Generalized Cross Entropy Loss for Training Deep Neural Networks with Noisy Labels

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1 Summary

It is a proposal for a noise-robust loss function for both the open-set and closed-set dataset. The approach is a generalization of the MAE(Mean Absolute Error) and CCE(Categorical Cross Entropy) using negative Box-Cox transformation. Truncated L_q and L_q losses found to be more noise-robust loss functions.

1.1 Strengths of the proposal

1. The proposed loss function is theoretically grounded and hence should hold true in every condition.
2. Empirically proves that MAE is not suitable for Deep Neural Networks, because of it's slower convergence with challenging data set, despite it's theoretical noise robustness.

1.2 Weaknesses of the proposal

1. Introduced convex L_q loss causes a biconvex optimization problem and takes longer to optimize.
2. The loss function requires us to adjust the values of k and q, which may require a hyper-parameter tuning.
3. Comparisons with multi-class losses from recent research would help us to understand the significance of the paper.

1.3 Results

Theoretically backed truncated loss function was introduced which is robust to noise in challenging multi-class classification.

2 Discussion

2.1 Future Work

How it compares to the recent studies in noise-robust loss functions for multi class data set classifiers.

2.2 Q & A

- What are the performance increase in a binary classification task in open-set data.

3 Reference

[1] https://media.nips.cc/nipsbooks/nipspapers/paper_files/nips31/reviews/5289.html *.NIPS 2-18 Reviews*,