Comenius University in Bratislava
Faculty of Mathematics, Physics and Informatics

THESIS ASSIGNMENT

Name and Surname:	Bc. Peter Csiba
Study programme:	Computer Science (Single degree study, master II. deg., full time form)
Field of Study:	9.2.1. Computer Science, Informatics
Type of Thesis:	Diploma Thesis
Language of Thesis:	English
Secondary language:	Slovak

Title: Analysis of the generalized recirculation-based learning algorithms in bidirectional neural networks

Aim:
1. Study the literature on general recirculation-based learning algorithms in neural networks and write the state-of-the art of the topic.
2. Implement the GeneRec and BAL learning algorithms and test their properties on selected data sets, using computer simulations and visualization techniques.
3. Consider suitable modifications of the algorithms aimed at improving the network performance.

Literature:
O'Reilly, R.C. (1996). Biologically plausible error-driven learning using local activation differences: The Generalized Recirculation algorithm. Neural Computation, 8, 895-938.
Farkaš I., Rebrová K. (2013). Bidirectional activation-based neural network learning algorithm. In Proceedings of the International Conference on Artificial Neural Networks (ICANN), Springer. 154-161.

Annotation: The advantage of the GeneRec algorithm resides in its biological plausibility, as opposed to the well-known error backpropagation, because it only allows propagation of neuron activations. Recently, a completely bidirectional model BAL has been proposed, inspired by GeneRec, but has not been analyzed in detail (Farkaš and Rebrová, 2013).

Keywords: supervised learning, neural network, classification, heteroassociative mapping

Supervisor:	doc. Ing. Igor Farkaš, PhD.
Department:	FMFI.KAI - Department of Applied Informatics
Head of department:	doc. PhDr. Ján Rybár, PhD.
Assigned:	10.12.2012
Approved:	10.12.2012

prof. RNDr. Branislav Rovan, PhD.
Guarantor of Study Programme

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