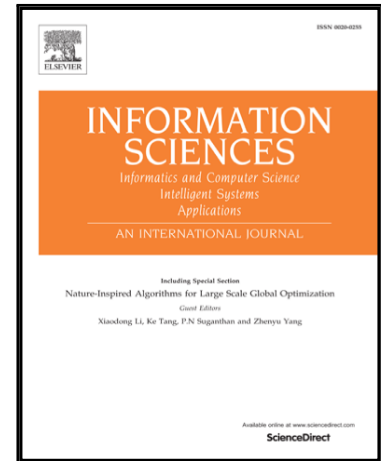


Accepted Manuscript

Multi-Objective Optimization for Modular Granular Neural Networks
applied to Pattern Recognition

Patricia Melin , Daniela Sánchez

PII: S0020-0255(17)30959-3
DOI: [10.1016/j.ins.2017.09.031](https://doi.org/10.1016/j.ins.2017.09.031)
Reference: INS 13135



To appear in: *Information Sciences*

Received date: 31 March 2017
Revised date: 8 September 2017
Accepted date: 10 September 2017

Please cite this article as: Patricia Melin , Daniela Sánchez , Multi-Objective Optimization for Modular Granular Neural Networks applied to Pattern Recognition, *Information Sciences* (2017), doi: [10.1016/j.ins.2017.09.031](https://doi.org/10.1016/j.ins.2017.09.031)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Multi-Objective Optimization for Modular Granular Neural Networks applied to Pattern Recognition

*Patricia Melin, Daniela Sánchez

Tijuana Institute of Technology, Tijuana Mexico

*pmelin@tectijuana.mx, danielasanchez.itt@hotmail.com

Abstract: A new method for Modular Neural Network optimization based on a Multi-objective Hierarchical Genetic Algorithm is proposed in this paper. The modular neural network using a granular approach and its optimization using a multi-objective hierarchical genetic algorithm provides better results than when the modular neural network is applied without a granular approach and optimization of parameters. The optimization of different parameters of the modular granular neural network architecture, such as the number of modules (sub-granules), size of the dataset for the training phase, goal error, learning algorithm, number of hidden layers and their respective number of neurons are performed in the proposed method. The fitness functions aim at minimizing the size of the dataset for the training phase and the error using a multi-objective approach. This method can be used in different areas of application, such as human recognition, classification problems or time series prediction. In this case the proposed method is tested with human recognition based on the face and ear biometric measures, where the proposed method aims at finding non-dominated solutions based on the number of data points for training and the recognition error. Benchmark face and ear databases are used to illustrate the advantages of the proposed approach.

Download English Version:

<https://daneshyari.com/en/article/6856312>

Download Persian Version:

<https://daneshyari.com/article/6856312>

[Daneshyari.com](https://daneshyari.com)