

2011 International Conference on Active Media Technology
2011 International Conference on Brain Informatics

Final Program

AMT'11 and BI'11

September 7-9, 2011

Yi Fu Science Hall

**The School of Information Science and Engineering
Lanzhou University
Lanzhou, China**

<http://wi-consortium.org/conferences/amtbi11/>

Co-organized by:

Web Intelligence Consortium (WIC)

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



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Message from the Conference and Program Chairs

We are pleased to give you a warm welcome to the 2011 International Joint Conference on Active Media Technology and Brain Informatics (AMT 2011 and BI 2011). On behalf of the AMT 2011 and BI 2011 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 2011 and BI 2011 conferences are organized by the 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 2011 marked the sixth 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, AMT 2006 in Brisbane, Australia, AMT 2009 in Beijing, China, and AMT 2010 in Toronto, Canada). All these have once again confirmed our vision back in 2001 to capture and document the evolution unfolding in our digital era. AMT 2011 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 2011 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 2011 and BI 2011 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 2011 and BI 2011, of our keynote speakers, Lin Chen of Chinese Academy of Sciences, Ali Ghorbani of University of New Brunswick, Toyooki Nishida of Kyoto University, Frank Hsu of Fordham University, Zhongtuo Wang of Dalian University of Technology

and Yulin Qin of International WIC Institute/BJUT and CMU, and workshop organizer (Xijin Tang of Chinese Academy of Sciences) and special session organizer (Hanmin Jung of Pohang University of Science and Technology). We thank them for their strong support.

AMT 2011 and BI 2011 could not have taken place without the great team effort of the Local Organizing Committee and the support of the International WIC Institute, Lanzhou University. We would like to thank Li Liu, Juzhen Dong, and Yi Zeng, 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 2011 and BI 2011 corporate sponsors: Lanzhou University (LZU), National Natural Science Foundation of China (NSFC), ALDEBARAN Robotic CO. Ltd, Shenzhen Hanix United, ISEN TECH&TRAD CO, LTD, Academy of Mathematics and Systems Science/Chinese Academy of Sciences 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.

Ali A. Ghorbani and Bin Hu
AMT 2011 Conference General Chairs

Ning Zhong and Vic Callaghan
AMT 2011 Program Chairs

Lin Chen and Ning Zhong
BI 2011 Conference General Chairs

Bin Hu and Jiming Liu
BI 2011 Program Chairs

AMT'11/BI'11 Program AT A GLANCE

On-site Registration September 6, 15:30-17:30; September 7-9, 08:30-18:00 [Feiyunlou Building]						
Wednesday September 7, 2011	09:00-09:20 Conference Opening [Yifu Science Hall main lecture hall]					
	09:20-10:10 Keynote Talk [Yifu Science Hall main lecture hall] Chair: Bin Hu <i>The Global-first Topological Definition of Perceptual Objects, and Its Neural Correlation in Anterior Temporal Lobe</i> by Lin Chen					
	10:10-10:30 Coffee Break					
	10:30-11:20 Keynote Talk [Yifu Science Hall main lecture hall] Chair: Bin Hu <i>Towards Conversational Artifacts</i> by Toyoaki Nishida					
	11:20-11:50 Taking a Photograph					
	12:00-14:00 Conference Lunch [TBD]					
	14:00-14:30 Special Tech Talk [Yifu Science Hall main lecture hall] Chair: Li Liu <i>Humanoid robotics for Services</i> by Qingyi Lelay					
	14:30-15:00 Special Invited Talk [Yifu Science Hall main lecture hall] Chair: Li Liu <i>fMRI Principle and Clinical Applications</i> by Kun Cheng Li					
	15:00-15:20 Coffee Break					
	15:20 - 17:30	BI Session - W1 [Yifu Science Hall 201] <i>Workshop on Meta-Synthesis and Complex Systems</i> Chair: Xijin Tang	AMT Session - A1(1) [Yifu Science Hall 202] <i>Data Mining and Pattern Analysis in Active Media</i> Chair: Yi Zeng	AMT Session – A4(1) [Yifu Science Hall 203] <i>Active Multi-Agent and Network Systems</i> Chair: Toyoaki Nishida	Special Workshop [Yifu Science Hall 204] <i>Workshop on Humanoid Robot for Research in Brain Science</i> Chair: Qingyi LELAYs	
18:00-20:00 Conference Reception [TBD]						
Thursday September 8, 2011	08:30-09:20 Keynote Talk [Yifu Science Hall main lecture hall] Chair: Ning Zhong <i>Study of System Intuition By Noetic Science Founded by QIAN Xuesen</i> by Zhongtuo Wang					
	09:20-10:10 Keynote Talk [Yifu Science Hall main lecture hall] Chair: Ning Zhong <i>Study of Problem Solving Following Herbert Simon</i> by Yulin Qin					
	10:10-10:30 Coffee Break					
	10:30 - 12:00	AMT Session – A4(2) [Yifu Science Hall 201] <i>Active Multi-Agent and Network Systems</i> Chair: Yi Zeng	BI Session – B2(1) [Yifu Science Hall 202] <i>Cognition-inspired Applications</i> Chair: Frank Hsu	AMT Session – B3(1) [Yifu Science Hall 203] <i>Thinking and Perception-centric Investigations of Human Information Processing Systems</i> Chair: Yulin Qin	Special Workshop [Yifu Science Hall 204] <i>Workshop on Humanoid Robot for Research in Brain Science</i> Chair: Qingyi LELAYs	
	12:00-14:00 Conference Lunch [Fusion Court, The first floor]					
	14:00 - 15:40	BI Session - W2 [Yifu Science Hall 201] <i>Workshop on Meta-Synthesis and Complex Systems</i> Chair: Xijin Tang	BI Session - B1 [Yifu Science Hall 202] <i>Information Technologies for the Management and Use of Brain Data</i> Chair: Ning Zhong	AMT Session – A1(2) [Yifu Science Hall 203] <i>Data Mining and Pattern Analysis in Active Media</i> Chair: Jiming Liu		
	15:40-16:00 Coffee Break					
	16:00 - 18:00	AMT Session – S1 [Yifu Science Hall 201] <i>Special Session on Technology Intelligence</i> Chair: Hanmin Jung	BI Session - B2 (2) [Yifu Science Hall 202] <i>Cognition-inspired Applications</i> Chair: Lars Schwabe	AMT Session – A3(1) [Yifu Science Hall 203] <i>Active Web Intelligence Applications</i> Chair: Jiming Liu		
	18:00-20:00 Conference Banquet [Grand Ballroom, The third floor]					

Conference Program

Friday September 9, 2011	08:30-09:20	Keynote Talk [Yifu Science Hall main lecture hall] Chair: Jiming Liu <i>People's Opinion, People's Nexus, People's Security and Computational Intelligence: the Evolution Continues</i> by Ali Ghorbani		
	09:20-10:10	Keynote Talk [Yifu Science Hall main lecture hall] Chair: Jiming Liu <i>Combinatorial Fusion Analysis in Brain Informatics: Gender variation in facial attractiveness judgment</i> by D.Frank Hsu		
	Coffee Break			
	10:30 - 12:00	AMT Session - A2 [Yifu Science Hall 201] <i>Active Human-Web Interaction and Social Media</i> Chairs: Li Liu	BI Session – B3(2) [Yifu Science Hall 202] <i>Thinking and Perception-centric Investigations of Human Information Processing Systems</i> Chair: Haiyan Zhou	AMT Session – A3(2) [Yifu Science Hall 203] <i>Active Web Intelligence Applications</i> Chair: Yi Zeng
	Conference Lunch [TBD]			

AMT'11/BI'11 Program

Wednesday, September 7, 2011

On-site Registration

Time: September 6, 15:30-17:30; September 7-8, 08:30-18:00

Location: Fei Yun Lou Building

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

Location: Yi Fu Science Hall main lecture hall

Welcome: Bin Hu

Program Introduction: Bin Hu

Keynote Talk (09:20 - 10:10)

Chair: Bin Hu

Location: Yi Fu Science Hall main lecture hall

Title: The Global-first Topological Definition of Perceptual Object, and Its Neural Correlation in Anterior Temporal Lobe

Speaker: Lin Chen (Chinese Academy of Sciences, China)

Coffee Break (10:10-10:30)

Keynote Talk (10:30 - 11:20)

Chair: Bin Hu

Location: Yi Fu Science Hall main lecture hall

Title: Towards Conversational Artifacts

Speaker: Toyoaki Nishida (Kyoto University, Japan)

Taking a Photograph (11:20-11:50)

Conference Lunch (12:00 - 14:00)

Location: TBD

Special Tech Talk (14:00 - 14:30)

Chair: Li Liu

Location: Yi Fu Science Hall main lecture hall

Title: Humanoid Robotics for Services

Speaker: Qingyi LELAY (ALDEBARAN Robotics, France)

Special Invited Talk (14:30 - 15:00)

Chair: Li Liu

Location: Yi Fu Science Hall main lecture hall

Title: fMRI Principle and Clinical Applications

Speaker: Kuncheng Li

Coffee Break (15:00-15:20)

BI Session - W1 (15:20 - 17:30)

Workshop on Meta-Synthesis and Complex Systems

Chairs: Xijin Tang

Location: Yifu Science Hall 201

- ◆ *Evaluation and Recommendation Methods Based on Graph Model*, Yongli Li
- ◆ *An Improved EDP Algorithm to Privacy Protection in Data Mining*, Ming-Zheng Wang
- ◆ *A Hybrid Multiple Attributes Two-sided Matching Decision Making Method with Incomplete Weight Information*, Zhen Zhang
- ◆ *A New Linguistic Aggregation Operator and its Application*, Cuiping Wei

AMT Session - A1(part 1) (15:20 - 17:30)

Data Mining and Pattern Analysis in Active Media

Chair: Yi Zeng

Location: Yifu Science Hall 202

- ◆ *A Heuristic Classifier Ensemble for Huge Data*, Hamid Parvin, Behrouz Minaei, and Hosein Alizadeh
- ◆ *Ontology Extraction and Integration from Semi-structured Data*, Shaobo Wang, Yi Zeng, and Ning Zhong
- ◆ *Effectiveness of Video Ontology in Query by Example Approach*, Md. Sumon Shahriar and Jixue Liu
- ◆ *A Survey of Energy Conservation, Routing and Coverage in Wireless Sensor Networks*, Bin Wang, Wenxin Li, and Li Liu

AMT Session – A4(part 1) (15:20 - 17:30)

◆ Active Multi-Agent and Network Systems

◆ Chairs: Toyoaki Nishida

◆ Location: Yifu Science Hall 203

- ◆ *Estimating the Density of Brown Plant Hoppers from a Light-traps Network Based on Unit Disk Graph*, Viet Xuan Truong, Hiep Xuan Huynh, Minh Ngoc Le, and Alexis Drogoul
- ◆ *Modelling the Behaviour of Crowds in Panicked Conditions*, Jake Wendt, Guangzhi Qu, and Jianwei Niu
- ◆ *How To Play Well in Non-Zero Sum Games: Some Lessons from Generalized Travelers Dilemma*, Predrag Tosic and Philip Dasler
- ◆ *Key Distribution Protocol for Secure Multicast with Reduced Communication Delay*, P. Vijayakumar, S. Bose, A. Kannan, P.H. Himesh

Special Workshop (15:20 - 17:30)

Organized by ALDEBARAN Robotics, Paris, France

Workshop on Humanoid Robot for Research in Brain Science

Chairs: Qingyi LELAYS

Location: Yifu Science Hall 204

Conference Reception (18:00 - 20:00)

Location: TBD

Thursday, September 8, 2011

Keynote Talk (08:30 - 09:20)

Chair: Ning Zhong

Location: Yi Fu Science Hall main lecture hall

Title: Study of System Intuition by Noetic Science Founded by QIAN Xuesen

Speaker: Zhongtuo Wang (Dalian University of Technology, China)

Keynote Talk (09:20 - 10:10)

Chair: Ning Zhong

Location: Yi Fu Science Hall main lecture hall

Title: Study of Problem Solving Following Herbert Simon

Speaker: Yulin Qin (International WIC Institute/BJUT, and Department of Psychology/CMU)

Coffee Break (10:10 - 10:30)

AMT Session – A4(part 2) (10:30 - 12:00)

Active Multi-Agent and Network Systems

♦ **Chairs: Yi Zeng**

♦ **Location: Yifu Science Hall 201**

- ♦ *Programming Large-Scale Multi-Agent Systems Based on Organization Metaphor*, Cuiyun Hu, Xinjun Mao, Yuekun Sun, and Huiping Zhou
- ♦ *A Framework for Context-Aware Digital Signage*, Ichiro Satoh
- ♦ *EMTAN: A Web-Based Multi-Agent System Architecture for Input Automation*, Ming-Jui Huang, Cheng-Tao Chuang, Kai-Hsiang Yang, and Cheng-Yuan Liou

BI Session – B3 (part 1) (10:30 - 12:00)

♦ **Cognition-inspired Applications**

♦ **Chairs: Frank Hsu**

♦ **Location: Yifu Science Hall 202**

- ♦ *Fundamental Study for Human Brain Activity Based on the Spatial Cognitive Task*, Shunji Shimizu, Noboru Takahashi, Yukihiro Hirata,
- ♦ *ABSO: Advanced Bees Swarm Optimization Metaheuristic and Application to Weighted MAX-SAT Problem*, Souhila Sadeg, Habiba Drias, Ouassim Ait El hara, and Ania Kaci
- ♦ *Investigation into Stress of Mothers with Mental Retardation Children Based on EEG (Electroencephalography) and Psychology Instruments*, Wen Zhao, Li Liu, Fang Zheng, Dangping Fan, Xuebin Chen,

BI Session – B1(part 1) (10:30 - 12:00)

Thinking and Perception-Centric Investigations of Human Information Processing Systems

♦ **Chairs: Yulin Qin**

♦ **Location: Yifu Science Hall 203**

- ♦ *Cognition According to the Ouroboros Model*, Knud Thomsen
- ♦ *Dynamic Relations between Naming and Acting in Adult Mental Retardation*, Sabine Metta and Josiane Caron-Pargue
- ♦ *The Role of Lateral Inferior Prefrontal Cortex during Information Retrieval*, Haiyan Zhou, Jieyu Liu, Wei Jing, Yulin Qin, Shengfu Luyi Yao, and Ning Zhong
- ♦ *Dissociations in Limbic Lobe and Sub-lobar Contributions to Memory Encoding and Retrieval of Social Statistical Information*, Mi Li, Shengfu Lu, Jiaojiao Li, and Ning Zhong

Special Workshop (10:30 - 12:00)

♦ **Organized by ALDEBARAN Robotics, Paris, France**
Workshop on Humanoid Robot for Research in Brain Science
Chairs: Qingyi LELAYS
Location: Yifu Science Hall 204

Conference Lunch (12:00 - 14:00)
Location: Fusion Court, The first floor

BI Session - W2 (14:00 - 15:40)

- ♦ **Workshop on Meta-Synthesis and Complex Systems**
- ♦ **Chairs: Xijin Tang**
- ♦ **Location: Yifu Science Hall 201**
- ♦ *Group Polarization and Non-positive Social Influence: A Revised Voter Model Study*, Zhenpeng LI and Xijin Tang
- ♦ *On-demand Dynamic Recommendation Mechanism in Support of Enhancing Idea Creativity for Group Argumentation*, Xi Xia and Xiaoji Zhou
- ♦ *Utilizing Knowledge Based Mechanisms in Automated Feature Recognition Processes*, Hao Lan Zhang and Christian Van der Velden
- ♦ *The Order Measure Model of Knowledge Structure*, Qiu Jiangnan, Wang Chunling, and Qin Xuan

BI Session – B2 (14:00 - 15:40)

Information Technologies for the Management, Analysis and Use of Brain Data

- ♦ **Chairs: Ning Zhong**
- ♦ **Location: Yifu Science Hall 202**
- ♦ *Robust and Stable Small-World Topology of Brain Intrinsic Organization During Pre- and Post-Task Resting States*, Zhijiang Wang, Jiming Liu, Ning Zhong, Yulin Qin, Haiyan Zhou, and Kuncheng
- ♦ *Exploring Functional Connectivity Networks in fMRI Data Using Clustering Analysis*, Dazhong Liu, Ning Zhong, and Yulin Qin
- ♦ *An Efficient Method for Odor Retrieval*, Tsuyoshi Takayama, Shigeru Kikuchi, Yoshitoshi Murata, Nobuyoshi Sato, and Tetsuo Ikeda
- ♦ *Multiplying the Mileage of Your Dataset with Subwindowing*, Adham Atyabi, Sean P. Fitzgibbon, and David M. W. Powers

AMT Session – A1(part 2) (14:00 - 15:40)

Data Mining and Pattern Analysis in Active Media

- ♦ **Chairs: Jiming Liu**
- ♦ **Location: Yifu Science Hall 203**
- ♦ *A Multi-type Indexing CBVR System Constructed with MPEG-7 Visual Features*, Yin-Fu Huang and He-Wen Chen
- ♦ *A Novel Data Collection Scheme Based on Active Degree for OMSN*, Jianwei Niu, Bin Dai, and Jinkai Guo
- ♦ *Research of Robust Facial Expression Recognition under Facial Occlusion Condition*, Bin Jiang and Ke-bin Jia

Coffee Break (15:40 - 16:00)

AMT Session – S1 (16:00 - 18:00)

Special Session on Technology Intelligence

◆ **Chairs: Hanmin Jung**

◆ **Location: Yifu Science Hall 201**

- ◆ *Smart Searching System for Virtual Science Brain*, Hong-woo Chun, Chang-hoo Jeong, Sa-kwang Song, Yunsoo Choi, Doheon Jeong, Sung-pil Choi, and Won-Kyung Sung
- ◆ *Using Semantic Web Technologies for Technology Intelligence Services pages*, Seungwoo Lee, Mikyoung Lee, Hanmin Jung, Pyung Kim, Dongmin Seo, Tae Hong Kim, Jinhee Lee, and Won-Kyung Sung
- ◆ *Procedural Knowledge Extraction on MEDLINE Abstracts*, Sa-kwang Song, Heung-seon Oh, Sung Hyon Myaeng, Sung-pil Choi, Hong-woo Chun, Yunsoo Choi, and Chang-hoo Jeong

BI Session – B3 (part 2) (16:00 - 17:40)

Cognition-inspired Applications

◆ **Chairs: Lars Schwabe**

◆ **Location: Yifu Science Hall 202**

- ◆ *Formal Specification of a Neuroscience-Inspired Cognitive Architecture pages*, Luis-Felipe Rodriguez and Felix Ramos
- ◆ *Computational Modeling of Brain Processes for Agent Architectures: Issues and Implications*, Luis-Felipe Rodriguez, Felix Ramos, and Gregorio Garcia
- ◆ *Analysis of Gray Matter in AD Patients and MCI Subjects Based Voxel-Based Morphometry*, Zhijun Yao, Bin Hu, Lina Zhao, and Chuanjiang Liang

AMT Session – A3(part 1) (16:00 - 18:00)

Active Web Intelligence Applications

◆ **Chairs: Jiming Liu**

◆ **Location: Yifu Science Hall 203**

- ◆ *Hot Topic Detection in Professional Blogs*, Erzhong Zhou, Ning Zhong, and Yuefeng Li
- ◆ *A Weighted Multi-Factor Algorithm for Microblog Search*, Lulin Zhao, Yi Zeng, and Ning Zhong
- ◆ *A Combination Ranking Model for Research Paper Social Bookmarking Systems*, Pijitra Jomsri, Siripun Sanguansintukul, and Worasit Choochaiwattana
- ◆ *An Upgrading Feature-based Opinion Mining Model on Vietnamese Product Reviews*, Quang-Thuy Ha, Tien-Thanh Vu, Huyen-Trang Pham, and Cong-To
- ◆ *Predicting Mental Health Status based on Web Usage Behavior*, Tingshao Zhu, Ang Li, Yue Ning, and Zengda Guan

Conference Banquet (18:00 - 20:00)

Location: Grand Ballroom, The third floor

Friday, September 9, 2011

Keynote Talk (08:30 - 09:20)

Chair: Jiming Liu

Location: Yi Fu Science Hall main lecture hall

Title: People's Opinion, People's Nexus, People's Security and Computational Intelligence: the Evolution Continues.

Speaker: Ali Ghorbani (University of New Brunswick, Canada)

Keynote Talk (09:20 - 10:10)

Chair: Jiming Liu

Location: Yi Fu Science Hall main lecture hall

Title: Combinatorial Fusion Analysis in Brain Informatics: Gender variation in facial attractiveness judgment

Speaker: D. Frank Hsu (Fordham University, USA)

Coffee Break (10:10 - 10:30)

AT Session – A2 (10:30 - 12:00)

Active Human-Web Interaction and Social Media

◆ **Chair: Li Liu**

◆ **Location: Yifu Science Hall 201**

- ◆ *Visualizing Secure Hash Algorithm (SHA-1) on the Web*, Dalia B. Nasr, Hatem M. Bahig, Sameh S. Daoud
- ◆ *Emotion and Rationality in Web Information: An Eye-tracking Study*, Linchan Qin, Ning Zhong, Shengfu Lu, Mi Li, and Yangyang Song
A Dynamic Trust Network for Autonomy-Oriented Partner Finding, Hongjun Qiu, Jiming Liu, and Ning Zhong
- ◆ *Constructing the Internet Behavior Ontology: Projection from Psychological Phenomena with Qualitative and Quantitative Methods*, Qi Zhang, Zhuohong Zhu, Tingshao Zhu, Jiuling Xin, Shujuan Wang, Weichen Zhang, Ang Li, Yilin Li, Shan Tang, and Yuxi Pei
- ◆ *Why Do People Share News in Social Media?*, Chei Sian Lee, Long Ma, and Dion Hoe-Lian Goh

BI Session – B1 (part 2) (10:30 - 12:00)

Thinking and Perception-centric Investigations of Human Information Processing Systems

◆ **Chairs: Haiyan Zhou**

◆ **Location: Yifu Science Hall 202**

- ◆ *Knowledge Representation Meets Simulation to Investigate Memory Problems after Seizures*, Youwei Zheng and Lars Schwabe
- ◆ *An Event-Response Model Inspired by Emotional Behaviors*, Nirmal Kumar S, Sakthi Balan M, and Subrahmanya S V
- ◆ *Generating Decision Makers' Preferences, from their Goals, Constraints, Priorities and Emotions*, Majed Al-Shawa
- ◆ *Modeling and Analyzing Agents' Collective Options in Collaborative Decision Making*, Majed Al-Shawa
- ◆ *Effects of Reaction Time on Kinetic Visual Field*, Xiaoya Yu, Jinglong Wu, Shuhei Miyamoto, and Shengfu Lu

AMT Session – A3(part 2) (10:30 - 12:00)

◆ **Active Web Intelligence Applications**

◆ **Chairs: Yi Zeng**

◆ **Location: Yifu Science Hall 203**

- ◆ *User Interests Modeling Based on Multi-source Personal Information Fusion and Semantic Reasoning, Yunfei Ma, Yi Zeng, Xu Ren, and Ning Zhong*
- ◆ *Tags Weighting Based on User Profile , Saida Kichou, Hakima Mellah, Youssef Amghar, Fouad Dahak*
- ◆ *A Context-aware Recommender System for M-commerce Applications, Jiazao Lin, Xining Li, Yi Yang, Li Liu, Wenqiang Guo Xin Li, and Lian Li*
- ◆ *Towards Coequal Authorization for Dynamic Collaboration , Yuqing Sun and Chen Chen*

Conference Lunch (12:00 - 14:00)

Location:TBD

AMT'11/BI'11 Invited Talks

Title: The Global-first Topological Definition of Perceptual Objects, and Its Neural Correlation in Anterior Temporal Lobe

PROFESSOR Lin Chen (joint talk with Ke Zhou, Wenli Qian, and Qianli Meng)
Chinese Academy of Sciences, China



Abstract

What is a perceptual object? This question seems to be straightforward yet its answer has become one of the most central and also controversial issues in many areas of cognitive sciences. The “global-first” topological approach ties a formal definition of perceptual objects to invariance over topological transformation, and the core intuitive notion of a perceptual object - the holistic identity preserved over shape-changing transformations - may be precisely characterized as topological invariants, such as connectivity and holes. The topological definition of objects has been verified by a fairly large set of behavioral experiments, including, for example, MOT and attention blink, which consistently demonstrated that while object identity can survive various non-topological changes, the topological change disturbs its object continuity, being perceived as an emergence of a new object. Companion fMRI experiments revealed the involvement of anterior temporal lobe, a late destination of the visual form pathway, in the topological perception and the formation of perceptual objects defined by topology. This contrast of global-first in behavior and late destination in neuroanatomy raises far-reaching issues regarding the formation of object representations in particular, and the fundamental question of “where to begin” in general.

Biography

Lin Chen is director and professor of State Key Laboratory of Brain and Cognitive Science, Institute of Biophysics, Chinese Academy of Sciences, and director of Beijing MRI Center for Brain Research. Professor Chen is the member of Chinese Academy of Sciences since 2003, and the member of the Academy of Sciences for the Developing World (TWAS) since 2009. His research interests include experimental psychology, cognitive science, visual cognition, and human brain mapping. In 1980-83, Professor Chen was a visiting scholar and Sloan Foundation postdoctoral fellow at University of California, San Diego, and at Irvine; He was professor of University of Science and Technology of China in 1985-2000, and professor and director in Beijing Laboratory of Cognitive Science, Chinese Academy of Sciences (Graduate School, Chinese Academy of Sciences) in 1986-2008. He was a guest professor at University of Regensburg and University of Munich in 2002-2004, and an adjunct investigator of National Institute of Mental Health, US. Professor Chen was awarded the Outstanding Scientist Prize by Qishu Science & Technology Foundation in 2004. Professor Chen has published many international journal articles and conference papers, including:

Zhou, K., Huan, L., Zhou T.G, Zhuo Y., and Chen, L. (2010). Topological change disturbs object continuity in attentive tracking. *PNAS*, 107(50), 21920-21924.

Wang, B., Zhou, T.G., Zhuo, Y., and Chen, L. (2007). Global topological dominance in the left hemisphere. *PNAS*, 104, 21014-21019.

Chen, L. (2005). The topological approach to perceptual organization (invited lead paper). *Visual Cognition*, 12, 553-637.

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Title: Combinatorial Fusion Analysis in Brain Informatics: Gender Variation in Facial Attractiveness Judgment

PROFESSOR D. Frank Hsu (joint talk with Takehito Ito, Christina Schweikert, Tetsuya Matsuda, and Shinsuke Shimojo)
Fordham University, USA



Abstract

Information processing in the brain or other decision making systems, such as in multimedia, involves fusion of information from multiple sensors, sources, and systems at the data, feature or decision level. Combinatorial Fusion Analysis (CFA), a recently developed information fusion paradigm, uses combinatorial method to model the decision space and the rank-score characteristic (RSC) function to measure cognitive diversity. In this talk, we will first introduce CFA and its practice in a variety of application domains such as computer vision & target tracking, information retrieval & internet search, and virtual screening & drug discovery. We then apply CFA to investigate gender variation in facial attractiveness judgment on three tasks: liking, beauty and proxy using RSC function. It is demonstrated that the RSC function is useful in the differentiation of gender variation and task judgment, and hence can be used to compliment the notion of correlation which is widely used in statistical decision making. In addition, it is shown that CFA is a viable approach to deal with various issues and problems in brain informatics.

Biography

D. Frank Hsu is the Clavius Distinguished Professor of Science and professor of computer and information science at Fordham University in New York city. He has been visiting professor /scholar at University of Parid-Sud (and CNRS), Taiwan University, Tsing Hua University (Hsin-chu, Taiwan), Keio University, JAIST, Boston University and MIT. Hsu's research interests include combinatorics and graph theory, network interconnection and communications, and computing, informatics and analytics. An information fusion method he and his colleagues proposed and developed, Combinatorial Fusion Analysis, has been applied to target tracking, internet search, virtual screening, bioinformatics and brain informatics. Hsu has served on several editorial boards including Journal of Interconnection Networks, Pattern Recognition Letter, IEEE Transactions on Computers, Networks, International Journal of Foundation of Computer Science, and Journal of Ubiquitous Computing and Intelligence. Hsu is a Fellow of the New York Academy of Sciences, the Institute of Combinatorics and Applications, and International Society of Intelligent Biological Medicine. He is currently Vice Chair of the New York Chapter of the IEEE Computational Intelligence Society.

Title: People's Opinion, People's Nexus, People's Security and Computational Intelligence: the Evolution Continues

PROFESSOR Ali Ghorbani
University of New Brunswick, Canada



Abstract

The talk begins with a brief introduction to some of our research work in the past few years as well as the ongoing research. A new model on extending the flexibility and responsiveness of websites through automated learning for custom-tailoring and adaptive web to user usage patterns, interests, goals, knowledge and preferences will be presented. The second part of the talk will be devoted to the challenges that the Computational Intelligence communities are faced with in order to address issues related to people's nexus, opinion, and security on the Web, and our contributions to these topics. At the end, I will provide an overview of our current research focus on network security and intelligence information handling and dissemination.

Biography

Dr. Ali Ghorbani has held a variety of positions in academia for the past 30 years including heading up projects and research groups and as department chair, director of computing services, and as assistant dean. Currently, Dr. Ghorbani serves as Dean of the Faculty of Computer Science, University of New Brunswick. He received the university's \$B!G\$ (Bs merit award for outstanding contributions to the University of New Brunswick in 2003 and UNB Research Scholar award for 2007-08. His current research focus is Web Intelligence, Network & Information Security, Complex Adaptive Systems, and Critical Infrastructure Protection. He authored more than 240 reports, book chapters, research papers in journals and conference proceedings and has edited 8 volumes. He is the co-inventor of 3 patents in the area of Web Intelligence and Network Security. He served as General Chair and Program Chair/co-Chair for 10 International Conferences, and organized over 10 International Workshops. He has also supervised more than 120 research associates, postdoctoral fellows, and graduate students. Dr. Ghorbani is the founding Director of Information Security Centre of Excellence at UNB. He is also the coordinator of the Privacy, Security and Trust (PST) network. Dr. Ghorbani is the co-Editor-In-Chief of Computational Intelligence, an international journal, and associate editor of the International Journal of Information Technology and Web Engineering and the ISC journal of Information Security. His book, Intrusion Detection and Prevention Systems: Concepts and Techniques published in 2009. Dr. Ghorbani is the member of ACM, IEEE, and Canadian Information Processing Society (CIPS). He is a member of CIPS Professional Standards Advisory Council (PSAC) and the Natural Sciences and Engineering Research Council of Canada committee on Safety and Security.

Title: Towards Conversational Artifacts

PROFESSOR Toyoaki Nishida
Kyoto University, Japan



Abstract

Conversation is a natural and powerful means of communication for people to collaboratively create and share information and knowledge. People are very fluent both in aligning their behavior and in coordinating multiple modalities to create meaning. A big challenge is to build socialized conversational artifacts that can participate in conversation to share information, knowledge, emotion and intention in a reliable and efficient fashion. In this talk, I present an approach to socialized conversational artifacts. The key technology is a tight coupling of conversation measurement and robot behavior synthesis so that the artifacts can learn from experiences how to interact with other social agents to achieve the shared goals. I discuss the potential and challenges of this approach, as well as some philosophical issues underlying it.

Biography

Toyoaki Nishida is Professor at Department of Intelligence Science and Technology, Graduate School of Informatics, Kyoto University. He received the B.E., the M.E., and the Doctor of Engineering degrees from Kyoto University in 1977, 1979, and 1984, respectively. His research centers on artificial intelligence and human computer interaction. He founded an international workshop series on social intelligence design in 2001. Major works in social intelligence design have been published in several special issues of the *AI & Society* journal. He opened up a new field of research called conversational informatics in 2003. He collected and compiled representative works in conversational informatics as: Nishida (ed.) *Conversational Informatics -- An Engineering Approach*, Wiley, 2007. Currently, he leads several projects related to social intelligence design and conversational informatics. He serves for numerous academic activities, including the president of JSAI (Japanese Society for Artificial Intelligence), an associate editor of the *AI & Society* journal, an area editor (Intelligent Systems) of the *New Generation Computing* journal, a technical committee member of Web Intelligence Consortium, and an associate member of the Science Council of Japan.

Title: Study of System Intuition by Noetic Science Founded by QIAN Xuesen

PROFESSOR Zhongtuo Wang
Dalian University of Technology, China



Abstract

This talk investigates the meaning, contents and characteristics of systems institution on the basis of Noetic Science, which was founded by Qian Xuesen. The systems intuition is the human capability to find the hidden system imagery of the object or to create an imagery of new system. The basic noetic foundation of system intuition and cultural influence to it are studied. The open problems are also listed.

Biography

Professor Zhongtuo Wang is affiliated with School of Management, Dalian University of Technology (DUT). He is the director of Research Center of Knowledge Science and Technology in DUT. Professor Wang is the member of Chinese Academy of Engineering. In 1950s Professor Wang joined Department of Electrical Engineering, DUT. As the founder of Department of Control Engineering of DUT, he made a lot of contributions to the teaching and research in the field of optimal control and computer applications. In the year of 1977, he transferred to the area of systems engineering. He was one of the pioneers in systems engineering in China (e.g. research and practice, PhD program, etc.) and had served as vice-president of Systems Engineering Society of China. He is the founder of Institute of Systems Engineering - DUT and devoted himself to research on decision analysis, complex adaptive system and network optimization. He acted as the principal investigator for a lot of practical projects on systems engineering practice, including the strategic analysis of regional economic development, production planning of petroleum refinery, planning and scheduling of the construction projects, and impact study of information technology to the management transformation. Besides, Professor Wang developed graduate programs on systems engineering and later on management science for DUT. During 1986-1988, Professor Wang have been worked in the International Institute for Applied Systems Analysis (IIASA) in Vienna, Austria. He served as the coordinator of an international collaborative project and designed the 1st Decision Support System for Regional Development and Planning of China, well-known internationally for his outstanding contributions. Professor Wang has published 14 books, 9 translations and more than 140 papers and reports. He had received 2 national awards, 9 awards from ministries of Chinese government. Professor Wang is now engaged in research on knowledge management and technological innovation.

Title: Study of Problem Solving Following Herbert Simon

PROFESSOR Yulin Qin (joint talk with Ning Zhong)
International WIC Institute/BJUT, and Department of Psychology/CMU



Abstract

Herbert Simon (1916.6.15 - 2001.2.9) was one of the greatest pioneers in cognitive science and artificial intelligence, as well as in behavior economics and many other fields. Problem solving was his core work in artificial intelligence and cognitive psychology. He and Newell first postulated a general and systematic framework of human (and machine) problem solving as iteratively applying operators to transform the state of the problem from the starting state in problem state space to eventually achieve the goal state. Heuristic problem solving includes two basic components: heuristic searching (such as means-ends analysis) and heuristic rules (used to change the problem states). And then, he extended this framework in two dimensions. One is applying this framework to creative learning and scientific discovery (both were thought as specific ill-structured problem solving tasks); the other is to elaborate this general framework with more detailed models in memory (such as chunk structure in short term memory) and the knowledge (and problem) representations, including the knowledge structure difference between experts and novices, diagrammatic representation and mental imagery. To meet the challenge of Web intelligence and to pioneer the effective and efficient ways of information processing at Web scale, as the first step, we would learn this process from human brain, one of the greatest webs, based on Simon and Newell's framework in problem solving. We have found that, even in the basic application of heuristic rules, the processes are distributed in several major parts of brain and with certain areas for the communications across these networks. We have checked the brain activations in regard to working memory and mental imagery in problem solving. We have also found the evidences supporting the hypothesis that the scientific discovery is a specific problem solving from neural activations that central brain areas activated in scientific discovery overlapping with the areas in general problem solving tasks. These findings offer strong clues for how to solve problems at Web scale.

Biography

Yulin Qin is a distinguished professor in the International WIC Institute, Beijing University of Technology, and a senior research psychologist in the department of psychology, Carnegie Mellon University. Professor Qin received M.E (1982) in computer science and engineering at Beijing University of Aeronautics and Astronautics, and Ph.D. (1992) in cognitive psychology at Carnegie Mellon University with Herbert Simon as advisor. His research interests include cognitive psychology, cognitive neuroscience and Web Intelligence, and currently focus on the neural basis of ACT-R, a computational cognitive architecture, and its various industrial applications, including in Web Intelligence.

Special Tech Talk

Title: Humanoid robotics for Services

Qingyi LELAY
ALDEBARAN Robotics, Paris, France
(ykun@aldebaran-robotics.com)

ABSTRACT

Robotics will take an important place in people's daily life of 21st century: robots will become unavoidable devices for assisting people at home, at work and for leisure. A humanoid shape robot has the advantages to adapt into domestic environment and to become personal assistant. Nao, designed and manufacture by ALDEBARAN Robotics, has now been used in the fields of autism treatment, personal care and smart houses for services.

1. INTRODUCTION

Robotics has started to be involved in people's life as the manipulator, industrial robot and entertainment robot. The ultimate goal of the robotics research is to facilitate human's life and to accomplish impossible tasks under certain conditions. Human shaped robot is a member in the robotics family. The research and the application of this kind of robot is carried out all over the world. ALDEBARAN Robotics, a French pioneer in this field, shares their research and development experience.

2. NAO, HUMANOID ROBOT

Since 2005, Aldebaran Robotics, considering that the technology is now available to provide affordable robots, develops humanoid robots that should become a companion for everyone. Since the very beginning, Aldebaran has chosen the humanoid shape for its robot Nao.



This choice brings several constraints (bipedal locomotion, design, limited embedded hardware, software and sensors) but is probably the best solution for an efficient integration of the robot in domestic environment. Our homes are designed for humans, with legs, arms and hands, the humanoid robot will be able to take advantage of its similarity of its embodiment. The other major advantage of the humanoid shape is its efficiency for the man-robot interaction. As it is admitted by psychologists, the communication is carried by the body language as well as the voice. The humanoid robot can express its understanding of a situation by its posture and its gestures as efficiently as by voice and words. By using human-like behaviors, the humanoid robot could be predictable in its reactions and that makes the robot more acceptable for everyday life cohabitation.

3. HUMANOID ROBOT APPLICATIONS

If Nao is used today mainly as a research platform and as a support for education, the first service applications are envisaged. Aldebaran will focus its development of applications on two domains where the small humanoid robot can be rapidly appreciated: communication with autistic children and companionship for elderly people.

Autism spectrum disorders (ASD) is a disorder of neural development characterized by impaired social interaction and communication, and by restricted and repetitive behavior. Nao is used to help researchers determine if the aid of a sophisticated robot can enhance the therapy experience for children with autism by bridging the gulf between the world of human social interaction that so often leaves them perplexed, anxious



and frustrated and the world of science and technology that they prefer. The experiences showed that children that cannot communicate with other people can be interested by interacting with this human-like interactive object.

In University of Notre Dame, the therapy sessions Involving children with autism, the team focuses on isolating individual behaviors and teaching communication behavior on a behavior-by-behavior basis. The use of Nao, a robot programmed

to simplify communication gestures and facial expressions, aids in teaching children on the autism spectrum to utilize and understand these communication behaviors.

Autonomy of elderly people is a major issue for our aging societies. The robot should be an acceptable solution to assist people losing their autonomy. The robot can check the activity of the person, remind important events of the day (medicine, appointment...) and provide a unified interface to communication systems and smart environment. ROMEO is a project in European Union for a 1,4 meter human-sized robot under research in ALDEBARAN Robotics. The ROMEO's objective is to develop a human sized robot that can act as a comprehensive assistant for persons suffering from loss of autonomy. The development of humanoid robot for services needs the international collaboration and to make the robots available to the public is the goal of each robotic researcher.

BI'11 Workshop

Workshop on Meta-Synthesis and Complex Systems

- Evaluation and Recommendation Methods Based on Graph Model
Yongli Li (Beijing Institute of Information and Control, China)
- An Improved EDP Algorithm to Privacy Protection in Data Mining
Ming-Zheng (Dalian University of Technology, China)
- A Hybrid Multiple Attributes Two-sided Matching Decision Making Method with Incomplete Weight Information
Zhen Zhang, Chonghui Guo (Dalian University of Technology, China)
- A New Linguistic Aggregation Operator and its Application
Cuiping Wei (Qufu Normal University, China)
- Group Polarization and Non-positive Social Influence : A Revised Voter Model Study
Zhenpeng LI, Xijin Tang (Academy of Mathematics & Systems Science, Chinese Academy of Sciences, China)
- On-demand Dynamic Recommendation Mechanism in Support of Enhancing Idea Creativity for Group Argumentation
Xi Xia, Xiaoji Zhou (China Aerospace Engineering Consultation Center, China)
- Utilizing Knowledge Based Mechanisms in Automated Feature Recognition Processes
Hao Lan Zhang (Zhejiang University, China), Christian Van der Velden (BAE Systems, Australia)
- The Order Measure Model of Knowledge Structure
Qiu Jiangnan(Dalian University of Technology, China)

AMT'11 Special Session

Special Session on Technology Intelligence

- Smart Searching System for Virtual Science Brain
Hong-woo Chun, Chang-hoo Jeong, Sa-kwang Song, Yunsoo Choi, Doheon Jeong, Sung-pil Choi, and Won-Kyung Sung
- Using Semantic Web Technologies for Technology Intelligence Services
Seungwoo Lee, Mikiyoung Lee, Hanmin Jung, Pyung Kim, Dongmin Seo, Tae Hong Kim, Jinhee Lee, and Won-Kyung Sung
- Procedural Knowledge Extraction on MEDLINE Abstracts
Sa-kwang Song, Heung-seon Oh, Sung Hyon Myaeng, Sung-pil Choi, Hong-woo Chun, Yunsoo Choi, and Chang-hoo Jeong

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