

2009 International Conference on Active Media Technology  
2009 International Conference on Brain Informatics

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# Final Program

**AMT'09 and BI'09**

**October 22-24, 2009**

*Grand Gongda Jianguo Hotel*

**International WIC Institute  
Beijing University of Technology  
Beijing, China**

*<http://www.wici-lab.org/amtbi09/>*

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## **Co-organized by:**

Web Intelligence Consortium (WIC)

IEEE Task Force on Brain Informatics (IEEE TF-BI)



## Conference Sponsors

### Co-organized by



Web Intelligence Consortium (WIC)



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## Table of Contents

Conference Sponsors.....	2
Message from the Conference and Program Chairs.....	4
AMT'09/BI'09 Program AT A GLANCE.....	6
AMT'09/BI'09 Program.....	7
AMT'09/BI'09 Invited Talks.....	14
BI'09 Special Session.....	20
AMT'09 Special Sessions.....	21
Organizing Committee.....	22

## Message from the Conference and Program Chairs

We are pleased to give you a warm welcome to the 2009 International Joint Conference on Active Media Technology and Brain Informatics (AMT 2009 and BI 2009). On behalf of the AMT 2009 and BI 2009 Conference Committees, we would like to thank you for your participation and we do hope that you will enjoy the conference technical and social programs.

The AMT 2009 and BI 2009 conferences are organized by Web Intelligence Consortium (WIC) and IEEE Computational Intelligence Society Task Force on Brain Informatics (IEEE TF-BI).

Over the past years, Active Media Technology (AMT) and its applications have engulfed our daily lives, enhancing connectivity and interactivity in ways never imaginable; today's examples include Facebook, Twitter, and Google Latitude. At the same time, AMT applications have redefined how business is being conducted by empowering consumer engagement and participation (e.g., ParkatmyHouse.com). Advertisers are tapping into social networks to create new business opportunities (e.g., social media marketing). Intelligent electric grids are enabling better energy-efficient distribution and storage, while fighting climate change (e.g., ecotricity.com and eco-metering).

AMT 2009 marked the fifth of the AMT series since its debut conference at Hong Kong Baptist University in 2001 (followed by AMT 2004 in Chongqing, China, AMT 2005 in Kagawa, Japan, and AMT 2006 in Brisbane, Australia). All these have once again confirmed our vision back in 2001 to capture and document the evolution unfolding in our digital era. AMT 2009 continued to be a shared forum for researchers and practitioners from diverse fields, such as computer science, information technology, artificial intelligence, Web intelligence, cognitive science, conversational informatics, media engineering, economics, data mining, data and knowledge engineering, intelligent agent technology, human computer interaction, complex systems and systems science. It offered new insights into the main research challenges and development of AMT by revealing the interplay between the studies of human informatics and the research of informatics on the Web/Internet, mobile and wireless centric intelligent information processing systems.

Brain Informatics (BI) has emerged as an interdisciplinary research field that focuses on studying the mechanisms underlying the human information processing system (HIPS). It investigates the essential functions of the brain, ranging from perception to thinking, and encompassing such areas as multi-perception, attention, memory, language, computation, heuristic search, reasoning, planning, decision-making, problem-solving, learning, discovery, and creativity. The goal of BI is to develop and demonstrate a systematic approach to achieving an integrated understanding of both macroscopic and microscopic level working principles of the brain, by means of experimental, computational, and cognitive neuroscience studies, as well as utilizing advanced Web Intelligence (WI) centric information technologies. BI represents a potentially revolutionary shift in the way that research is undertaken. It attempts to capture new forms of collaborative and interdisciplinary work. In this vision, new kinds of BI methods and global research communities will emerge, through infrastructure on the wisdom Web and knowledge grids that enables high speed and distributed, large-scale analysis and computations, and radically new ways of sharing data/knowledge.

BI 2009 was the first conference specifically dedicated to the interdisciplinary research in Brain Informatics. It provided an international forum to bring together researchers and practitioners from diverse fields, such as computer science, information technology, artificial intelligence, Web intelligence, cognitive science, neuroscience, medical science, life science, economics, data mining, data science and knowledge science, intelligent agent technology, human computer interaction, complex systems, and systems science, to present the state-of-the-art in the development of Brain Informatics, to explore the main research problems in BI that lie in the interplay between the studies of human brain and the research of informatics. On the one hand, one models and characterizes the functions of the human brain based on the notions of information processing systems. WI centric information technologies are applied to support brain science studies. For instance, the wisdom Web, knowledge grids, and cloud computing enable high-speed, large-scale analysis, simulation, and computation as well as new ways of sharing research data and scientific discoveries. On the other hand, informatics-enabled brain studies, e.g., based on fMRI, EEG, and MEG, significantly broaden the spectrum of theories and models of brain sciences and offer new insights into the development of human-level intelligence towards brain-inspired wisdom Web computing.

We wish to express our gratitude to all members of the Conference Committee for their instrumental and unflinching support. AMT 2009 and BI 2009 has a very exciting program with a number of features, ranging from keynote talks, special sessions, technical sessions, posters, workshop, and social programs. All of this work would not have been possible without the generous dedication of the Program Committee members and the external reviewers in reviewing the papers submitted to AMT 2009 and BI 2009, of our keynote speakers, John Anderson of Carnegie Mellon University, Jeffrey M. Bradshaw of Florida Institute for Human and Machine Cognition, Frank van Harmelen of Vrije Universiteit Amsterdam, Lynne Reder of Carnegie Mellon University, Zhongzhi Shi of Chinese Academy of Sciences, and Zhi-Hua Zhou of Nanjing University, and

organizers (Chen Li and Toyoaki Nishida) and invited speakers in the special session on Information Processing Meets Brain Sciences, Zhaoping Li of University College London, Setsuo Ohsuga of University of Tokyo, Bin Hu of Birmingham City University and Lanzhou University, Tianzi Jiang of Chinese Academy of Sciences, Yulin Qin of Beijing University of Technology and Carnegie Mellon University, as well as invited speakers in the special session on Conversational Informatics, and the special session on Human-Web Interaction, in preparing and presenting their very stimulating talks. We thank them for their strong support.

AMT 2009 and BI 2009 could not have taken place without the great team effort of the Local Organizing Committee and the support of the International WIC Institute, Beijing University of Technology. Our special thanks go to Boyuan Fan, Zhenyang Lu, Pu Wang, Baocai Yin, Jianwu Yang, Wenying Wu for their enormous efforts in planning and arranging the logistics of the conference from registration/payment handling, venue preparation, accommodation booking, to banquet/social program organization. We would like to thank Shuai Huang, Jiajin Huang, Jian Yang, and Juzhen Dong, of the conference support team at the International WIC Institute (WICI), the Knowledge Information Systems Laboratory, Maebashi Institute of Technology, and Web Intelligence Laboratory, Inc. for their dedication and hard work. We are very grateful to the AMT 2009 and BI 2009 corporate sponsors: Beijing University of Technology (BJUT), Beijing Municipal Lab of Brain Informatics, Chinese Society of Radiology, National Natural Science Foundation of China (NSFC), State Administration of Foreign Experts Affairs, Shanghai Psytech Electronic Technology Co. Ltd, Shenzhen Hanix United, Inc. Beijing Branch, Beijing JinShangQi Net System Integration Co. Ltd, and Springer Lecture Notes in Computer Science (LNCS/LNAI) for their generous support. Last but not the least, we thank Alfred Hofmann of Springer for his help in coordinating the publication of this special volume in an emerging and interdisciplinary research area.

**Jeffrey Bradshaw and Toyoaki Nishida**  
*AMT 2009 Conference General Chairs*

**Jiming Liu and Jinglong Wu**  
*AMT 2009 Program Chairs*

**Setsuo Ohsuga and Lin Chen**  
*BI 2009 Conference General Chairs*

**Ning Zhong and Kuncheng Li**  
*BI 2009 Program Chairs*

# AMT'09/BI'09 Program AT A GLANCE

On-site Registration    October 21, 15:30-17:30;    October 22-23, 08:30-18:00    [The third floor]				
Thursday October 22, 2009	09:00-09:20	<b>Conference Opening</b> [Grand Ballroom I, II and III]		
	09:20-10:20	<b>Keynote Talk</b> [Grand Ballroom I, II and III]    Chair: Jiming Liu <i>Using Neural Imaging to Inform the Instruction of Mathematics</i> by John Anderson		
	10:20-10:40	<b>Coffee Break</b>		
	10:40-11:40	<b>Keynote Talk</b> [Grand Ballroom I, II and III]    Chair: Setsuo Ohsuga <i>How Midazolam Can Help Us Understand Human Memory: 3 Illustrations and a Proposal for a New Methodology</i> by Lynne Reder		
	11:40-12:00	<b>Taking a Photograph</b>		
	12:00-14:00	<b>Conference Lunch</b> [Fusion Court, The first floor]		
	14:00	<b>BI Session - S1</b> [Grand Ballroom I] <i>Special Session on Information Processing Meets Brain Sciences</i> Chairs: Zhongzhi Shi & Kuncheng Li	<b>AMT Session - A1</b> [Grand Ballroom II] <i>Active Media Retrieval and Sharing</i> Chair: Wenbin Li	<b>AMT Session - A2</b> [Grand Ballroom III] <i>Multi-Agent Systems and Autonomy-Oriented Computing</i> Chair: Ruizhi Wang
	-			
	16:20			
	16:20-16:40	<b>Coffee Break</b>		
	16:40-18:00	<b>Poster Session</b>		
18:00-20:00	<b>Conference Reception</b> [Grand Ballroom, The third floor]			
Friday October 23, 2009	08:30-09:20	<b>Keynote Talk</b> [Grand Ballroom I, II and III]    Chair: Ning Zhong <i>Research on Brain-like Computer</i> by Zhongzhi Shi		
	09:20-10:10	<b>Keynote Talk</b> [Grand Ballroom I, II and III]    Chair: Toyoaki Nishida <i>Distributed Human-Machine Systems: Progress and Prospects</i> by Jeffrey M. Bradshaw		
	10:10-10:20	<b>Coffee Break</b>		
	10:20-11:10	<b>Keynote Talk</b> [Grand Ballroom I, II and III]    Chair: Jeffrey M. Bradshaw <i>Large Scale Reasoning on the Semantic Web: what to do when success is becoming a problem</i> by Frank van Harmelen		
	11:10-12:00	<b>Keynote Talk</b> [Grand Ballroom I, II and III]    Chair: Zhongzhi Shi <i>A Framework for Machine Learning with Ambiguous Objects</i> by Zhi-Hua Zhou		
	12:00-14:00	<b>Conference Lunch</b> [Fusion Court, The first floor]		
	14:00	<b>AMT Session - S2</b> [Grand Ballroom I] <i>Special Session on Conversational Informatics</i> Chair: Toyoaki Nishida	<b>BI Session - B1</b> [Grand Ballroom II] <i>Information Technologies for the Management and Use of Brain Data</i> Chair: Ning Zhong	<b>AMT Session - A3</b> [Grand Ballroom III] <i>Data Mining and Ontology Mining in Active Media</i> Chair: Zhi-Hua Zhou
	-			
	15:40			
	15:40-16:00	<b>Coffee Break</b>		
16:00	<b>AMT Session - S3</b> [Rose Room] <i>Special Session on Human-Web Interaction</i> Chair: Jeffrey M. Bradshaw	<b>BI Session - B2 (1)</b> [Jasmine Room] <i>Thinking and Perception-centric Investigations of Human Information Processing Systems</i> Chair: Jinglong Wu	<b>AMT Session - A4</b> [Grand Ballroom III] <i>Web Intelligence</i> Chair: Ruizhi Wang	
-				
18:00				
18:00-20:00	<b>Conference Banquet</b> [Grand Ballroom, The third floor]			
Saturday October 24, 2009	08:30	<b>AMT Session - A5</b> [Grand Ballroom I] <i>Networks and Security</i> Chair: Wenbin Li	<b>BI Session - B2 (2)</b> [Grand Ballroom II] <i>Thinking and Perception-centric Investigations of Human Information Processing Systems</i> Chair: Jinglong Wu	<b>BI Session - B3</b> [Grand Ballroom III] <i>Cognition-inspired Applications</i> Chair: Peipeng Liang
	-			
	09:50			
	09:50-10:20	<b>Coffee Break</b>		
10:20	<b>AMT Session - A6</b> [Grand Ballroom I] <i>Smart Digital Media</i> Chair: Jian Yang	<b>BI Session - B2 (3)</b> [Grand Ballroom II] <i>Thinking and Perception-centric Investigations of Human Information Processing Systems</i> Chair: Yulin Qin	<b>AMT Session - A7</b> [Grand Ballroom III] <i>Active Support Systems and Intelligent Interfaces</i> Chair: Haiyan Zhou	
-				
12:00				
12:00-14:00	<b>Conference Lunch</b> [Fusion Court, The first floor]			

# AMT'09/BI'09 Program

Thursday, October 22, 2009

## On-site Registration

**Time:** October 21, 15:30-17:30; October 22-23, 08:30-18:00

**Location:** The third floor

## Conference Opening (09:00--09:20)

**Location:** Grand Ballroom I, II and III, the third floor

**Welcome:** Zhenyang Lu (Vice President of Beijing University of Technology)

**Program Introduction:** Ning Zhong

**WIC Outstanding Contributions Award Ceremony:** Jiming Liu

## Keynote Talk (09:20 - 10:20)

**Chair:** Jiming Liu

**Location:** Grand Ballroom I, II and III

**Title:** Using Neural Imaging to Inform the Instruction of Mathematics

**Speaker:** John Anderson (Carnegie Mellon University, USA)

**Coffee Break (10:20-10:40)**

## Keynote Talk (10:40 - 11:40)

**Chair:** Setsuo Ohsuga

**Location:** Grand Ballroom I, II and III

**Title:** How Midazolam Can Help Us Understand Human Memory: 3 Illustrations and a Proposal for a New Methodology

**Speaker:** Lynne Reder (Carnegie Mellon University, USA)

**Taking a Photograph (11:40-12:00)**

**Conference Lunch (12:00 - 14:00)**

**Location:** Fusion Court, The first floor

## BI Session - S1 (14:00 - 16:20)

**Special Session on Information Processing Meets Brain Sciences**

**Chairs:** Zhongzhi Shi and Kuncheng Li

**Location:** Grand Ballroom I

- ◆ *Data Compression and Data Selection in Human Vision*, Zhaoping Li
- ◆ *How Were Intelligence and Language Created in Human Brain*, Setsuo Ohsuga
- ◆ *Affective Learning with an EEG Approach*, Bin Hu
- ◆ *Some Web Intelligence Oriented Brain Informatics Studies*, Yulin Qin
- ◆ *Do Brain Networks Correlate with Intelligence?* Tianzi Jiang

**AMT Session - A1 (14:00 - 16:20)**

**Active Media Retrieval and Sharing**

**Chair: Wenbin Li**

**Location: Grand Ballroom II**

- ◆ *Knowledge-based Concept Score Fusion for Multimedia Retrieval*, Manolis Falelakis, Lazaros Karydas, and Anastasios Delopoulos
- ◆ *Example-based Query Analysis using Functional Conceptual Graphs*, Hui Liu and Yuquan Chen
- ◆ *Checking Satisfactions of XML Referential Integrity Constraints*, Md. Sumon Shahriar and Jixue Liu
- ◆ *A Verification Method of Hyponymy between Chinese Terms Based on Concept Space*, Lei Liu, Sen Zhan, Luhong Diao, Shuying Yan, and Cungen Cao
- ◆ *Sharing Mobile Multimedia Annotations to Support Inquiry-based Learning using MobiTOP*, Khasfariyati Razikin, Dion Goh, Yin-Leng Theng, Quang Minh Nguyen, Thi Nhu Quynh Kim, Ee-Peng Lim, Chew Hung Chang, Kalyani Chatterjea, and Aixin Sun
- ◆ *Understanding Perceived Gratifications for Mobile Content Sharing and Retrieval in a Game-based Environment*, Chei Sian Lee, Dion Goh, Alton Chua, and Rebecca Ang
- ◆ *Why We Share: A Study of Motivations for Mobile Media Sharing*, Dion Goh, Rebecca Ang, Alton Chua, and Chei Sian Lee

**AMT Session - A2 (14:00 - 16:00)**

**Multi-Agent Systems and Autonomy-Oriented Computing**

**Chair: Ruizhi Wang**

**Location: Grand Ballroom III**

- ◆ *Enterprise Cluster Dynamics and Innovation Diffusion: a New Scientific Approach* Marco Remondino, Marco Pironti, and Pisano Paola
- ◆ *A Novel Application of Organic Plant Farming Analysis System - Using Game Theory and Multi-Agent Technique*, Chih-Yao Lo and Yu-Teng Chang
- ◆ *A Dynamic Trust Network for Autonomy-Oriented Partner Finding*, Hongjun Qiu, Jiming Liu, and Ning Zhong
- ◆ *Modeling an Educational Multi-Agent System in MaSE*, Izabella Salotti Braga Gago, Vera Werneck, and Rosa Costa
- ◆ *Enhancing Decentralized MAS-based Framework for Composite Web Services Orchestration and Exception Handling by Means of Mobile Agents Technology*, Mounira Ilahi, Zaki Brahmi, and Mohamed Mohsen Gammoudi
- ◆ *Multi-Objective Analysis on Optimization of Negotiation Support*, Yu-Teng Chang, Chih-Yao Lo, Ping-Chang Chen, and Shu-Huei Han

**Coffee Break (16:20 - 16:40)**

**Poster Session (16:40 - 18:00)**

**Conference Reception (18:00 - 20:00)**

**Location: Grand Ballroom, The third floor**

## Friday, October 23, 2009

### **Keynote Talk (08:30 - 09:20)**

**Chair:** Ning Zhong

**Location:** Grand Ballroom I, II and III

**Title:** Research on Brain-like Computer

**Speaker:** Professor Zhongzhi Shi (Chinese Academy of Sciences, China)

### **Keynote Talk (09:20 - 10:10)**

**Chair:** Toyooki Nishida

**Location:** Grand Ballroom I, II and III

**Title:** Distributed Human-Machine Systems: Progress and Prospects

**Speaker:** Dr. Jeffrey M. Bradshaw (Florida Institute for Human and Machine Cognition, USA)

### **Coffee Break (10:10 - 10:20)**

### **Keynote Talk (10:20 - 11:10)**

**Chair:** Jeffrey M. Bradshaw

**Location:** Grand Ballroom I, II and III

**Title:** Large Scale Reasoning on the Semantic Web: What to Do When Success Is Becoming a Problem

**Speaker:** Professor Frank van Harmelen (Vrije Universiteit Amsterdam, the Netherlands)

### **Keynote Talk (11:10 - 12:00)**

**Chair:** Zhongzhi Shi

**Location:** Grand Ballroom I, II and III

**Title:** A Framework for Machine Learning with Ambiguous Objects

**Speaker:** Professor Zhi-Hua Zhou (Nanjing University, China)

### **Conference Lunch (12:00 - 14:00)**

**Location:** Fusion Court, The first floor

### **AMT Session - S2 (14:00 - 15:40)**

#### **Special Session on Conversational Informatics**

**Chair:** Toyooki Nishida

**Location:** Grand Ballroom I

- ◆ *Implementing a Multi-user Tour Guide System with an Embodied Conversational Agent*, Aleksandra Cerekovic, Hsuan-Huang Huang, Takuya Furukawa, Yuji Yamaoka, Igor Pandzic, Toyooki Nishida, and Yukiko Nakano
- ◆ *Actively Adaptive Agent for Human-Agent Collaborative Task*, Yong Xu, Yoshimasa Ohmoto, Kazuhiro Ueda, Takanori Komatsu, Takeshi Okadome, Koji Kamei, Shogo Okada, Yasuyuki Sumi, and Toyooki Nishida
- ◆ *Low-Overhead 3D Items Drawing Engine for Communicating Situated Knowledge*, Loic Merckel and Toyooki Nishida
- ◆ *A Method to Detect Lies in Free Communication using Diverse Nonverbal Information: Towards an Attentive Agent*, Yoshimasa Ohmoto, Kazuhiro Ueda, and Takehiko Ohno
- ◆ *An Integrative Agent Model for Adaptive Human-Aware Presentation of Information During Demanding Tasks*, Andy van der Mee, Nataliya Mogles, and Jan Treur

**BI Session - B1 (14:00 - 15:20)**

**Information Technologies for the Management and Use of Brain Data**

**Chair: Ning Zhong**

**Location: Grand Ballroom II**

- ◆ *Data Explosion, Data Nature and Dataology*, Yangyong Zhu, Ning Zhong, and Yun Xiong
- ◆ *Reading What Machines “Think”*, Fabio Massimo Zanzotto and Danilo Croce
- ◆ *Using SVM to Predict High-level Cognition from fMRI Data: A Case Study of 4\*4 Sudoku Solving*, Jie Xiang, Junjie Chen, Haiyan Zhou, Yulin Qin, Kuncheng Li, and Ning Zhong
- ◆ *Data-Brain Modeling for Systematic Brain Informatics*, Jianhui Chen and Ning Zhong

**AMT Session - A3 (14:00 - 15:40)**

**Data Mining and Ontology Mining in Active Media**

**Chair: Zhi-Hua Zhou**

**Location: Grand Ballroom III**

- ◆ *Rough Set Based Personalized Recommendation in Mobile Commerce*, Lei Shi, Li Zhang, Xinming Ma, and Xiaohong Hu
- ◆ *SpamTerminator: A Personal Anti-Spam Add-in for Outlook*, Wenbin Li, Yiyang Cheng, Ning Zhong, Taifeng Liu, and Xindong Zhang
- ◆ *Image Search Clickthrough Data Is Better Than Text Search Clickthrough for Content Classification but Both Can Be Used to Classify Images*, Gavin Smith, Michael Antunovic, and Helen Ashman
- ◆ *A Novel Fast Inter Mode Decision Algorithm in H.264/AVC for Forest Fire Prevention Surveillance*, Chen Chen, Ning Han, Chunlian Yao, and Yuan Li
- ◆ *A Method for Analyzing Software Faults Based on Mining Outliers' Feature Attribute Sets*, Jiadong Ren, Changzhen Hu, Kunsheng Wang, and Di Wu

**Coffee Break (15:40 - 16:00)**

**AMT Session - S3 (16:00 - 18:00)**

**Special Session on Human-Web Interaction**

**Chair: Jeffrey M. Bradshaw**

**Location: Rose Room**

- ◆ *Consumer Decision Making in Knowledge-Based Recommendation*, Monika Mandl, Alexander Felfernig, and Monika Schubert
- ◆ *Incremental Learning of Triadic PLSA for Collaborative Filtering*, Hu Wu and Yongji Wang
- ◆ *Interactive Storyboard: Animated Story Creation on Touch Interfaces*, Kun Yu, Hao Wang, Chang Liu, and Jianwei Niu
- ◆ *Comparative Evaluation of Reliabilities on Semantic Search Functions: Auto-complete and Entity-centric Unified Search*, Hanmin Jung, Mi-Kyoung Lee, Beom-Jong You, and Do-Wan Kim
- ◆ *Integrated Recommender Systems Based on Ontology and Usage Mining*, Liang Wei and Song Lei

**BI Session - B2 (part 1) (16:00 - 17:40)**

**Thinking and Perception-centric Investigations of Human Information Processing Systems}**

**Chair: Jinglong Wu**

**Location: Jasmine Room**

- ◆ *Modelling the Reciprocal Interaction Between Believing and Feeling from a Neurological Perspective*, Zulfiqar Memon and Jan Treur
- ◆ *Information Hypothesis: On Human Information Capability Study*, Jiri Krajicek
- ◆ *Correlated Size Variations Measured in Human Visual Cortex V1/V2/V3 with functional MRI*, Tianyi Yan, Fengzhe Jin, and Jinglong Wu
- ◆ *Effects of Attention on Dynamic Emotional Expressions Processing*, Liang Zhang, Brigitte Roeder, and Kan Zhang
- ◆ *Simulating Human Heuristic Problem Solving: A Study by Combining ACT-R and fMRI Brain Image*, Rifeng Wang, Jie Xiang, Haiyan Zhou, Yulin Qin, and Ning Zhong

**AMT Session - A4 (16:00 - 18:00)**

**Web Intelligence**

**Chair: Ruizhi Wang**

**Location: Grand Ballroom III**

- ◆ *Unifying Web-scale Search and Reasoning from the Viewpoint of Granularity*, Yi Zeng, Yan Wang, Zhisheng Huang, and Ning Zhong
- ◆ *The Quest for Parallel Reasoning on the Semantic Web*, Peiqiang Li, Yi Zeng, Spyros Kotoulas, Jacopo Urbani, and Ning Zhong
- ◆ *A Model for Personalized Web-Scale Case Base Maintenance*, Jingyu Sun, Xueli Yu, Ruizhi Wang, and Ning Zhong
- ◆ *X3D-Based Web 3D Resources Integration and Reediting*, Zhoufan Zhou, Hisao Utsumi, and Yuzuru Tanaka
- ◆ *Providing Relevant Answers for Queries over E-commerce Web Databases*, Xin Li, Jun Zhang, and Liping Li
- ◆ *Detecting News Events from a Citizen Journalism Website using Tags*, Alton Chua, Dion Goh, and Khasfariyati Razikin

**Conference Banquet (18:00 - 20:00)**

**Location: Grand Ballroom, The third floor**

## Saturday, October 24, 2009

### AMT Session - A5 (08:30 - 09:50)

#### Networks and Security

Chair: Wenbin Li

Location: Grand Ballroom I

- ◆ *A New Mechanism for Job Scheduling in Computational Grid Network Environments*, Malarvizhi Nandagopal and Rhymend Uthariaraj
- ◆ *Efficient and Provably Secure Self-Certified Signature Scheme*, Jianhong zhang, Hua Chen, and Qin Geng
- ◆ *A Reversible Watermarking Scheme for 3D Meshes*, Dan Wu and Guozhao Wang
- ◆ *Neighbor-List Based Pairwise Key Management Scheme in Wireless Sensor Networks*, Xing Zhang, Jingsha He, and Qian Wei

### BI Session - B2 (part 2) (08:30 - 09:50)

#### Thinking and Perception-centric Investigations of Human Information Processing Systems

Chair: Jinglong Wu

Location: Grand Ballroom II

- ◆ *Evaluation of Probabilities and Brain Activity - An EEG-Study*, Ralf Morgenstern, Marcus Heldmann, Thomas Munte, and Bodo Vogt
- ◆ *Human Factors Affecting Decision in Virtual Operator Reasoning*, Lydie Edward, Domitile Lourdeaux, and Jean-Paul Barthes
- ◆ *The Effect of Information Forms and Floating Advertisements for Visual Search on Web Pages: An Eye-Tracking Study*, Mi Li, Jingjing Yin, Shengfu Lu, and Ning Zhong
- ◆ *EEG/ERP Meets ACT-R: A Case Study for Investigating Human Computation Mechanism*, Shinichi Motomura, Yuya Ojima, and Ning Zhong

### BI Session - B3 (08:30 - 09:50)

#### Cognition-inspired Applications

Chair: Peipeng Liang

Location: Grand Ballroom II

- ◆ *Combining the Objective Features with the Subjective Feelings in Personal Multi-alternative Decision Making Modeling*, Jiyun Li and Jerome R. Busemeyer
- ◆ *Automatic and Semi-automatic Approaches for Selecting Prominent Spatial Filters of CSP in BCI Applications*, Nakarin Suppakun and Songrit Maneewongvatana
- ◆ *Boosting Concept Discovery in Collective Intelligences*, Francesca Arcelli Fontana, Ferrante Raffaele Formato and Remo Pareschi
- ◆ *Segmentation of Heart Image Sequences Based on Human Way of Recognition*, Arkadiusz Tomczyk and Piotr Szczepaniak

### Coffee Break (09:50 - 10:20)

### AT Session - A6 (10:20 - 11:40)

#### Smart Digital Media

Chair: Jian Yang

Location: Grand Ballroom I

- ◆ *Using 6LowPAN UPnP and OSGi to Implement Adaptable Home Ambient Intelligence Network Platform*, Hui-bing Zhang and Jing-wei Zhang
- ◆ *Low Frequency Domain Aided Texture Synthesis for Intra Prediction*, Xiaowei Sun, Baocai Yin, and Yunhui Shi
- ◆ *A Novel Geometry Image Coding*, Yunhui Shi, Wen Wen, Baocai Yin, and Jijun Shi
- ◆ *Musical Style Classification Using Low Level Features*, Armando Buzzanca, Giovanna Castellano, and Anna Maria Fanelli

**BI Session - B2 (part 3) (10:20 - 11:40)**

**Thinking and Perception-centric Investigations of Human Information Processing Systems**

**Chair: Yulin Qin**

**Location: Grand Ballroom II**

- ◆ *Figural Effects of Syllogistic Reasoning in Conclusion-Evaluation Paradigm: An Eye-Movement Study*, Xiuqin Jia, Shengfu Lu, Ning Zhong, and Yiyu Yao
- ◆ *Structured Prior Knowledge and Granular Structures*, Qinrong Feng and Duoqian Miao
- ◆ *Multisensory Interaction of Audiovisual Stimuli on the Central and Peripheral Spatial Locations: A Behavioral Study*, Qi Li, Jingjing Yang, Noriyoshi Kakura, and Jinglong Wu
- ◆ *A Functional Model of Limbic System of Brain*, Takashi Kuremoto, Tomonori Ohta, Kunikazu Kobayashi, and Masanao Obayashi

**AMT Session - A7 (10:20 - 12:00)**

**Active Support Systems and Intelligent Interfaces**

**Chair: Haiyan Zhou**

**Location: Grand Ballroom III**

- ◆ *The Layout of Web Pages: A Study on the Relation between Information Forms and Locations Using Eye-tracking*, Mi Li, Yangyang Song, Shengfu Lu, and Ning Zhong
- ◆ *Human Characteristics on Length Perception with Three Fingers for Tactile Intelligent Interfaces*, Haibo Wang, Jinglong Wu, and Satoshi Takahashi
- ◆ *A Model and Environment for Improving Multimedia Intensive Reading Practices*, Thomas Bottini, Pierre Morizet-Mahoudeaux, and Bruno Bachimont
- ◆ *Study on Adaptive Computer-Assisted Instruction for In-Service Training*, Yu-Teng Chang, Chih-Yao Lo, and Ping-Chang Chen
- ◆ *Research on Recreational Sports Instruction Using an Expert System*, Chih-Yao Lo, Hsin-I Chang, and Yu-Teng Chang

**Conference Lunch (12:00 - 14:00)**

**Location: Fusion Court, The first floor**

## AMT'09/BI'09 Invited Talks

### **Title: Using Neural Imaging to Inform the Instruction of Mathematics**

PROFESSOR JOHN ANDERSON

Department of Psychology, Carnegie Mellon University

#### **Abstract**

I will describe research using fMRI to track the learning of mathematics with a computer-based algebra tutor. I will describe the methodological challenges in studying such a complex task and how we use cognitive models in the ACT-R architecture to interpret imaging data. I will also describe how we can use the imaging data to identify mental states as the student is engaged in algebraic problems solving.

#### **Biography**

John Anderson received his B.A. from the University of British Columbia in 1968 and his Ph.D. from Stanford University 1972. He has been at Carnegie Mellon University since 1978 where he is a professor of psychology and computer science, and Richard King Mellon University Professor of Psychology and Computer Science since 2001. He has been a member of National Academy of Sciences of USA and a fellow of American Academy of Arts and Sciences since 1999, and was Psychology Section Chair of National Academy of Sciences (2001-2004), He was also the president of Cognitive Science Society (1988-1989), and elected to the American Philosophical Society in 2007. He received various awards and prizes including American Psychological Association's Distinguished Scientific Career Award (1994); the David E. Rumelhart Prize for Contributions to the Formal Analysis of Human Cognition (2004); Howard Crosby Warren Medal for outstanding achievement in Experimental Psychology in the United States and Canada, Society of Experimental Psychology (2005); and Dr. A.H. Heineken Prize for Cognitive Science awarded by the Royal Netherlands Academy of Arts and Sciences (2006). He has published a number of influential books including Human Associative Memory (1973 with Gordon Bower), Language, Memory, and Thought (1976), The Architecture of Cognition (1983), The Adaptive Character of Thought (1990), Rules of the Mind (1993), The Atomic Components of Thought (1998), and How Can the Human Mind Occur in the Physical Universe? (2007). His current research is concerned with developing the ACT-R theory of cognition and involves two related enterprises. One effort is concerned with modeling the acquisition of intellectual competences with major foci being the dynamic problem solving skills such as in air traffic control and mathematical problem solving skills. This research is also tied into efforts to develop computer-based instructional systems. The second effort is concerned with using fMRI brain imaging to track different components of the cognitive architecture in the performance of complex tasks.

## **Title: How Midazolam Can Help Us Understand Human Memory: 3 Illustrations and a Proposal for a New Methodology**

PROFESSOR LYNNE REDER

Department of Psychology, Carnegie Mellon University

### **Abstract**

Midazolam is a benzodiazepine commonly used as an anxiolytic in surgery. A useful attribute of this drug is that it creates temporary, reversible, anterograde amnesia. Studies involving healthy subjects given midazolam in one session and saline in another, in a double-blind, cross-over design, provide insights into memory function. Several experiments will be described to illustrate the potential of studying subjects with transient anterograde amnesia. This talk will also outline how this drug can be used in combination with fMRI to provide more insights about brain functioning than either method in isolation.

### **Biography**

Lynne Reder received her B.A. from Stanford University in 1972 and her Ph.D. from the University of Michigan in 1976. She has been at Carnegie Mellon University since 1978 where she is a professor of psychology since 1992. She is a fellow of the American Psychological Association, the American Association for the Advancement of Science, and the Association for Psychological Science. The overarching theme in her research is to further our understanding of human memory which is at the heart of virtually all other psychological processes and behaviors. She was a leader in demonstrating that people are adaptive in selecting among different strategies to answer questions and solve problems. A major focus in her lab concerns how information is acquired and retrieved in different situations. She uses a variety of methodologies including computational modeling, behavioral studies that measure accuracy and latency, psychopharmacological interventions (using midazolam that creates temporary anterograde amnesia), functional magnetic resonance imaging (fMRI) and event related potentials (ERP).

## **Title: Research on Brain-like Computer**

PROFESSOR ZHONGZHI SHI

Key Laboratory of Intelligent Information Processing

Institute of Computing Technology, Chinese Academy of Sciences

### **Abstract**

After more than 60 years of development, the operation speed of computer is up to several hundred thousand billion times, but its intelligence level is extremely low. Studying machine which combines high performance and human high intelligence together becomes the effective way with high capacity and efficiency of exploring information processing. It will bring the important impetus to economic and social sustainable development, promotion of the information industry and so on to make breakthrough in the research of brain-like computer. Mind is all mankind's spiritual activities, including emotion, will, perception, consciousness, representation, learning, memory, thinking, intuition, etc. Mind model is for explaining what individuals operate in the cognitive process for some thing in the real world. It is the internal sign or representation for external realistic world. If the neural network is a hardware of the brain system, then the mind model is the software of the brain system. The key idea in cognitive computing is to set up the mind model of the brain system, and then building brain-like computer in engineering through structure, dynamics, function and behavioral reverse engineering of the brain. This talk will introduce the research progress of brain-like computer, mainly containing intelligence science, mind model, neural column, and architecture.

### **Biography**

Zhongzhi Shi is a professor at the Institute of Computing Technology, the Chinese Academy of Sciences, leading the Research Group of Intelligence Science. His research interests include intelligence science, multiagent systems, semantic Web, machine learning and neural computing. Professor Shi has published 13 monographs, 14 books and more than 400 research papers in journals and conferences. He has won a 2nd-Grade National Award at Science and Technology Progress of China in 2002, two 2nd-Grade Awards at Science and Technology Progress of the Chinese Academy of Sciences in 1998 and 2001, respectively. He is a senior member of IEEE, member of AAAI and ACM, Chair for the WG 12.2 of IFIP. He serves as Vice President for Chinese Association of Artificial Intelligence.

**Title: Distributed Human-Machine Systems: Progress and Prospects**

Dr. JEFFREY M. BRADSHAW

Florida Institute for Human and Machine Cognition (IHMC)

**Abstract**

Advances in neurophysiological and cognitive science research have fueled a surge of research aimed at more effectively combining human and machine capabilities. In this talk we will give an overview of progress and prospects for four current thrusts of technology development resulting from this research: brain-machine interfaces, robotic prostheses and orthotics, cognitive and sensory prostheses, and software and robotic assistants. Following the overview, we will highlight the unprecedented social ethics issues that arise in the design and deployment of such technologies, and how they might be responsibly considered and addressed.

**Biography**

Dr. Jeffrey M. Bradshaw is a Senior Research Scientist at the Florida Institute for Human and Machine Cognition (IHMC) where he leads the research group developing the KAoS policy and domain services framework. Formerly, he led research groups at The Boeing Company and the Fred Hutchinson Cancer Research Center. He has been a Fulbright Senior Scholar at the European Institute for Cognitive Sciences and Engineering (EURISCO) in Toulouse, France; an Honorary Visiting Researcher at the Center for Intelligent Systems and their Applications and AIAI at the University of Edinburgh, Scotland; a visiting professor at the Institute Cognitique at the University of Bordeaux; is former chair of ACM SIGART; and former chair of the RIACS Science Council for NASA Ames Research Center. He served as a member of the National Research Council (NRC) Committee on Military and Intelligence Methodology for Emergent Physiological and Cognitive/ Neural Science Research in the Next Two Decades and as a scientific advisor to the Japanese NEC Technology Paradigm Shifts initiative. He currently serves as an advisor to the HCI and Visualization program at the German National AI Research Center (DFKI), and an external advisory board member of the Cognitive Science and Technology Program at Sandia National Laboratories. He is a member of the Technical Committee for IEEE Systems, Man and Cybernetics, the IFIP Working Group on HCI and Visualization, and for the Aerospace Human Factors and Ergonomics of the IEA. Recently, he served as co-program chair for Intelligent User Interfaces (IUI 2008) and as Program Vice Chair, 2008 IEEE International Conference on Distributed Human-Machine Systems (DHMS 2008). He is co-chair for the 2009 Human-Agent-Robot Teamwork Workshop, co-located with the International Conference on Human-Robotic Interaction. Dr. Bradshaw serves on the Board of Directors of the International Foundation for Autonomous Agents and Multiagent Systems and is a member of the Parametric Human Consortium. He is on the editorial board of the Journal of Autonomous Agents and Multi-Agent Systems, the Web Semantics Journal, *Schedae Informaticae*, and the Web Intelligence Journal, and was formerly on the board of the Knowledge Acquisition Journal and the International Journal of Human-Computer Studies. He led the DARPA and NASA funded ITAC study team "Software Agents for the Warfighter" and has participated in NASA Blue Sky Study Groups for the Human-Centered Vision of Mars Exploration (BHV) and for the Small Pressurized Rover (BSR). From 2002-2006, KAoS was used as part of a NASA series of annual two-week field tests of human-robot teams performing simulated planetary surface exploration at the Mars Desert Research Station in the Utah desert. Jeff was sponsored by DHS to undertake detailed simulation studies of the use of human-robot teams to secure facilities at Port Everglades. He has also led the ONR-sponsored NAIMT and Coordinated Operations projects where a team of humans and heterogeneous robots performed field exercises at the Naval Air Station in Pensacola, aimed at port reconnaissance, and robot-assisted detection and apprehension of intruders. Among hundreds of other publications, he edited the books Knowledge Acquisition as a Modeling Activity (with Ken Ford, Wiley, 1993), Software Agents (AAAI Press/The MIT Press, 1997).

## **Title: Large Scale Reasoning on the Semantic Web: what to do when success is becoming a problem**

PROFESSOR FRANK VAN HARMELEN  
AI Department, Vrije Universiteit Amsterdam

### **Abstract**

In recent years, the Semantic Web has seen rapid growth in size (many billions of facts and rules are now available) and increasing adoption in many sectors (government, publishing industry, media). This success has brought with it a whole new set of problems: storage, querying and reasoning with billions of facts and rules that are distributed across different locations. The Large Knowledge Collider (LarKC) is providing an infrastructure to solve such problems. LarKC exploits parallelisation, distribution and approximation to enable Semantic Web reasoning at arbitrary scale. In this presentation we will describe the architecture and implementation of the Large Knowledge Collider, we will give data on its current performance, and we will describe a number of use-cases that are deploying LarKC.

### **Biography**

Frank van Harmelen (1960) is a professor in Knowledge Representation & Reasoning in the AI department (Faculty of Science) at the Vrije Universiteit Amsterdam. After studying mathematics and computer science in Amsterdam, he moved to the Department of AI in Edinburgh, where he was awarded a PhD in 1989 for his research on meta-level reasoning. While in Edinburgh, he co-developed a logic-based toolkit for expert systems, and worked with Prof. Alan Bundy on proof planning for inductive theorem proving. After his PhD research, he moved back to Amsterdam where he worked from 1990 to 1995 in the SWI Department under Prof. Wielinga, on the use of reflection in expert systems, on the formal underpinnings of the CommonKADS methodology for Knowledge-Based Systems. In 1995 he joined the AI research group at the Vrije Universiteit Amsterdam, where he co-lead the On-To-Knowledge project, one of the first Semantic Web projects. He was appointed full professor in 2002, and is leading the Knowledge Representation and Reasoning Group. He was one of the co-designers of the OWL Web Ontology Language. He is currently scientific director the LarKC project (<http://www.larkc.eu>), aiming to develop the Large Knowledge Collider, a platform for very large scale semantic web reasoning. His interests include approximate reasoning, Semantic Web, medical protocols. He has published three books (on meta-level inference, on knowledge-based systems, and on the Semantic Web) and over 100 research papers, most of which can be found on-line.

## **Title: A Framework for Machine Learning with Ambiguous Objects**

PROFESSOR ZHI-HUA ZHOU

National Key Laboratory for Novel Software Technology, Nanjing University, China

### **Abstract**

Machine learning tries to improve the performance of the system automatically by learning from experiences, e.g., objects or events given to the system as training samples. Generally, each object is represented by an instance (or feature vector) and is associated with a class label indicating the semantic meaning of that object. For ambiguous objects which have multiple semantic meanings, traditional machine learning frameworks may be less powerful. This talk will introduce a new framework for machine learning with ambiguous objects.

### **Biography**

Zhi-Hua Zhou is currently Cheung Kong Professor and Founding Director of the LAMDA group affiliated with both the Department of Computer Science & Technology and the National Key Laboratory for Novel Software Technology at Nanjing University, China. He has wide research interests, mainly including artificial intelligence, machine learning, data mining, pattern recognition and information retrieval. In these areas he has published over 70 papers in leading journals and conferences. He has won various awards or honors. He is an associate editor-in-chief of, associate editor of, and on the editorial boards of (Elsevier), (IOS), (Springer), , etc. He is the founder of the ACML conference, Steering Committee member of PAKDD and PRICAI, program committee chair/co-chair of PAKDD'07, PRICAI'08 and ACML'09, vice chair or area chair of IEEE ICDM'06, IEEE ICDM'08, SIAM DM'09, ACM CIKM'09, etc. He is the chair of the CAAI (Chinese Association of Artificial Intelligence) Machine Learning Society, vice chair of the CCF (China Computer Federation) Artificial Intelligence & Pattern Recognition Society and chair of the IEEE Computer Society Nanjing Chapter.

## BI '09 Special Session

### Special Session on Information Processing Meets Brain Sciences

- Data Compression and Data Selection in Human Vision  
*Zhaoping Li (University College London, UK)*
- Do Brain Networks Correlate with Intelligence?  
*Tianzi Jiang (Institute of Automation, Chinese Academy of Sciences, China)*
- How Were Intelligence and Language Created in Human Brain  
*Setsuo Ohsuga (University of Tokyo, Japan)*
- Affective Learning with an EEG Approach  
*Bin Hu (Birmingham City University, UK, and Lanzhou University, China)*
- Some Web Intelligence Oriented Brain Informatics Studies  
*Yulin Qin (Beijing University of Technology, China, and Carnegie Mellon University, USA)*

## AMT'09 Special Sessions

### Special Session on Conversational Informatics

- Implementing a Multi-user Tour Guide System with an Embodied Conversational Agent  
*Aleksandra Cerekovic, Hsuan-Huang Huang, Takuya Furukawa, Yuji Yamaoka, Igor Pandzic, Toyoaki Nishida, and Yukiko Nakano*
- Actively Adaptive Agent for Human-Agent Collaborative Task  
*Yong Xu, Yoshimasa Ohmoto, Kazuhiro Ueda, Takanori Komatsu, Takeshi Okadome, Koji Kamei, Shogo Okada, Yasuyuki Sumi and Toyoaki Nishida*
- Low-Overhead 3D Items Drawing Engine for Communicating Situated Knowledge  
*Loic Merckel and Toyoaki Nishida*
- A Method to Detect Lies in Free Communication using Diverse Nonverbal Information: Towards an Attentive Agent  
*Yoshimasa Ohmoto, Kazuhiro Ueda, and Takehiko Ohno*
- An Integrative Agent Model for Adaptive Human-Aware Presentation of Information During Demanding Tasks  
*Andy van der Mee, Nataliya Mogles, and Jan Treur*

### Special Session on Human-Web Interaction

- Consumer Decision Making in Knowledge-Based Recommendation  
*Monika Mandl, Alexander Felfernig, and Monika Schubert*
- Incremental Learning of Triadic PLSA for Collaborative Filtering  
*Hu Wu and Yongji Wang*
- Interactive Storyboard: Animated Story Creation on Touch Interfaces  
*Kun Yu, Hao Wang, Chang Liu, and Jianwei Niu*
- Comparative Evaluation of Reliabilities on Semantic Search Functions: Auto-complete and Entity-centric Unified Search  
*Hanmin Jung, Mi-Kyoung Lee, Beom-Jong You, and Do-Wan Kim*
- Integrated Recommender Systems Based on Ontology and Usage Mining  
*Liang Wei and Song Lei*

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# Map of Conference Venue

