Distributed Optimization Scheme for Deep Neural Network Weight Tuning

R. Krishnan, Dr. Jagannathan Sarangapani, Dr. V. A. Samaranayake

ABSTRACT
Learning the weights of a deep neural network (DNN) involves optimizing a cost function with respect to all the weights of the DNN. However, this optimization problem is non-convex and presents with challenges such as vanishing gradients, local minima and inefficient learning. In this paper, a novel distributed learning methodology is introduced to address these challenges for the problem of classification. In the proposed approach, layer-wise cost functions are derived with the use of additional variables. Finally, these layer-wise cost functions are optimized to learn the weights. Overall, it is demonstrated in simulation with nine data-sets that the optimization problem is convex and does not suffer from the challenges mentioned before.

*The publication of this abstract is intended for educational purposes only from an internal symposium and its content has not been peer-reviewed.*