

Editorial

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It is a great pleasure to write this Editorial of the signaling first issue of the *Evolving Systems: An Interdisciplinary Journal of Advanced Science and Technology* which was planned and prepared for several years. First of all, we are very thankful to Springer and personally to Tomas Ditzinger for the support and encouragement; we are also indebted to the Editorial Board and contributors who make possible this journal.

The aim of the journal is clearly stated as ‘to cover surveys, methodological, and application-oriented papers in the emerging area of *evolving systems*’. Evolving systems belong to the class of intelligent systems. Traditionally, expert knowledge and off-line methods of learning/training of a pre-specified system structure were used in the last century. Faced with the ever-growing amount of data that are often not static but streaming and often with complex statistical characteristics, the direction of self-development seemed to be the right one. The self-development, however, also requires an important element of evolving in terms of system structures to be flexible, not

pre-fixed. *Evolving systems* are inspired by the idea of system model evolution in a dynamically changing and evolving environment.

This emerging area of research of *evolving intelligent systems* was conceived around the turn of the centuries with some important achievements in the areas of neural networks and fuzzy rule-based systems, neuro-fuzzy hybrids. It is currently being expanded also to the areas of general systems, control, hardware implementations, etc. Numerous interesting applications of such systems to robotics, autonomous unmanned systems, vehicle systems, process monitoring & control, bio-medical data processing etc., have been reported.

The journal will solicit publications that address the problems of modelling, control, prediction, classification and data processing in non-stationary, unpredictable environments and describe new methods and approaches for design of systems able to fully adapt their structure rather than adjust their parameters based on a pre-trained and fixed structure. The journal will be devoted to the topic of self-developing, self-organised, and evolving systems in its entirety—from systematic methods to case studies and real industrial applications. The journal will cover a broad range of related methodologies and technologies, but will also be considering new paradigms and application areas, including medicine, robotics, business, industrial automation, control systems, transportation, communications, environmental monitoring, biomedical systems, security, and electronic services. The papers considered for publication are expected to focus on the broad concept of dynamically evolving knowledge and intelligence.

The journal is the culmination of an exponentially growing set of activities in this emerging area of research, including a recognition by IEEE and creation of the Task Force on Evolving and Adaptive Intelligent Systems and a

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series of IEEE supported conferences specifically dedicated to this topic, e.g.

- 2006 IEEE Symposium on Evolving Fuzzy Systems, Ambleside, UK;
- the Tutorial Workshop on *Evolving Intelligent Systems: The Knowledge Engineering Approach*, IEEE Symposium Series on Computational Intelligence, Hawaii, USA, April 2007;
- IEEE International Workshop on Genetic and Evolving Fuzzy Systems, Witten, Germany, 2008;
- the Workshop on *Neurocomputing and Evolving Intelligence* (NCEI2008), Auckland, New Zealand, 2008;
- the 2009 IEEE International Workshop on Self-Developing Evolving Intelligent Systems (ESDIS 2009) which was organized in the framework of the IEEE Symposium Series on Computational Intelligence, Nashville, TN, USA, April 2009;
- Evolving Intelligent Systems Workshop (EIS'10), Leicester, UK, April 2010;
- IEEE International Workshop on Evolving and Adaptive Intelligent Systems (EAIS-2011) in the framework of IEEE Symposium Series on Computational Intelligence, Paris, France, April 2011

The journal will operate a double blind review system with minimum three independent reviews required to proceed. At the same time, one of the main aims of the Editors is to minimize the processing time (our goal is that it should not exceed 4–6 months). All the papers that were carefully selected for the signalling first issue underwent such a process. They cover both the methodological and application aspects of evolving intelligent systems.