Artificial Neural Networks (ANNs) are models formulated to mimic the learning capability of human brains. Learning in ANNs can be categorized into supervised, reinforcement and unsupervised learning. Application of supervised ANNs is limited to when the supervisor’s knowledge of the environment is sufficient to supply the networks with labelled datasets. Application of unsupervised ANNs becomes imperative in situations where it is very difficult to get labelled datasets. This paper presents the various methods, and applications of unsupervised ANNs. In order to achieve this, several secondary sources of information, including academic journals and conference proceedings, were selected. Autoencoders, self-organizing maps, and boltzmann machines are some of the unsupervised ANNs based algorithms identified. Some of the areas of application of unsupervised ANNs identified include exploratory data, statistical, biomedical, industrial, financial and control analysis. Unsupervised algorithms have become very useful tools in segmentation of Magnetic resonance images for detection of anomalies in the body systems.
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**Index Terms**

Computer Science
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**Keywords**

Artificial Neural Networks (ANN), unsupervised ANN, Self-Organizing Maps (SOM), Magnetic Resonance Imaging (MRI), clustering, pattern recognition.