Abstract

Cascade-Correlation is a new architecture and supervised learning algorithm for artificial neural networks and classification techniques. Rather than adjusting the weights in a network of predefined topology, Cascade-Correlation begins with a minimal network and it automatically trains, adds new hidden units one after the other by creating a multi-layer structure. As soon as a new hidden unit has been added to the network, its input-side weights are getting fixed. After that these unit then becomes a permanent feature-identifier in the network, present for producing outputs, then cascade-correlation is behaves as more complex feature detectors. The Cascade-Correlation networks have several benefits over existing algorithms as it learns
very fast. It determines its own size and topology fast. It maintains the structures which it has
built even after the training set changes, and it doesn’t need back-propagation of error
signals through the connections of the network and its component. Cascade Correlation Neural
Network (CCNN) types such as recurrent CCNN, evolving CCNN, genetic CCNN are used to
predict software effort from Use Case diagrams in advance manner which helps further for
software cost estimation. The use case diagrams are developed in the early stages of the
software development and they are used for input. This paper is an overview of
cascade-correlation neural networks in which we study different types of cascade-correlation
neural network. They are based on a special architecture which autonomously adapts to the
application and makes the training much more efficient than the widely used backpropagation
algorithm. This review focuses on different types of CCNN and also describes the
cascade-correlation architecture variants.

References

- Kurt Hornik, Maxwell Stinchcombe, and Halbert White. Multilayer Feedforward Networks
- Scott E. Fahlman and Christian Lebiere. The Cascade-Correlation Learning
- Jean-Philippe Thivierge, Fracois Rivest, and Thomas R. Schultz. A Dual-Phase
  Technique for Pruning Constructive Networks. Proceedings of the International Joint
- Steffen Nissen. Large Scale Reinforcement Learning using Q-SARSA and Cascading
- Dale Schuurmans and Finnegan Southey. Metric-Based Methods for Adaptive Model
- Shumeet Baluja and Scott E. Fahlman. Reducing Network Depth in the
- Scott E. Fahlman. The Recurrent Cascade-Correlation Architecture. D. S. Touretzky
- Schetinin, V.: Polynomial neural networks for classifying EEG signals, In: Proceedings of
  NIMIA-SC2001 NATO Advanced Study Institute on Neural Networks for Instrumentation,
- Müller JA, Lemke F. Self-Organizing Data Mining: Extracting Knowledge from Data.
  Trafford Publishing, Canada, 2003
- Thomas R. Schultz, Francois Rivest, L’aszló Egri, Jean-Philippe Thivierge, and
  Fréderic Dandurand. Could Knowledge-based Neural Learning Be Useful in Developmental
  Robotics? The Case of KBCC. International Journal of Humanoid Robotics Vol. 4, No. 2,
  pages 245–279, 2007
- M. Azzeh, D. Neagu and P. Cowling, “Fuzzy grey relational analysis for software


Vitaly Schetinin, "An Evolving Cascade Neural Network Technique for Cleaning Sleep Electroencephalograms," in Computer Science Department, University of Exeter, Exeter, EX4 4QF, UK.

G´abor Bal´azs, "Cascade-Correlation Neural Networks: A Survey," in
Department of Computing Science, University of Alberta, Edmonton, Canada
- Mitchell A. Potter, "A Genetic Cascade-Correlation Learning Algorithm," in Computer Science Department George Mason University Fairfax, VA 22030 USA

Index Terms

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