ISABEL 2006

International Symposium on Artificial Brain with Emotion and Learning

- Bio-Inspired Models and Hardware for Brain-like Intelligent Functions -

August 24-25, 2006
Yonsei University, Seoul, Korea

Symposium Co-Chairs

Soo-Young Lee
Director, Brain Science Research Center
Korea Advanced Institute of Science and Technology

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Director, Cognitive Science Research Center
Yonsei University

Objectives

This symposium aims to bring together international researchers from the cognitive neuroscience and engineering communities for biologically-inspired models and system implementations with human-like intelligent functions. The previous meeting was held as a post-IJCNN Symposium on Bio-Inspired Models and Hardware (BIMH2005) at Montreal, Canada, on August 5, 2005.

Although artificial neural networks are based on information processing mechanisms in our brain, there still exists a big gap between the biological neural networks and artificial neural networks. The more intelligence we would like to incorporate into artificial intelligent systems, the more biologically-inspired models and hardware are required. Fortunately the cognitive neuroscience has been developed enormously during the last decade, and engineers now have more to learn from the science.

In this symposium we will discuss what engineers want to learn from the science and how the scientists may be able to provide the knowledge. Then, mathematical models will be presented with more biological plausibility. The hardware and system implementation will also be reported with the performance comparison with conventional methods for real-world complex applications. A panel will be organized for the future research directions at the end.

This symposium will promote synergetic interaction among cognitive neuroscientists, neural networks and robotics engineers, and result in **more biologically-plausible mathematical models and hardware systems with more human-like intelligent performance** in real-world applications.

Symposium Topics

- Models of auditory pathway
- Models of visual pathway
- Models of cognition, learning, and inference
- Models of attention, emotion, and consciousness
- Models of autonomous behavior
- Hardware implementation of bio-inspired models
- Engineering applications of bio-inspired models

Expected Attendees and Symposium Format

The symposium is aimed to be a high communicative forum for researchers from the cognitive neuroscience, artificial neural networks, and robotics communities. **The prospective authors are invited to submit one page summary by e-mail to isabel2006@neuron.kaist.ac.kr.** The submitted papers will be fully refereed by the Program Committee and accepted based on the quality of the papers.

The symposium will go on two full days with oral session with invited and contributed presentations, one panel discussion session, and one poster session. To encourage exchange of ideas at least 20 minutes will be allocated for each talk with additional 10 minutes for discussion.

Important Dates

May 20, 2006	Extended deadline for summary (1 page)
June 20, 2006	Acceptance notification
July 20, 2006	Camera-ready notes due

Organized by **Brain Science Research Center, KAIST**
Cognitive Science Research Center, Yonsei University
International Neural Network Society SIG-Korea

Sponsored by **Air Force Office of Scientific Research, Asian Office of Aerospace Research and Development**

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Symposium Booklet

To include up-to-date information and unpublished recent results on the presentation, the workshop booklet will be published with one-page summary and presentation materials only. The extended version or combined reviews of the selected presented papers will be invited as a special issue of the Neural Information Processing – Letters and Reviews (www.nip-lr.info).

Confirmed Invited Speakers

Models of auditory and visual pathways

Kunihiko Fukushima, Tokyo University of Technology, Japan
Visual Motion Analysis by a Neural Network

Daniel D. Lee, University of Pennsylvania, USA
Invariant manifold recognition of facial expression

Te-Won Lee, University of California - San Diego, USA
Independent Vector Analysis

Models of cognition, learning, and inference

Allan Kardec Barros, Universidade Federal do Maranhao, Brazil
Redundancy reduction: a strategy employed by the brain for information processing?

Sebastian Seung, MIT, USA
Representing part-whole relationships in recurrent neural networks

Jun Wang, Chinese University of Hong Kong, China
Neurodynamic Optimization: Beyond of Convexity

Bo Zhang, Tsinghua University, China
Hierarchical Machine Learning - A learning methodology inspired by human's intelligence

Mingsheng Zhao, Tsinghua University, China
The TAF Neuron Model and Learning Algorithms for the TAF Neural Networks

Models of attention, emotion, and consciousness

Wlodek Duch, Nicolaus Copernicus University, Poland
Neurocognitive Approach to Computational Creativity

Models of autonomous behavior

Robert Kozma, University of Memphis, USA
Dynamical Systems Approach to Intentional Robots

Hardware implementation of bio-inspired models

Seiji Aoyagi, Department of Systems Management Engineering, Kansai University, Japan
Recognition of Contact State by using Neural Network for Micromachined Array Type Tactile Sensor

Giacomo Indiveri, ETH Zurich, Switzerland
Multi-chip reconfigurable networks of VLSI spiking neurons with spike-based learning synapses

Intelligent Robots

Giulio Sandini, University of Genoa, Italy
Humanoid babies

Jun Tani, RIKEN Brain Science Institute, Japan
Neuro-Cognitive Robotics: Experiments, Analysis and Interpretations

NeuroImaging

Dae-Shik Kim, Boston University, USA
Multiparametric Imaging of Brain Structure and Function

Seung-Schik Yoo, Harvard Medical School, USA
Brain-Computer-Interface using functional MRI: Thought-controlled Keyboard and Mouse