

# BIONETICS 2006 Technichal Program

December 11-13 - Cavalese, Italy

## Day 1: Monday, 11 Dec 2006

**8:30** Opening Remarks

**9:00** **Keynote: *Biologically Inspired Artificial Compound Eyes and Optofluidic Systems***  
**Prof. Luke P. Lee** (Department of Bioengineering, University of California at Berkeley, USA)

**10:30** Coffee Break

**11:00** **Session 1: Bio-inspired Networks and Communication Systems**

*Session Chair: Kenji Leibnitz, Osaka University, Japan.*

**Paper:** *Stepwise Probabilistic Buffering for Epidemic Information Dissemination*

**Authors:** Emrah Ahi, Mine Çağlar, Öznur Özkasap

**Paper:** *Understanding the Spread of Epidemics in Highly Partitioned Mobile Networks*

**Authors:** Iacopo Carreras, Daniele Miorandi, Geoffrey S. Canright, Kenth Engo-Monsen

**Paper:** *ImmuneSystem Based Distributed Node and Rate Selection in Wireless Sensor Networks*

**Authors:** Baris Atakan, Ozgur B. Akan

**Paper:** *Fireflies as Role Models for Synchronization in Ad-Hoc Networks*

**Authors:** Alexander Tyrrell Gunther Auer, Christian Bettstetter

**12:40** Lunch Break

**14:00** **Session 2: Bio-inspired and bio-based nano-scale communication and information systems**

*Session chair: Yuki Moritani, NTT DoCoMo Inc., Japan*

**Paper:** *Towards in vivo computing: Quantitative analysis of an artificial gene regulatory network behaving as a RS flip-flop and simulating the system in silico*

**Authors:** Sikander Hayat, Kai Ostermann, Lutz Brusch, Wolfgang Pompe, Gerhard Rödel

**Paper:** *Evolving Artificial Cell Signaling Networks using Molecular Classifier Systems*

**Authors:** James Decraene, George Mitchell, Barry McMullin

**Paper:** *Logical Nano-Computation in Enzymatic Reaction Networks*

**Authors:** Martin Stetter, Bernd Schurmann, Michael Hofstetter

**Paper:** *A New Channel Coding Algorithm Based on Photo-Proteins and GTPases*

**Authors:** Jian-Qin Liu, Hidefumi Sawai

**15:40** Coffee Break

**16:00** **Session 3: Bio-inspired mathematical models, methods and tools**

*Session chair: Andreas Deutsch, Dresden University of Technology, Germany*

**Paper:** *Development of an Artificial Neural Network*

**Authors:** Antonio Soriano Payá, Daniel Ruiz Fernández, David Gil Méndez, Carlos Alberto Montejo Hernández

**Paper:** *An ant algorithm for static and dynamic MAX-SAT problems*

**Authors:** Pedro C. Pinto, Thomas A. Runkler, Joao M. C. Sousa

**Paper:** *Strategies for containing an influenza pandemic: the case of Italy*

**Authors:** Stefano Merler, Giuseppe Jurman, Cesare Furlanello, Caterina Rizzo, Antonino Bella, Marco Massari, Marta Luisa Cio degli Atti

**Paper:** *Stochastic Immune Layer Optimizer*  
**Authors:** G. Jarmoszewicz, K. Swirski, K. Wojdan

**19:00 Social Dinner**

**Day 2: Tuesday, 12 Dec 2006**

**8:30 Session 4: Bio-inspired Software**

*Session Chair:* Stephan Steglich, TU Berlin, Germany

**Paper:** *Exploring Biologically-inspired Evolvable Network Applications with the BEYOND Architecture*

**Authors:** Chonho Lee, Hiroshi Wada and Junichi Suzuki

**Paper:** *Organization-oriented chemical programming for the organic design of distributed computing systems*

**Authors:** Naoki Matsumaru and Peter Dittrich

**Paper:** *Bio-inspired Context Gathering in Loosely Coupled Computing Environments*

**Authors:** Carsten Jacob, David Linner, Stephan Steglich, Ilya Radusch

**Paper:** *A Neuro-Fuzzy Approach to Diagnosis of Neonatal Jaundice*

**Authors:** Mohammad Sohani, Nasser Sadati, Behrooz Makky

**Paper:** *Digital Ecosystems: Evolving Service-Orientated Architectures*

**Authors:** Gerard Briscoe, Philippe De Wilde

**10:45 Coffee Break**

**11:15 Poster Session**

**Paper:** *A Molecular Communication Interface Using Liposomes with Gap Junction Proteins*

**Authors:** Yuki Moritani, Shin-ichiro M. Nomura, Satoshi Hiyama, Kazunari Akiyoshi, Tatsuya Suda

**Paper:** *Simulation of a Molecular Motor Based Communication Network*

**Authors:** Michael Moore, Akihiro Enomoto, Tadashi Nakano, Tatsuya Suda, Atsushi Kayasuga, Hiroaki Kojima, Hitoshi Sakakibara, Kazuhiro Oiwa

**Paper:** *Controlled Propagation in Molecular Communication Using Tagged Liposome Containers*

**Authors:** Y. Sasaki, M. Hashizume, K. Maruo, N. Yamasaki, J. Kikuchi, Y. Moritani, S. Hiyama, T. Suda

**Paper:** *Quantum information retrieval and gene networks*

**Authors:** Dimitri Petritis and Thomas Sierocinski

**Paper:** *Modeling of Vocal Tract*

**Authors:** Zygmunt Ciota, Małgorzata Napieralska, Andrzej Napieralski

**Paper:** *A Cell-based Molecular Communication Network*

**Authors:** Tadashi Nakano, Michael Moore, Akihiro Enomoto, Tatsuya Suda, Takako Koujin, Tokuko Haraguchi, Yasushi Hiraoka

**12:40 Lunch Break**

**14:00 Session 5: Bio-inspired security mechanisms**

*Session Chair:* Fabio Martinelli, IIT-CNR, Italy

**Paper:** *Bio-inspired Promoters and Inhibitors for Self-Organized Network Security Facilities*

**Authors:** Falko Dressler

**Paper:** *Crypto-fraglets: networking, biology and security*

**Authors:** Marinella Petrocchi

**Paper:** *Cooperative Forensics Sharing*

**Authors:** Fareed MZaffar

**Paper:** *Proactive Attentive Support System*

**Authors:** Johan de Heer, Sorin M. Iacob, Alfons H. Salden, Wouter Teeuw

**15:40 Coffee Break**

**16:00 Panel: *Nano scale communications and computing***

*Panel Moderator:* Tadashi Nakano, University of California, Irvine, USA

*Panelists:* Yuki Moritani, Martin Stetter, Jian-Qin Liu, Tadashi Nakano

### Day 3: Wensday 13 Dec 2006

**9:00 Session 6: Bio-inspired Networks and Communication Systems**

*Session Chair:* Stephan Steglich, TU Berlin, Germany

**Paper:** *A Bio-Inspired Architecture for Division of Labour in SANETs*

**Authors:** Thomas Halva Labella, Falko Dressler

**Paper:** *Self-Organization for Search in Peer-to-Peer Networks: The Exploitation-Exploration Dilemma*

**Authors:** Elke Michlmayr

**Paper:** *Biologically Inspired Self-Governance and Self-Organisation for Autonomic Networks*

**Authors:** Sasitharan Balasubramaniam, Dmitri Botvich, William

Donnelly, Mícheál Ó Foghlú, John Strassner

**Paper:** *Non-Intrusive Quality Evaluation of VoIP Using Genetic Programming*

**Authors:** Adil Raja, R. Muhammad Atif Azad, Colin Flanagan, Dorel Picovici, Conor Ryan

**10:45 Coffee Break**

**11:15 Session 7: Bio-inspired Networks and Communication Systems (Work in Progress)**

*Session Chair:* Kenji Leibnitz, Osaka University, Japan

**Paper:** *Overlay Network Symbiosis: Evolution and Cooperation*

**Authors:** Naoki Wakamiya, Masayuki Murata

**Paper:** *A new bio-inspired location search algorithm for peer-to-peer network based Internet telephony*

**Authors:** Sachin Kulkarni, Niloy Ganguly, Geoffrey Canright, Andreas Deutsch

**Paper:** *An Ecology-Based Adaptive Network Control Scheme for Radio Resource Management in Heterogeneous Wireless Networks*

**Authors:** Jie Chen, Kai Yu, Guang Yang, ZhiYong Feng, Yang Ji, Ping Zhang, Qing Huang, Yong Bai, Lan Chen, Masahiro Minomo

**Paper:** *The Adaptive Social Hierarchy - A Self Organizing Network Based on Naturally Occuring Structures*

**Authors:** Andrew Markham, Andrew Wilkinson

**12:40 Lunch Break**

**14:00 Session 8: Bio-inspired Networks and Communication Systems (Work in Progress)**

*Session chair:* Kenji Leibnitz, Osaka University, Japan

**Paper:** *A Library Framework for Implementing Genetic Algorithms in Java*

**Authors:** Bartosz Kozlowski, Varvara Fazalova

**Paper:** *A Heuristic Routing Mechanism Using a New Addressing Schemes*

**Authors:** M. Ravanbakhsh, Y. Abbasi-Yadkori, M. Abbaspour, H. Sarbazi-Azad

**Paper:** *A Conceptual Framework for Bio-Inspired Congestion Control In Communication Networks*

**Authors:** Morteza Analoui and Shahram Jamali

**15:00 Coffee Break**

**15:30 Panel: BIONETICS: a methodology or a source of inspiration?**

*Panel Moderator:* Masayuki Murata Osaka Univ., Japan

*Panelists:* Andreas Deutsch, Stephan Steglich, Fabio Martinelli, Kenji Leibnitz, Yuki Moritani