Special issue of *Evolving Systems* on

*Applications of Evolving Connectionist Systems*

**Guest Editor**

Michael J. Watts  
University of Adelaide, Australia  
mjwatts@ieee.org

**Scope**

The topic of this special issue is “Applications of Kasabov’s Evolving Connectionist Systems”.

In modern society, the volume and rate of data production are huge and set to increase. To process and utilise this avalanche of data, methods are needed that can rapidly and accurately model it as it becomes available. These models must be able to learn throughout their lifetimes, without forgetting what they have previously learned, and be able to explain themselves.

Kasabov’s Evolving Connectionist Systems (ECoS) are able to fulfil each of these requirements. They are a class of constructive neural networks that learn via structural growth and adaptation. They have a fast, one-pass learning algorithm, where all that can be learnt from the data is learned in the first training pass. Because of their open structure, they exhibit continuous, life-long learning whereby the structure expands as necessary to accommodate new data. Finally, they have a strong resistance to catastrophic forgetting following additional training on new data.

Examples of ECoS networks include the Evolving Fuzzy Neural Network (EFuNN), which was the first ECoS network published and is characterised by embedded fuzzy logic elements. There is also the Simple Evolving Connectionist System (SECoS), which is essentially an EFuNN with the fuzzy elements removed, and the Dynamic Evolving Fuzzy Inference System (DENFIS) for discovering Takagi-Sugeno style fuzzy rules. Many ECoS networks use fuzzy rule extraction algorithms that allow for the explanation of what the networks have learned, in a comprehensible manner.

ECoS networks are well suited to applications that are dealing with new data continuously and that have dynamic, time-critical aspects. Previous applications of ECoS include:

- Stock market prediction and macroeconomic modelling
- Speech recognition, especially multi-speaker speech recognition
- Bioinformatics and medical modelling
- Image and video parsing
- Robot control
- Information system security
The special issue is concerned with all aspects of the application of ECoS networks to real-life problems and data sets. Topics of interest include, but are not limited to:

- Applications of ECoS to real-world problems
- Data mining of complex data sets using ECoS
- Comparisons of ECoS with other algorithms over real-world data sets
- Modifications of ECoS algorithms to fit them to real-world problems

**Proposed Schedule**

- Submission due date: 14 May, 2012
- Preliminary notification of acceptance: 4 June, 2012
- Revised manuscripts due: 9 July, 2012
- Final acceptance notification: 6 August, 2012
- Final version due: 3 September, 2012
- Intended publication date: January, 2013

**Submission**

The special issue invites original contributions within the specified scope. Manuscripts must not be under review elsewhere, nor can they have been previously published. Extended conference papers must contain at least 30% new material. Please format all manuscripts according to the Instructions for Authors:


Please submit all papers via the online submission system:

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