Derong Liu, Chin-Teng Lin, Garry Greenwood, Simon Lucas, and Zhengyou Zhang

CIS Publication Spotlight

IEEE Transactions on Neural Networks

Online Blind Source Separation Using Incremental Nonnegative Matrix Factorization With Volume Constraint, by G. Zhou, Z. Yang, S. Xie, and J.-M. Yang, *IEEE Transactions on Neural Networks*, Vol. 22, No. 4, April 2011, pp. 550–560.

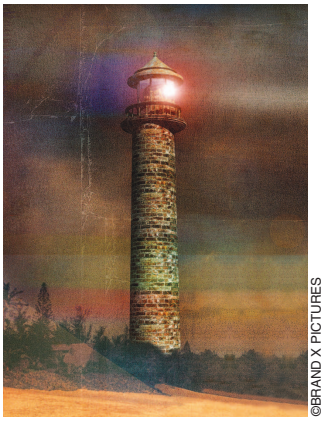
Digital Object Identifier: 10.1109/TNN.2011.2109396

"Online blind source separation (BSS) can overcome the high computational cost problem, which limits the practical applications of traditional batch BSS algorithms. However, existing online BSS methods are mainly used to separate independent or uncorrelated sources. In this paper, an incremental nonnegative matrix factorization (NMF) with volume constraint is derived and utilized for solving online BSS, which can be used to separate correlative sources. The volume constraint to the mixing matrix enhances the identifiability of the sources, while the incremental learning mode reduces the computational cost. This new method takes advantage of the natural gradient based multiplication updating rule, and it performs especially well in the recovery of dependent sources."

Learning Ensembles of Neural Networks by Means of a Bayesian Artificial Immune System, by P. A. D. Castro, and F. J. Von Zuben, *IEEE Transactions on Neural Networks*, Vol. 22, No. 2, Feb. 2011, pp. 304–316.

Digital Object Identifier: 10.1109/TNN.2010.2096823

"An immune-inspired approach, Bayesian artificial immune system, is used to design ensembles of heterogeneous neural networks for classification problems. It is an estimation of distribution algorithm that replaces the traditional mutation and cloning operators with a probabilistic model. Among the additional attributes provided by the Bayesian framework inserted into an immune-inspired search algorithm are the automatic control of the population size along the search and the inherent ability to promote and preserve diversity among the candidate solutions. Both are attributes generally absent from alternative estimation of distribution algorithms, and both have been shown to be useful attributes when implementing the generation and selection of components of the ensemble, thus leading to high-performance classifiers."



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IEEE Transactions on Fuzzy Systems

On the Continuity of Type-1 and Interval Type-2 Fuzzy Logic Systems, by Dongrui Wu, and Jerry M. Mendel, *IEEE Transactions on Fuzzy Systems*, Vol. 19, No. 1, February 2011, pp. 179–192.

Digital Object Identifier: 10.1109/TFUZZ.2010.2091962

"This paper studies the continuity of the input–output mappings of fuzzy logic systems (FLSs), including both type-1 (T1) and interval type-2 (IT2) FLSs. By showing a continuous input–output mapping, the authors demonstrated that a T1 FLS is a universal approximator. This paper is to date the most comprehensive study on the continuity of FLSs. The results will be very useful in the selection of the parameters of the membership functions to achieve a desired continuity."

Seclusion-Factor Method to Solve Fuzzy-Multiple Criteria Decision-Making Problems, by Abdollah Hadi-Vencheh and Mahdi Mirjaberi, *IEEE Transactions on Fuzzy Systems*, Vol. 19, No. 2, April 2011, pp. 201–209.

Digital Object Identifier: 10.1109/TFUZZ.2010.2091135

"This paper incorporates the basic concepts of subjectivity with the objective of decision theory to develop a method which intellectualizes ambiguity into multiple-criteria decision making (MCDM) problems. An

Digital Object Identifier 10.1109/MCI.2011.941585
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outranking intensity is introduced to determine the degree of the overall outranking between competing alternatives, which are represented by fuzzy numbers. The comparison of these degrees is made through the concept of overall existence ranking index. Comparative examples, as well as a case study, are given to illustrate the approach."

IEEE Transactions on Evolutionary Computation

Efficient Hybrid-Game Strategies Coupled to Evolutionary Algorithms for Robust Multidisciplinary Design Optimization in Aerospace Engineering, by H. Ishibuchi, N. Tsukamoto and Y. Nojima, *IEEE Transactions on Evolutionary Computation*, Vol. 15, No. 2, April 2011, pp. 133-150.

Digital Object Identifier: 10.1109/TEVC.2010.2043364

"Game strategies have been effectively used to solve design optimization problems in a number of fields including economics, engineering, computer science and biology. In this paper Nash-equilibrium and Pareto-optimality concepts are combined to create a design optimization framework. This paper shows how game strategies can be coupled to multi-objective evolutionary algorithms and robust design techniques to produce a set of high quality solutions. The benefits of using hybrid and non-hybrid-game strategies are also demonstrated."

Toward an Evolutionary Computing Modeling Language, by H. Aydt, S. Turner, W. Cai, M. Low, Y. Ong and R. Ayani, *IEEE Transactions on Evolutionary Computation*, Vol. 15, No. 2, April 2011, pp. 230-247.

Digital Object Identifier: 10.1109/TEVC.2010.2081368

"Domain knowledge is essential for designing effective evolutionary algorithms, but a unifying framework for designing specialized evolutionary algorithms across problem domains does not exist. This paper introduces an evolutionary computing modeling language (ECML). By separating problem-specific domain knowledge from the EA implementation, the authors show that a unified framework for evolutionary computation can be attained. A number of examples are given to illustrate the approach."

IEEE Transactions on Computational Intelligence and AI in Games

Launchpad: A Rhythm-Based Level Generator for 2-D Platformers, by G. Smith, J. Whitehead, M. Mateas, M. Treanor, J. March, and Cha Mee, *IEEE Transactions on Computational Intelligence and AI in Games*, Vol. 3, No. 1, March 2011, pp. 1-16.

Digital Object Identifier: 10.1109/TCIAIG.2010.2095855

"Platform games are a major game genre where the aim is to traverse each level by running and jumping across a series of platforms, collecting tokens and avoiding traps and enemies. This paper describes a novel method for creating new levels by piecing together small segments called rhythm groups using a grammar, and then automatically rating each level using a series of design heuristics. Generation can be controlled using a set of parameters that influence the level pacing and geometry, and the levels are guaranteed to be playable."

IEEE Transactions on Autonomous Mental Development

Dynamic Neural Fields as Building Blocks of a Cortex-Inspired Architecture for Robotic Scene Representation, by Stephan K. U. Zibner, Christian Faubel, Ioannis Iossifidis, and Gregor Schöner, Vol. 3, No. 1, March 2011, pp. 74-91.

Digital Object Identifier: 10.1109/TAMD.2011.2109714

"This paper presents an architecture that autonomously generates scene representations by controlling gaze and attention, creating visual objects in the foreground, tracking objects, reading them into working memory, and taking into account their visibility. At the core of this architecture are three-dimensional dynamic neural fields (DNFs) that link feature to spatial information. A series of robotic experiments demonstrate how the DNF architecture provides the core functionalities of a scene representation."

President's Message *(continued from page 3)*

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