Supervising an unsupervised neural network

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Abstract: Machine learning is the field that is dedicated to the design and development of algorithms and techniques that allow computers to "learn". Two common types of learning that are often mentioned are supervised learning and unsupervised learning. One often understands that in supervised learning, the system is given the desired output, and it is required to produce the correct output for the given input, while in unsupervised learning the system is given only the input and the objective is to find the natural structure inherent in the input data. We, however, suggest that even with unsupervised learning, the information inside the input, the structure of the input, and the sequence that the input is given to the system actually make the learning "supervised" in some way. Therefore, we recommend that in order to make the machine learn, even in a "supervised" manner, we should use an "unsupervised learning" model together with an appropriate way of presenting the input. We propose in this paper a simple plasticity neural network model that has the ability of storing information as well as storing the association between a pair of inputs. We then introduce two simple unsupervised learning rules and a framework to supervise our neural network. © 2009 IEEE.
Index Keywords: Design and Development; Input datas; Machine-learning; Natural structures; Neural network model; Unsupervised neural networks; Database systems; Education; Machine design; Neural networks; Supervised learning; Unsupervised learning; Learning algorithms

Year: 2009
Source title: Proceedings - 2009 1st Asian Conference on Intelligent Information and Database Systems, ACIIDS 2009
Art. No.: 5176011
Page : 307-312
Link: Scorpus Link
Correspondence Address: Bui, T. D.; Human Machine Interaction Laboratory, College of Technology, Vietnam National University, Hanoi, Viet Nam
Conference name: 2009 1st Asian Conference on Intelligent Information and Database Systems, ACIIDS 2009
Conference date: 1 April 2009 through 3 April 2009
Conference location: Dong Hoi
Conference code: 78395
ISBN: 9.78E+12
DOI: 10.1109/ACIIDS.2009.92
Language of Original Document: English
Abbreviated Source Title: Proceedings - 2009 1st Asian Conference on Intelligent Information and Database

Systems, ACIIDS 2009
Document Type: Conference Paper
Source: Scopus
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