Final Program

2010 International Conference on Active Media Technology
2010 International Conference on Brain Informatics

Co-organized by:
Web Intelligence Consortium (WIC)
IEEE Task Force on Brain Informatics (IEEE TF-BI)

York University, Toronto, Canada

http://www.wici-lab.org/amtbi10/
Conference Sponsors

Co-organized by

Web Intelligence Consortium (WIC)  
IEEE Computational Intelligence Society

Co-sponsored by

Springer Lecture Notes in Computer Science  
York University, Toronto Canada  
University of Regina Canada
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Message from the Conference and Program Chairs

We are pleased to give you a warm welcome to the 2010 International Joint Conference on Active Media Technology and Brain Informatics (AMT 2010 and BI 2010). On behalf of the AMT 2010 and BI 2010 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 2010 and BI 2010 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 2010 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, and AMT 2006 in Brisbane, Australia, 2009 In Beijing, China). All these have once again confirmed our vision back in 2001 to capture and document the evolution unfolding in our digital era. AMT 2010 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 unfailing support. AMT 2010 and BI 2010 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 2010 and BI 2010, of our keynote speakers, Ben Shneiderman from University of Maryland, Vinod Goel from York University, Yingxu Wang from University of Calgary, Jianhua Ma from Hosei University. AMT 2010 and BI 2010 could not have taken
place without the great team effort of the Local Organizing Committee and the support of the International WIC Institute, and York University.

Our special thanks go to Tetsuya Yoshida and Yue Xu for organizing a special session on text analysis and utilization, and to Hanmin Jung, Li Chen and Sung-Pil Choi for organizing a special session on technology intelligence. We are grateful to the chairs and members of the organizing committee for their significant contribution to the organization of the conference. In particular, we would like to acknowledge the generous help received from Ning Zhong, Jimmy Huang, Vivian Hu, Jessie Zhao, Jun Miao, Ellis Lau and Heather Bai. Our appreciation also goes to Juzhen Dong for her excellent technical support of the AMT 2010 conference management system and its web sites. Last but not the least, we thank Alfred Hofmann and Anna Kramer of Springer for their help in coordinating the publication of this special volume in an emerging and interdisciplinary research area. We appreciate the support and sponsorship from York University and the University of Regina.

Sheila Petty and Runhe Huang
AMT 2010 Conference General Chairs

Aijun An and Pawan Lingras
AMT 2010 Program Chairs

Tomaso Poggio and Jiming Liu
BI 2010 Conference General Chairs

Yiyu Yao and Ron Sun
BI 2010 Program Chairs
### AMT’10/BI’10 Program AT A GLANCE

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Session Title</th>
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<td><strong>Saturday</strong></td>
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<tr>
<td>August 28, 2010</td>
<td>09:10-9:30</td>
<td>Conference Opening [TEL 0001]</td>
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<td>10:30-10:50</td>
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<td>10:50-11:50</td>
<td>Keynote Talk [TEL 0001] Chair: Pawan Lingras</td>
<td>Fractionating the Rational Brain, Vinod Goel</td>
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<td>11:50 - 13:20</td>
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<td>Brain Data Analysis and Data Brain I</td>
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<td>AMT Session - A1 [TEL 0006]</td>
<td>Special session on Text Analysis and Utilization (TAU)</td>
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<td>Brain Data Analysis and Data Brain II</td>
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<td>AMT Session - A3 [TEL 0006]</td>
<td>Entertainment and Social Applications of Active Media</td>
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<td>Neuronal Modeling and Brain Modeling</td>
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<td>AMT Session - A5 [TEL 0006]</td>
<td>Special session on Technology Intelligence</td>
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<td>August 29, 2010</td>
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<td>Keynote Talk [TEL 0001] Chair: Jiming Liu</td>
<td>Cognitive Informatics and Denotational Mathematical Means for Brain Informatics, Yingxu Wang</td>
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<td>Active Smart u-Things and Cyber Individuals, Jianhua Ma</td>
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<td>Semantic Computing for Active Media and AMT Based Systems</td>
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<td>11:00</td>
<td>AMT Session - A11 [TEL 0007]</td>
<td>Web Mining, Wisdom Web and Web Intelligence</td>
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<td>AMT Session - A12 [TEL 0007]</td>
<td>Machine Learning and Human-Centered Robotics</td>
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AMT'10/BI'10 Program

Saturday, August 28, 2010

On-site Registration
Time: August 28-29, 08:15-18:00
Location: Lobby

Conference Opening (09:10-09:30)
Location: TEL 0001
Welcome:
Program Introduction:

Keynote Talk (August 28, 09:30 - 10:30)
Chair: Aijun An
Location: TEL 0001
Title: Technology-Mediated Social Participation: Deep Science and Extreme Technology
Speaker: Ben Shneiderman

Coffee break (10:30 - 10:50)

Keynote Talk (August 28, 10:50 - 11:50)
Chair: Pawan Lingras
Location: TEL 0001
Title: Fractionating the Rational Brain
Speaker: Vinod Goel

Lunch (11:50 - 13:20)

BI Session - B1 (August 28, 13:20 - 14:50)
Brain Data Analysis and Data Brain I
Chair:
Location: TEL 0005
♦ The Effect of the Normalization Strategy on Voxel-Based Analysis of DTI Images: A Pattern Recognition Based Assessment, Gloria Diaz, Gonzalo Pajares, Eduardo Romero, Juan Alvarez-Linera, Eva Lopez, Juan Antonio Hernandez-Tamames and Norberto Malpica (B240)
♦ Single Trial Classification of EEG and Peripheral Physiological Signals for Recognition of Emotions Induced by Music Videos, Sander Koelstra, Ashkan Yazdani, Mohammad Soleymani, Christian Muhl, Jong-Seok Lee, Anton Nijholt, Thierry Pun, Touradj Ebrahimi and Ioannis Patras (B227)
♦ Brain Signal Recognition and Conversion Towards Symbiosis with Ambulatory Humanoids, Yasuo Matsuyama, Keita Noguchi, Takashi Hatakeyama, Nimiko Ochiai and Tatsuro Hori (B207)
♦ Recurrence Plots for Identifying Memory Components in Single-trial EEGs, Nasibeh Talebi and Ali Motie Nasrahadi (B213)

AMT Session - A1 (August 28, 13:20 - 14:50)
Special session on Text Analysis and Utilization (TAU)
Chairs: Tetsuya Yoshida
Location: TEL 0006
♦ Performance Evaluation of Constraints in Graph-based Semi-Supervised Clustering, Tetsuya Yoshida
♦ Recommendation of Little Known Good Travel Destinations using Word-of-mouth Information on the Web, Kuzou Ohara, Yu Fujimoto, and Tomofumi Shinya
♦ Exploring Social Annotation Tags to Enhance Information Retrieval Performance, Zheng Ye, Xiangji Jimmy Huang, Song Jin, and Hongfei Lin
AMT Session - A2 (August 28, 13:20 - 14:50)
Data Mining, Ontology Mining and Web Reasoning
Chair:
Location: TEL 0007
♦ Multiagent based Large Data Clustering Scheme for Data Mining Applications, T. Ravindra Babu, M. Narasimha Murty and S.V. Subrahmanya
♦ Fractal Based Video Shot Cut/Fade Detection and Classification, Zeinab Zeinalpour-Tabrizi, Amir Farid Aminian-Modarres, Mahmood Fathy, and Mohammad Reza Jahed-Motlagh
♦ A Semantic Web Services Discovery Algorithm Based on QoS Ontology, Baocai Yin, Huirong Yang, Pengbin Fu, and Xiaobo Chen

Short break (14:50 - 15:00)

BI Session - B2 (August 28, 15:00 - 16:30)
Brain Data Analysis and Data Brain II
Chair:
Location: TEL 0005
♦ Feature Rating by Random Subspaces for Functional Brain Mapping, Diego Sona and Paolo Avesani (B235)
♦ Improving Individual Identification in Security Check with an EEG based Biometric Solution, Qinlin Zhao, Hong Peng, Bin Hu, Quanying Liu, Li Liu, Yanbing Qi and Lanlan Li (B219)
♦ A Study of Mozart Effect on Arousal, Mood, and Attentional Blink, Chen Xie, Lun Zhao, Duoqian Miao, Deng Wang, Zhihua Wei and Hongyun Zhang (B228)

AMT Session - A3 (August 28, 15:00 - 16:30)
Entertainment and Social Applications of Active Media
Chair:
Location: TEL 0006
♦ The Influence of Ubiquity on Screen-Based Interfaces, Sheila Petty and Luigi Benedicenti
♦ Perception of Parameter Variations in Linear Fractal Images, Daryl H. Hepting and Leila Latifi
♦ Music Information Retrieval with Temporal Features and Timbre, Angelina A. Tzacheva and Keith J. Bell
♦ Assessing End-user Programming for a Graphics Development Environment, Lizao Fang and Daryl H. Hepting
♦ Visual Image Browsing and Exploration (Vibe): User Evaluations of Image Search Tasks, Grant Strong, Orland Hoeber, and Minglun Gong

AMT Session - A4 (August 28, 15:00 - 16:30)
AMT for Semantic Web and Web 2.0
Chair:
Location: TEL 0006
♦ A Spatio-temporal Framework for Related Topic Search in Micro-blogging, Shuangyong Song, Qiudan Li, and Nan Zheng
♦ Exploiting Semantic Hierarchies for Flickr Group, Dongyuan Lu and Qiudan Li
♦ Understanding a Celebrity with His Salient Events, Shuangyong Song, Qiudan Li, and Nan Zheng
♦ User Interests: Denition, Vocabulary, and Utilization in Unifying Search and Reasoning, Yi Zeng, Yan Wang, Zhisheng Huang, Danica Damljanovic, Ning Zhong, Cong Wang

Coffee break (16:30 - 16:50)
BI Session - B3 (August 28, 16:50 - 18:20)
Neuronal Modeling and Brain Modeling
Chair: TEL 0005
Location: TEL 0005
♦ Segmentation of 3D Brain Structures Using the Bayesian Generalized Fast Marching Method, Mohamed Baghdadi, Nacera Benamrane and Lakhdar Sais (B239)
♦ Domain-Specific Modeling as a Pragmatic Approach to Neuronal Model Descriptions, Ralf Ansorg and Lars Schwabe (B211)
♦ Guessing What’s on Your Mind: Using the N400 in Brain Computer Interfaces, Marijn van Vliet, Christian Muhl, Boris Reuderink and Mannes Poel (B215)
♦ A Brain Data Integration Model Based on Multiple Ontology and Semantic Similarity, Li Xue, Yun Xiong and Yangyong Zhu (B214)

AMT Session - A5 (August 28, 16:50 - 18:20)
Special session on Technology Intelligence
Chair: Hanmin Jung
Location: TEL 0007
♦ Extracting Concerns and Reports on Crimes in Blogs, Yusuke Abe, Takehito Utsuro, Yasuhide Kawada, Tomohiro Fukuhara, Noriko Kando, Masaharu Yoshioka, Hiroshi Nakagawa, Yoji Kiyota, and Masatoshi Tsuchiya
♦ Ontology Matching Method for Efficient Metadata Integration, Pyung Kim, Dongmin Seo, Mikyoung Lee, Seungwoo Lee, Hanmin Jung, and Won-Kyung Sung
♦ Extracting protein sub-cellular localizations from literature, Hong-Woo Chun, Jin-Dong Kim, Yun-Soo Choi, and Won-Kyung Sung
♦ Natural Language Query Processing for Life Science Knowledge, Jin-Dong Kim, Yasunori Yamamoto, Atsuko Yamaguchi, Mitsuteru Nakao, Kenta Oouchida, Hong-Woo Chun, and Toshihisa Takagi

AMT Session - A6 (August 28, 16:50 - 18:20)
Web Based Social Networks
♦ Contextual Recommendation of Social Updates, a Tag-based Framework, Adrien Joly, Pierre Maret, and Johann Daigremont
♦ Semantic Web Portal: A Platform for Better Browsing and Visualizing Semantic Data, Ying Ding, Yuyin Sun, Bin Chen, Katy Borner, Li Ding, David Wild, Melanie Wu, Dominic DiFranzo, Alvaro Graves Fuenzalida, Daifeng Li, Stasa Milojevic, ShanShan Chen, Madhuvanthi Sankaranarayanan, Ioan Toma
♦ NicoScene: Video Scene Search by Keywords based on Social Annotation, Tahara Tahara, Atsushi Tago, Hiroyuki Nakagawa, and Akihiko Ohsuga
♦ Social Relation Based Search Refinement: Let Your Friends Help You!, Xu Ren, Yi Zeng, Yulin Qin, Ning Zhong, Zhisheng Huang, Yan Wang, Cong Wang

Conference Reception (19:00 - 21:00)
Sunday, August 29, 2010

**Keynote Talk (August 29, 09:30 - 10:30)**
Chair: Jiming Liu  
Location: TEL 0001  
Title: Cognitive Informatics and Denotational Mathematical Means for Brain Informatics  
Speaker: Yingxu Wang

Coffee break (10:30 - 10:50)

**Keynote Talk (August 28, 10:50 - 11:50)**
Chair: Sheila Petty  
Location: TEL 0001  
Title: Active Smart u-Things and Cyber Individuals  
Speaker: Jianhua Ma

Lunch (11:50 - 13:20)

**BI Session - B4 (August 29, 13:20 - 14:50)**  
**WICI Perspectives on Brain Informatics I**  
Chair: Ning Zhong  
Location: TEL 0005
- Interaction Between Visual Attention and Goal Control for Speeding up Human Heuristic Search, Rifeng Wang, Jie Xiang and Ning Zhong (B222)
- The Role of the Parahippocampal Cortex in Memory Encoding and Retrieval: An fMRI Study, Mi Li, Shengfu Lu, Jiaojiiao Li and Ning Zhong (B217)
- Brain Activation and Deactivation in Human Inductive Reasoning: An fMRI Study, Peipeng Liang, Yang Mei, Xiuqin Jia, Yanhui Yang, Shengfu Lu, Ning Zhong and Kuncheng Li (B248)
- Clustering of fMRI Data Using Affinity Propagation, Dazhong Liu, Wanxuan Lu, and Ning Zhong (B218)

**AMT Session - A7 (August 29, August 29, 13:20 - 14:50)**  
**Adaptive Web Systems and Information Retrieval**  
Chair: Yue Xu  
Location: TEL 0006
- Folksonomy-Based Ontological User Interest Profile Modeling and Its Application in Personalized Search, Xiaogang Han, Zhiqi Shen, Chunyan Miao, and Xudong Luo
- Visualizing Threaded Conversation Networks: Mining Message Boards and Email Lists for Actionable Insights, Derek L. Hansen, Ben Shneiderman, and Marc Smith
- A Hybrid Chinese Information Retrieval Model, Zhihan Li, Yue Xu, and Shlomo Geva
- Term Frequency Quantization for Compressing an Inverted Index, Lei Zheng and Ingemar J. Cox

**AMT Session - A8 (August 29, August 29, 13:20 - 14:50)**  
**Active Computer Systems and Intelligent Interfaces**  
Chair:  
Location: TEL 0007
- Interactive Visualization System for DES, Mohamed S. Asseisah, Hatem M. Bahig, and Sameh S. Daoud
- Intelligent Implicit Interface for Wearable Items Suggestion, Aasim Khan, Muhammad Aslam, and A. M. Martinez-Enriquez
- Enhanced Intra Coding of H.264/AVC Advanced Video Coding Standard with Adaptive Number of Modes, Mohammed Golam Sarwer and Q. M. Jonathan Wu

Coffee break (14:50 - 15:10)
BI Session - B5 (August 29, 15:10 - 16:40)

WICI Perspectives on Brain Informatics II
Chair: Ning Zhong  
Location: TEL 0005

- Towards Systematic Human Brain Data Management Using a Data-Brain Based GLS-BI System, Jianhui Chen, Ning Zhong and Runhe Huang (B230)
- The Role of Posterior Parietal Cortex in Problem Representation, Jie Xiang, Yulin Qin, Junjie Chen, Haiyan Zhou, Kuncheng Li and Ning Zhong (B238)
- Basic Level Advantage and Its Switching during Information Retrieval: An fMRI Study, Haiyan Zhou, Jieyu Liu, Wei Jing, Yulin Qin, Shengfu Lu, Yiyu Yao and Ning Zhong (B256)

AMT Session - A9 (August 29, 15:10 - 16:40)

Evaluation of Active Media and AMT Based Systems
Chair:  
Location: TEL 0006

- Investigating Perceptions of a Location-Based Annotation System, Huynh Nhu Hop Quach, Khasfariyati Razikin, Dion Hoe-Lian Goh, Thi Nhu Quynh Kim, Tan Phat Pham, Yin-Leng Theng, Ee-Peng Lim, Chew Hung Chang, Kalyani Chatterjea, and Aixin Sun
- Apollon13: A Training System for Emergency Situations in a Piano Performance, Yuki Yokoyama and Kazushi Nishimoto
- Modeling User Knowledge from Queries: Introducing a Metric for Knowledge, Frans van der Sluis and Egon L. van den Broek

AMT Session - A10 (August 29, 15:10 - 16:40) (Note: There are two short sessions in this time slot)

Multi-Agent Systems
Chair:  
Location: TEL 0007

- Building Users Profiles from Clustering Resources in Collaborative Tagging Systems, Maya Rupert and Salima Hassas
- Some Optimizations in Maximal Clique based Distributed Coalition Formation for Collaborative Multi-Agent Systems, Predrag T. Totic and Naveen K. R. Ginne  
  Continued in the same room

Semantic Computing for Active Media and AMT Based Systems
Chair:  
Location: TEL 0007

- Enhancing Content-Based Image Retrieval Using Machine Learning Techniques, Qinmin Vivian Hu, Zheng Ye, and Xiangji Jimmy Huang
- Computer-Assisted Interviewing with Active Questionnaires, Seon-Ah Jang, Jae-Gun Yang, and Jae-Hak J. Bae

Conference Banquet (18:00 - 21:00)  
Location:
Monday, August 30, 2010

BI Session - B6 (August 30, 09:00 - 11:00)
Cognition-inspired Applications
Chair:
Location: TEL 0005
♦ Modelling Caregiving Interactions During Stress, Azizi Ab Aziz, Jan Treur, and C. Natalie van der Wal (B254)
♦ A Time Series Based Method for Analyzing and Predicting Personalized Medical Data, Vivian Hu, Jimmy Huang, William Melek and C. Joseph Kurian (B251)
♦ Language Analytics for Assessing Brain Health: Cognitive Impairment, Depression and Pre-Symptomatic Alzheimer’s Disease, William L. Jarrold, Bart Peintner, Eric Yeh, Ruth Krasnow, Harold S. Javitz and Gary D. Swan (B246)
♦ Data Fusion and Feature Selection for Alzheimer's Diagnosis, Blake Lemoine, Sara Rayburn and Ryan Benton (B242)
♦ A Cognitive Architecture Based on Neuroscience for the Control of Virtual 3D Human Creatures, Felipe Rodriguez, Francisco Galvan, Felix Ramos, Erick Castellanos, Gregorio Garcia and Pablo Covarrubias (B237)

BI Session - B7 (August 30, 09:00 - 11:00)
Cognitive Computing and Learning
Chair:
Location: TEL 0005
♦ An Adaptive Model for Dynamics of Desiring and Feeling based on Hebbian Learning, Tibor Bosse, Mark Hoogendoorn, Zulfiqar A. Memon, Jan Treur and Muhammad Umair (B216)
♦ Rank-Score Characteristics (RSC) Function and Cognitive Diversity, D. Frank Hsu, Bruce S. Kristal and Christina Schweikert (B247)
♦ Cognitive Effort for Multi-agent Systems, Luca Longo and Stephen Barrett (B205)
♦ Concept Learning in Text Comprehension, Manas Hardas and Javed Khan (B221)
♦ Comparing EEG/ERP-like and fMRI-like Techniques for Reading Machine Thoughts, Fabio Massimo Zanzotto and Danilo Croce (B209)

AMT Session - A11 (August 30, 09:00 - 11:00)
Web Mining, Wisdom Web and Web Intelligence
Chair:
Location: TEL 0007
♦ An Empirical Approach for Opinion Detection using Significant Sentences, Anil Kumar K.M and Suresha
♦ Automatically Extracting Web Data Records, Dheerendranath Mundluru, Vijay V. Raghavan, and Zonghuan Wu
♦ Web User Browse Behavior Characteristic Analysis Based on a BC Tree, Dingrong Yuan and Shichao Zhang
♦ Clustering Web Users Based on Browsing Behavior, Tingshao Zhu
♦ Privacy Preserving in Personalized Mobile Marketing, Yuqing Sun and Guangjiun Ji

Coffee break (11:00 - 11:20)
BI Session - B8 (August 30, 11:20 - 13:20)
Cognition-inspired Applications II
Chair:
Location: TEL 0006
- Computational Modeling and Analysis of Therapeutical Interventions for Depression, Fiemke Both, Mark Hoogendoorn, Michel C.A. Klein and Jan Treur (B232)
- The Effect of Sequence Complexity on the Construction of Protein-Protein Interaction Networks, Mehdi Kargar and Aijun An (B252)
- Investigation on Human Characteristics of Japanese Katakana Recognition by Active Touch, Suguru Yokotani, Jiajia Yang and Jinglong Wu (B249)
- Modelling the Emergence of Group Decisions Based on Mirroring and Somatic Marking, (B231)

BI Session - B9 (August 30, 11:20 - 13:20)
Cognitive Modeling and Information Processing
Chair:
Location: TEL 0006
- Behavioural Abstraction of Agent Models Addressing Mutual Interaction of Cognitive and Affective Processes, Alexei Sharpaniskykh and Jan Treur (B250)
- How Does Repetition of Signals Increase Precision of Numerical Judgment? Eike Benjamin Kroll, Jorg Rieger and Bodo Vogt (B224)
- Sparse Regression Models of Pain Perception, Irina Rish, Guillermo A. Cecchi, Marwan N. Baliki and A. Vania Apkarian (B220)
- A Qualitative Approach of Learning in Parkinson's Disease, Delphine Penny-Leguy and Josiane Caron-Pargue (B233)

AMT Session - A12 (August 30, 11:20 - 13:20)
Machine Learning and Human-Centered Robotics
Chair:
Location: TEL 0007
- K-Means Clustering as a Speciation Mechanism within an Individual-Based Evolving Predator-Prey Ecosystem Simulation, Adam Aspinall and Robin Gras
- Robust and Efficient Change Detection Algorithm, Fei Yu, Michael Chukwu, and Q. M. Jonathan Wu
AMT'10/BI'10 Invited Talks

Title: Technology-Mediated Social Participation: Deep Science and Extreme Technology

PROFESSOR BEN SHNEIDERMAN
University of Maryland, USA
http://www.cs.umd.edu/hcil/

Abstract
The dramatic success of social media such as Facebook, Twitter, YouTube, Flickr, blogs, and traditional discussion groups empowers individuals to become active in local and global communities. With modest redesign, these technologies can be harnessed to support national priorities such as healthcare/wellness, disaster response, community safety, energy sustainability, etc. This talk describes a research agenda for these topics that develops deep science questions and extreme technology challenges.

Biography
BEN SHNEIDERMAN (http://www.cs.umd.edu/~ben) is a Professor in the Department of Computer Science and Founding Director (1983-2000) of the Human-Computer Interaction Laboratory (http://www.cs.umd.edu/hcil/) at the University of Maryland. He was elected as a Fellow of the Association for Computing (ACM) in 1997, a Fellow of the American Association for the Advancement of Science (AAAS) in 2001, and a Member of the National Academy of Engineering in 2010. He received the ACM SIGCHI Lifetime Achievement Award in 2001.

Title: Fractionating the Rational Brain

PROFESSOR VINOD GOEL
York University, Canada
http://www.yorku.ca/vgoel

Abstract
Considerable progress has been made over the past decade in our understanding of the neural basis of logical reasoning. Unsurprisingly, these data are telling us that the brain is organized in ways not anticipated by cognitive theory. In particular, they're forcing us to confront the possibility that there may be no unitary reasoning system in the brain (be it mental models or mental logic). Rather, the evidence points to a fractionated system that is dynamically configured in response to certain task and environmental cues. I will review three lines of demarcation including (a) systems for heuristic and formal processes (with evidence for some degree of content specificity in the heuristic system), (b) conflict detection/resolution systems, and (c) systems for dealing with certain and uncertain inferences; and then offer a tentative account of how the systems might interact to facilitate logical reasoning. Sensitivity to data generated by neuroimaging and patient methodologies will move us beyond the sterility of mental models vs. mental logic debate and further the development of cognitive theories of reasoning.

Biography
Vinod Goel studied architectural design and computer science as an undergraduate. He received his PhD in Cognitive Science from UC-Berkeley, followed by postdoctoral training in cognitive neuroscience at the NIH, USA and Institute of Neurology/UCL, UK. He is currently a Professor of Cognitive Neuroscience at York University, Canada, and the University of Hull, UK. His research uses brain imaging (fMRI) and lesion analyses techniques to study the cognitive, computational, and neural basis of rational thought processes ranging from logical inference to design problem-solving. This work has resulted in numerous, highly cited publications and has been recognized by a number of awards, including the McDonnell-Pew Program in Cognitive Neuroscience Award.
Title: Cognitive Informatics and Denotational Mathematical Means for Brain Informatics

PROFESSOR YINGXU WANG
University of Calgary, Canada
http://enel.ucalgary.ca/People/wangyx/

Abstract
The contemporary wonder of sciences and engineering has recently refocused on the beginning point of them: how the brain processes internal and external information autonomously and cognitively rather than imperatively as those of conventional computers. Cognitive Computing (CC) is an emerging paradigm of intelligent computing methodologies and systems that implements computational intelligence by autonomous inferences and perceptions mimicking the mechanisms of the brain. CC is emerged and developed based on the transdisciplinary research in cognitive informatics and abstract intelligence. Cognitive Informatics (CI) [Wang 2002] is a transdisciplinary enquiry of computer science, information science, cognitive science, brain science, and intelligence science that investigates into the internal information processing mechanisms and processes of the brain and natural intelligence, as well as their engineering applications. The theoretical framework of cognitive informatics covers the Layered Reference Model of the Brain (LRMB), the Object-Attribute-Relation (OAR) model of information representation in the brain, the cognitive informatics model of the brain, and neuroinformatics. Recent studies on LRMB in cognitive informatics reveal an entire set of cognitive functions of the brain and their cognitive process models, which explain the functional mechanisms and cognitive processes of the natural intelligence with 43 cognitive processes at seven layers known as the sensation, memory, perception, action, meta-cognitive, meta-inference, and higher cognitive layers from the bottom up. Abstract Intelligence (aI) [Wang, 2008] and Denotational Mathematics (DM) [Wang, 2000, 2009] play an important role in cognitive informatics, brain informatics, and cognitive computing. aI is a universal mathematical form of intelligence that transfers information into actions and behaviors; while DM is a category of expressive mathematical structures that deals with high-level mathematical entities beyond numbers and sets, such as abstract objects, complex relations, perceptual information, abstract concepts, knowledge, intelligent behaviors, behavioral processes, and systems. The latest advances in CI and CC have led to a systematic solution for explaining brain informatics and the future generation of intelligent computers. A wide range of applications of CI, aI, CC, and DM have been recognized in brain informatics toward the implementation of highly intelligent systems such as world-wide wisdom (WWW+), cognitive knowledge search engines, autonomous learning machines, and cognitive robots.

Biography
Dr. Yingxu Wang is professor of cognitive computing and software engineering, Director of International Institute of Cognitive Informatics and cognitive computing (IICICC), and Director of Theoretical and Empirical Software Engineering Research Center (TESERCC) at the University of Calgary, Canada. He is a Fellow of WIF, a P.Eng of Canada, a Senior Member of IEEE and ACM, and a member of ISO/IEC JTC1 and the Canadian Advisory Committee (CAC) for ISO. He received a PhD in Software Engineering from the Nottingham Trent University, UK, in 1997, and a BSc in Electrical Engineering from Shanghai Tiedao University in 1983. He has industrial experience since 1972 and has been a full professor since 1994. He was a visiting professor in the Computing Laboratory at Oxford University in 1995, Dept. of Computer Science at Stanford University in 2008, and the Berkeley Initiative in Soft Computing (BISC) Lab at University of California, Berkeley in 2008, respectively. He is the founder and steering committee chair of the annual IEEE International Conference on Cognitive Informatics (ICCI). He is founding Editor-in-Chief of International Journal of Cognitive Informatics and Natural Intelligence (IJCINI), founding Editor-in-Chief of International Journal of Software Science and Computational Intelligence (IJSSCI), Associate Editors of IEEE Transactions on System, Man, and Cybernetics (Part A), Journal of Advanced Mathematics and Applications (JAMA), and International Journal of Applied Metaheuristic Computing (IJAMC), as well as Editor-in-Chief of CRC Book Series in Software Engineering. Prof. Wang is the initiator of a number of cutting-edge research fields or subject areas such as cognitive informatics, abstract intelligence, cognitive computing, cognitive computers, denotational mathematics (i.e., concept algebra, system algebra, real-time process algebra, granular algebra, visual semantic algebra, and inference algebra), software science (i.e., theoretical software engineering and mathematical laws of software engineering), coordinative work organization theory, deductive semantics, LRMB, the reference model of autonomous agent systems, cognitive complexity of software, and built-in tests (BITS). He has published over 110 peer reviewed journal papers, 200+ peer reviewed full conference papers, and 12 books in cognitive informatics, software engineering, and computational intelligence. He is the recipient of dozens international awards on academic leadership, research achievements, best papers, and teaching in the last 36 years.
Title: Active Smart u-Things and Cyber Individuals

PROFESSOR JIANHUA MA
Hosei University, Japan
http://cis.k.hosei.ac.jp/~jianhua/

Abstract
Due to the continuing miniaturization of chips and availability of wired/wireless communications, many kinds/forms of devices can be integrated into physical objects and ambient environments. The u-things, as opposed to pure digital e-things existing on computers/Web/Internet, are ordinary physical things with attached, embedded or blended computers, networks, and/or some other devices such as sensors, actors, e-tags and so on. Active smart u-things are ones that can, more or less, sense, compute, communicate, and may take some actions according to their goals, situated contexts, usersâ€™ needs, etc. Active smart u-things can be with different levels of intelligence from low to high, and in various intelligent forms, e.g., aware, context-aware, interactive, reactive, proactive, assistive, adaptive, automated, autonomic, sentient, perceptual, organic, life-like, cognitive, thinking, etc. Active smart u-things may cover innumerable types of physical things in the real world. They can be roughly classified into three categories, i.e., smart object, smart space and smart system, according to their appearances and functions. The grand challenge is how to enable these smart u-things to offer desired services to all people in right time, right place and right means with ubiquitous guarantee. Furthermore, the essential and existence of human in cyber-physical combined spaces should be re-examined. The Cyber Individual, with a short term â€˜Cyber-Iâ€™, is a real individualâ€™s counterpart in cyberspace. Cyber-I can be seen as a comprehensive description of a real individual including oneâ€™s physical status, physiological states, psychological behaviors, personal features, social relations, history experiences, etc. Such kind of individual description and modeling is fundamental to offer personalized services to different users according to their needs and situations.

Biography
Jianhua Ma is a Professor at the Faculty of Computer and Information Sciences of Hosei University since 2000. Previously, he had 15 years' teaching/research experience at NUDT, Xidian University and the University of Aizu (Japan). His research from 1983 to 2003 covered wireless communications, data encryption, speech processing, multimedia QoS, 1-to-m HC hyper-interface, graphics ASIC, e-learning and virtual university, CSCW, multi-agents, Internet audio/video, mobile web service, P2P network, etc. Since 2003 he has been devoted to what he called Smart World/Hyperworld pervaded with smart physical u-things, characterized with Ubiquitous Intelligence (u-Intelligence, UI) for u-Services with UbiSafe guarantee. Dr. Ma has published over 200 papers in journals and proceedings, and edited over 10 books. He is a Co-Editor-in-Chief of JUCI, JMM, JoATC, JPCC and IJUNESST. He is on the editorial boards of IJCPOL, IJDET, IJWMC, IISH, IJSIA, IJDTA, IJCIT and IJAS, and has edited over 15 journal special issues as a Guest Editor. He organized the 6th Int'l Conf. on Distributed Multimedia Systems (DMS'99) as a PC Co-Chair, the 1st Int'l Conf. on Cyber Worlds (CW'02) as one of founders and PC Co-Chairs, the 18th IEEE Int'l Conf. on Advanced Information Networks and Applications (AINA'04) as a General Co-Chair, and the 1st IEEE Int'l Conf. on Social Computing (SocialCom'09) as an Advisory Chair. He is a founder of Int'l Conf. on Ubiquitous Intelligence and Computing (UIC), Int'l Conf. on Autonomic and Trusted Computing (ATC), and IEEE/ACM Conf. on Cyber, Physical and Social Computing (CPSCCom). He is a Chair of IEEE CIS Task Force on Autonomic and Trusted Computing, and a co-founder of IEEE Task Force on Ubiquitous Intelligence and Computing.
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