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## Artificial Metaplasticity MultiLayer Perceptrons



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**Abstract:** Metaplasticity concept was defined in 1996 by W.C. Abraham and presently is a biological concept widely known in the fields of biology, medical computer science, neuroscience, physiology, neurology and others. Inspired in it, outstanding improvements have been achieved in artificial neural networks design applied to pattern classification. The proposed training algorithm is inspired by the biological metaplasticity property of neurons and Shannon's information theory. The concept is applicable to Artificial Neural Networks in general, although in this case it is centered on Multilayer Perceptrons (MLP). During the training phase, the Artificial Metaplasticity Multilayer Perceptron (AMMLP) algorithm gives higher values for updating the weights in the less frequent activations than in the more frequent

ones. AMMLP achieves a more efficient training, while improving MLP performance. Tested in standard, well known and easy available Databases, its results are superior to the rest of algorithms, no matter what multidisciplinary application used as case study.

**About the Speaker: Diego Andina** (*Prof. Dr.-Eng, IEEE Senior Member*), was born in Madrid, Spain, where he received simultaneously two Master degrees, on Computer Science and on Electronics&Communications by the Technical University of Madrid (UPM), Spain, in 1990. He achieved the Ph D. degree in 1995 with a thesis on Artificial Neural Networks applications in Signal Processing. He presently works for UPM where he heads the Group for Automation in Signals and Communications (GASC/UPM), a research group interested in Signal Processing and Computational Intelligence Applications: Man-Machine Systems and Cybernetics. He is author or co-author of more than 200 national and international publications, being director of more than 50 R+D projects financed by National and Local Governments, European Commission or private Institutions and Firms. He is also Associate Editorial Member of several International Research Journals and Transactions, and has participated in the organization of more than 50 international Research, Innovation or Technology Transfer events.