

TRAINING OF DEEP NEURAL NETWORKS ON THE BASIS OF DISTRIBUTIONS OF PAIRED SIMILARITY MEASURES

ABSTRACT

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This technical solution generally refers to computing systems based on biological models, and specifically to ways of training deep neural networks based on distributions of the pairwise similarity measures. A way to train deep neural networks based on distributions of pairwise similarity measures, which produces a marked learning sample, where each element of the learning sample has a mark of the class to which it belongs; forms a set of non-crossing random subsets of the learning sample of input data for the deep neural network in such a way that they represent a learning sample when combined; transmits each formed subset of the learning sample to the input of the deep neural network resulting in a deep representation of this subset of the learning sample; determines all pairwise similarity measures between the deep representations of elements of each subset obtained at the previous stage; the similarity measures determined at the previous stage between the elements that have similar marks of classes are referred to the similarity measures of positive pairs, and the similarity measures between the elements that have different marks of classes are referred to the measures of negative pairs; determines the probability distribution of similarity measures for positive pairs and that for negative pairs through the use of histogram; forms the loss function on the basis of probability distributions of similarity measures for positive and negative pairs determined at the previous stage; minimizes the formed function at the previous stage of losses using the BPE technique. The technical result is an improved accuracy of learning and reduced time for setting up the training parameters of deep representation of input data. 1 claim and 10 subclaims, 7 figures.

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(Figure 1)