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IEEE Journal on Selected Areas in Communications (JSAC)

<p style="text-align:center">BIO-INSPIRED NETWORKING</p>

Technology is taking us to a world where myriads of massively networked devices interact with the physical world in multiple ways, and at multiple scales, from the global Internet down to micro- and nano-devices. Many of these devices are highly mobile and autonomous, and must adapt to the surrounding environment in a totally distributed and unsupervised way.

Recently, a number of approaches inspired by biological mechanisms and phenomena have been proposed as a strategy to handle the complexity of massively distributed systems such as the Internet, or wireless ad hoc and sensor networks. The goal of bio-inspired approaches is to discover and to adapt biological methods to technical solutions that are showing similarly high stability, adaptability, and scalability, as biological entities often have.

This special issue intends to highlight the latest achievements in the new research domain of bio-inspired networking. In particular, the issue focuses on methodologies for identifying relevant biological mechanisms, the modeling of these mechanisms, and their application to technical solutions. Prospective papers are expected to outline either proof of concept studies with direct comparison to classical technical solutions, or theoretical mathematical models of biological principles associated with fundamental challenges in communication systems. For this special issue, we consider all techniques with direct biological background including animal learning strategies, self-organizing methods as observed from swarms down to nano-structures that are observed and analyzed in molecular biology. Classical complex systems research is explicitly excluded from the scope whereas a comparison to well-known techniques in this domain is appreciated.

This special issue is dedicated to bio-inspired approaches addressing various aspects of networking and communication systems. The topics of interest include the following domains:

- Self-organizing communication systems
- Evolutionary and adaptive systems and protocols
- Scalable systems and protocols
- Self-learning algorithms
- Self-healing systems and protocols
- Security mechanisms
- Network algorithms and protocols
- Scalable and adaptive network architectures
- Congestion control mechanisms
- Performance evaluation of bio-inspired networks

Original unpublished contributions, and invited articles will be considered for the issue. The papers should be formatted according to IEEE-JSAC guidelines. Authors should submit a PDF version of their complete manuscript via email to dressler@ieee.org according to the following timetable:

Manuscript Submission:	March 1, 2009
Acceptance Notification:	September 1, 2009
Final Manuscript due to Pub:	December 1, 2009
Publication:	2nd quarter 2010

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