algorithms recently derived from many other fields such as estimation theory, recurrent signal processing, information theory and statistical mechanics, and artificial neural networks.

**Bio-Sketch:** Zongben Xu received his MS degree in Mathematics in 1981 and PhD degree in applied Mathematics in 1987 from Xi'an Jiaotong University, China. In 1998, he was a post-doctoral researcher in the Department of Mathematics, The University of Strathclyde (UK), He worked as a research fellow in the Department of Computer Science and Engineering from 1992 to 1994, and 1996 to 1997, at The Chinese University of Hong Kong; a visiting professor in the University of Essex (UK) in 2001, and Napoli University (Italy) in 2002. He has been with the Faculty of Science and Institute for Information and System Sciences at Xi'an Jiaotong University since 1982, where he was promoted to associate professor in 1987 and full professor in 1991, and now serves as professor of Mathematics and computer science, director of the Institute for Information and System Sciences, and vice president of Xi'an Jiaotong University. In 2007, he was appointed as a Chief Scientist of National Basic Research Program of China (973 Project).

Professor Xu currently makes several important services for government and professional societies, including Consultant Expert for National (973) Program in Key Basic Science Research and Development (Information group), Ministry of Science and Technology of China; Evaluation Committee Member for Mathematics Degree, Academic Degree Commission of the Chinese Council; Committee Member in Scientific Committee of Education Ministry of China (Mathematics and Physics Group); Vice-Director of the Teaching Guidance Committee for Mathematics and Statistics Majors, the Education Ministry of China; Director of the Teaching Guidance Committee for Mathematics Education, the Education Ministry of China; Member in the Expert Evaluation Committee for Natural Science Foundation of China (Computer Science Group), The National Committee for Natural Science Foundation of China; Vice-president of Computational Intelligence Society of China; Editor-in-chief of the Textbooks on Information and Computational Sciences, Higher Education Press of China; Co-editor of nine national and international journals.

Professor Xu has published over 150 academic papers on non-linear functional analysis, optimization techniques, neural networks, evolutionary computation, and data mining algorithms, most of which are in international journals. His current research interests include non-linear analysis, machine learning and computational intelligence. Dr. Xu holds the title "Owner of Chinese PhD Degree Having Outstanding Achievements" awarded by the Chinese State Education Commission (CSEC) and the Academic Degree Commission of the Chinese Council in 1991. He is owner of the National Natural Science Award of China in 2007.

## Overview of Technical Program

	October 18 Saturday	October 19 Sunday			September 20 Monday	October 21 Tuesday	October 22 Wednesday
<b>8:00-8:30</b>		Registration			Registration	Registration	Social Activity
<b>8:30-10:00</b>		MCAI Opening Ceremony And Plenary Sessions 1			10 Sessions	10 Sessions	
<b>10:00-10:30</b>	Registration	Coffee Break					
<b>10:30-12:00</b>	Registration	MCAI Plenary Sessions 2			10 Sessions	10 Sessions	
<b>12:00-14:00</b>	Registration	Lunch					
<b>14:00-15:30</b>	Registration	ICAI &IIP Plenary Sessions1	NLPKE Plenary Sessions1	ICHS Plenary Sessions1	10 Sessions	IIP Session 7	
<b>15:30-16:00</b>	Registration	Coffee Break					
<b>16:00-17:30</b>	Registration	ICAI &IIP Plenary Sessions2	NLPKE Plenary Sessions2	ICHS Plenary Sessions2	10 Sessions	New Idea Forum IIP Session 8	
<b>18:00-20:00</b>	Registration	Reception				Banquet	

**Notes: MCAI: Multi-Conference on Advanced Intelligence 2008**

**ICAI: The 1st International Conference on Advanced Intelligence (ICAI-08)**

**NLPKE: IEEE International Conference on Natural Language Processing and Knowledge Engineering (NLP-KE'08)**

**ICHS: The Fourth International Conference on Humanized Systems (ICHS'08)**

**IIP: 5th International Conference on Intelligent Information Processing (IIP2008)**

# Technical Program

## **Saturday October 18, 2008**

10:00am – 5:00pm: Registration

## **Sunday October 19, 2008**

8:00am – 5:00pm: Registration

### **8:30am-9:00am: MCAI Opening Ceremony**

Chair: Xindong Wu

### **9:00-10:00 Plenary Session 1**

Chair: Yixin Zhong

Lotfi A. Zadeh (USA): From Natural Intelligence to Machine Intelligence--a Challenge That is Hard to Meet

### **10:00am-10:30am Photo Taken**

### **10:30am-12:30pm: MCAI Plenary Session 2**

Chair: Huisheng Chi

Lin Chen(China): Primitive Units over Which Cognitive Processes Operate: Perceptual Objects and Their Topological Definition

Hugo de Garis (Australia): Recent Progress in Artificial Brain Research

### **12:30pm-2:00pm: Lunch Break**

### **2:00pm– 3:30pm: ICAI & IIP Plenary Session 1**

Chair: Deshu Li

Toshio FuKuda (Japan):

Philip C-Y Sheu (USA): Semantic Computing

Ning Zhong (Japan): Towards Brain-inspired Web Intelligence

### **3:30pm-4:00pm: Coffee Break**

### **4:00pm-5:30pm: ICAI & IIP Plenary Session 2**

Chair: Min Tan

Zongben Xu: Data Mining Technologies Inspired Visual Principles

Fuji Ren: Recent Progress in Affective Computing

Feiyue Wang:

# IIP Session

**Monday October 20, 2008**

**8:30am-10:00am**

## **Session 1: Semantic Web Services**

Chair: *Mieczyslaw L. Owoc*

1. A Context Model for Service Composition Based on Dynamic Description Logic  
*Wenjia Niu, Zhongzhi Shi and Liang Chang*
2. Evaluation of Ontologies and DL Reasoners  
*Muhammad Fahad, Muhammad Abdul Qadir and Syed Adnan Hussain Shah*
3. ER2OWL: Generating OWL ontology from ER Diagram  
*Muhammad Fahad*

**10:00am-10:30am: Coffee Break**

**10:30am-12:00am**

## **Session 2: Knowledge Acquisition and Management**

Chair: *Muhammad Abdul Qadir*

1. Voice Knowledge Acquisition System  
*Stefan du Château, Danielle Boulanger and Eunika Mercier-Laurent*
2. Granularity of Knowledge from Different Sources  
*Maria A. Mach and Mieczyslaw L. Owoc*
3. Fuzzy Ontology Models Based on Fuzzy Linguistic Variable for Knowledge Management and Information Retrieval  
*Jun Zhai, Yiduo Liang, Jiatao Jiang and Yi Yu*

**12:00pm-2:00pm: Lunch**

**2:00pm-3:30pm**

## **Session 3: Data Mining**

Chair: *Ines Bayouhdh*

1. Blog Classification: Adding Linguistic Knowledge to Improve the K-NN Algorithm  
*Ines Bayouhdh, Nicolas Béchet and Mathieu Roche*
2. A Modified Clustering Method with Fuzzy Ants  
*Jianbin Chen, Deying Fang and Yun Xue*
3. An New Algorithm for Modeling Regression Curve  
*JiSheng Hao, Lerong Ma and Wendong Wang*

**3:30pm-4:00pm: Coffee Break**

**4:00pm-5:30pm**

## **Session 4: Web Search**

Chair:

1. Enhancing Web Search with Heterogeneous Semantic Knowledge  
*Rui Huang and Zhongzhi Shi*
2. Exploring Words with Semantic Correlations from Chinese Wikipedia

- Yun Li, Kaiyan Huang, Seiji Tsuchiya, Fuji Ren and Yixin Zhong*  
3. A Heuristic Knowledge Reduction Algorithm Based on Partition Subdivision and Consistent Degree  
*Wen Huo and Xiaoguang Hong*

**Tuesday October 21, 2008**

**8:30am-10:00am**

**Session 5: Cognition-based Intelligent Information Processing**

Chair: *Arne Jacobs*

1. Object-based Image Retrieval with Attention Analysis and Spatial Reranking  
*Ke Gao, Shouxun Lin, Yongdong Zhang and Sheng Tang*
2. Forecasting Stock Exchange Movements Using Artificial Neural Network Models and Hybrid Models  
*Erkam Guresen and Gülgün Kayakutlu*
3. A Robot Emotion Generation Mechanism Based on PAD Emotion Space  
*Qingji Gao, Kai Wang and Haijuan Liu*
4. Study of Personalized Network Tutoring System Based on Emotional-cognitive Interaction  
*Manfei Qi, Ding Ma and Wansen Wang*

**10:00am-10:30am: Coffee Break**

**10:30am-12:00am**

**Session 6: Image Processing**

Chair: *Erkam Guresen*

1. A Novel Fingerprint Matching Method Combining Geometric and Texture Features  
*Mei Xie, Chengpu Yu and Jin Qi*
2. Distinctive Image Region Features from Color Invariant Moments  
*L. Guo, Z. Shi, J. Zhao and R. Zhang*
3. Inter-video Similarity for Video Parsing  
*Arne Jacobs, Andree Lüdtke and Otthein Herzog*
4. Image Segmentation of Historical Handwriting from Palm Leaf Manuscripts  
*Olarik Surinta and Rapeeporn Chamchong*

**12:00pm-2:00pm: Lunch**

**2:00pm-3:30pm**

**Session 7: Virtual Organization and Applications**

Chair: *Zygmunt Vetulani*

1. Virtual Organizations: Trends and Models  
*Mohammad Reza Nami and Abbaas Malekpour*
2. A Survey on UML Based Regression Testing  
*Muhammad Fahad and Aamer Nadeem*
3. Virtual Organizations: An Overview  
*Mohammad Reza Nami*

**3:30pm-4:00pm: Coffee Break**

**4:00pm-5:30pm**

**Session 8: Risk Management and Computational Linguistics**

Chair: *Frédérique Segond*

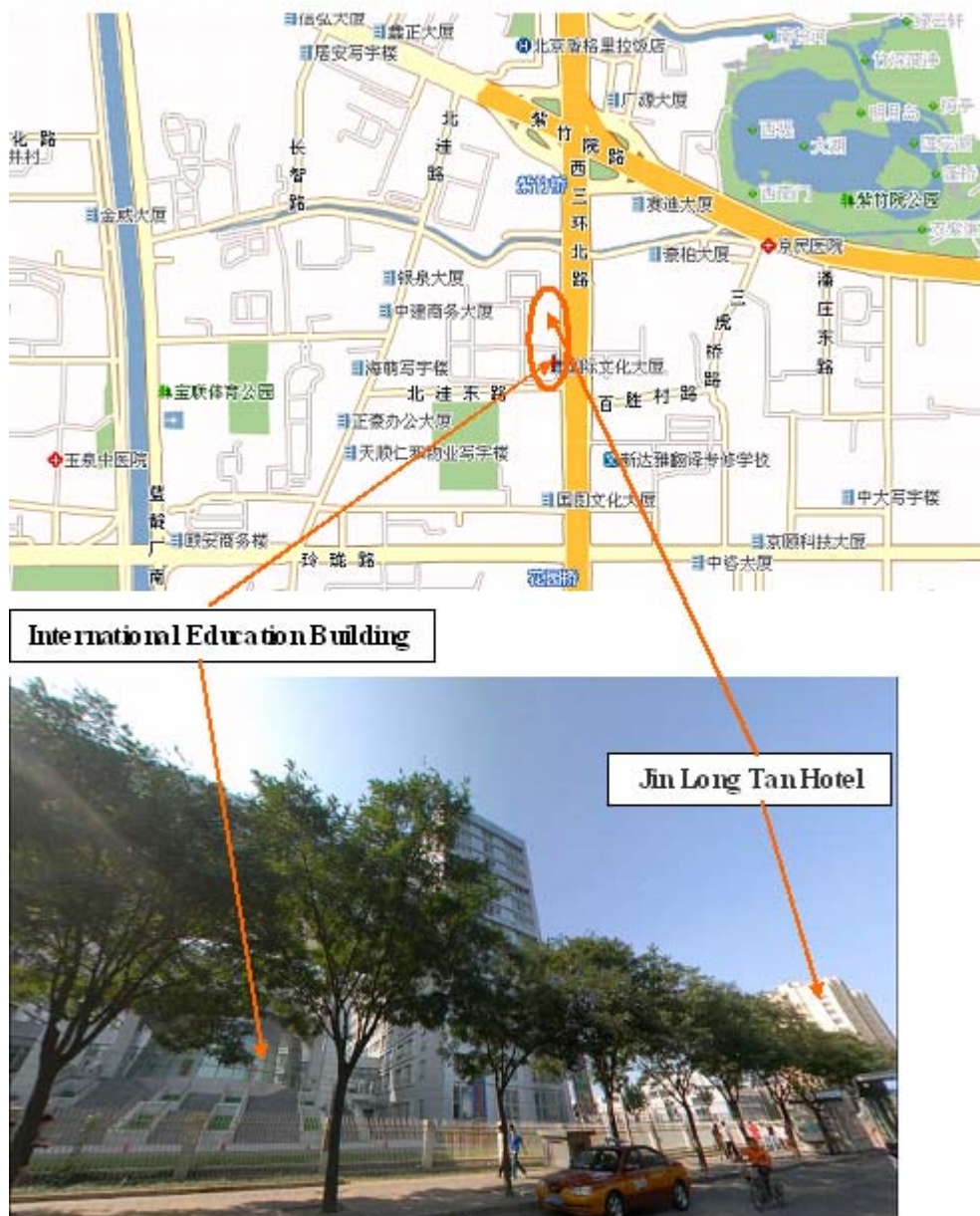
1. A Risk Assessment System with Automatic Extraction of Event Types  
*Philippe Capet, Thomas Delavallade, Takuya Nakamura, Agnes Sandor, Cedric Tarsitano and Stavroula Voyatzi*
2. Addressing Risk Assessment for Patient Safety in Hospitals through Information Extraction in Medical Reports  
*Denys Proux, Frédérique Segond, Solweig Gerbier and Marie Hélène Metzger*
3. An SMS-based System Architecture (Logical Model) to Support Management of Information Exchange in Emergency Situations  
*Zygmunt Vetulani, Jacek Marciniak, Paweł Konieczka and Justyna Walkowska*
4. Semi Automatic Ontology Instantiation in the Domain of Risk Management  
*Jawad Makki, Anne-Marie Alquier and Violaine Prince*

## Conference Venue

MCAI 2008 will be held at International Education Building of Capital Normal University, Beijing, China, from October 18 to 22, 2008. Please download the reservation form(in English) or the reservation form(in Chinese) to book hotel and send it via email to caai@bupt.edu.cn .

MCAI 2008 has arranged accommodation at International Education Building and Jin Long Tan Hotel. Please make a choice between the two hotels.

Location of the Hotels:



International Education Building serves as both the venue of conferences of MCAI 2008 and the hotel. Living in International Education Building is more convenient to attending the conferences and its facilities are good enough with affordable rates. Room reservation will begin after September 1. Address No. 83 North Road, West Third Ring, Beijing, 100089, China

Jin Long Tan Hotel is next to International Education Building. It has 315 sets of luxurious guest rooms, the banquet hall, the assembly hall, the business center, the cosmetology styles hair and so on. Living in Jin Long Tan Hotel is more comfortable and its special conference rates are reasonable. For more information about Jin Long Tan Hotel or online reservation, please access the website: <http://www.jinlongtanhotel.net> Address: No.71, North Road, West Third Ring, Beijing 100089, China Tel: (86 010)88811188 Fax: (86 010) 68433775

## **Traffic Information**

While take taxi, please show taxi driver the Chinese addresses: 西三环北路 83 号（紫竹桥南）,首都师范大学国际文化大厦 or 西三环北路 71 号（紫竹桥南）,北京金龙潭大饭店

From Beijing Capital International Airport to the venue or hotels, the suggest routes are 1. Take taxi to the venue or hotels directly. The cost is around RMB120(US\$17). 2. Take subway to Dong Zhi Men Station, then change taxi to the venue or hotels. 3. Take an airport shuttle bus to Zi Zhu Qiao station (紫竹桥), then change taxi to the venue or hotels.