

Stochastic Inference in Bitwise Networks for Cross-Domain Transfer Learning Performance

Assignee Research

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Abstract

This report synthesises findings from 14 peer-reviewed papers addressing the following research question: What is the impact of stochastic inference in bitwise networks on cross-domain transfer learning performance from CIFAR-10 to CIFAR-100, as quantified by accuracy degradation and fine-tuning. 9 claims were extracted from source literature; 0 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 2.8/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Efficient Stochastic Inference of Bitwise Deep Neural Networks. Research question: What is the impact of stochastic inference in bitwise networks on cross-domain transfer learning performance from CIFAR-10 to CIFAR-100, as quantified by accuracy degradation and fine-tuning convergence speed?.

2 Methodology

Systematic literature search across multiple databases yielded 14 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 2.8/10.

3 Results

14 papers retrieved. 9 claims extracted; 0 independently verified. Quality review score: 2.8/10.

4 Limitations

This report is a machine-generated literature synthesis and does not constitute original research. Automated retrieval and verification may introduce errors or omissions. Review scores reflect automated assessment, not human peer review. Readers should consult primary sources for authoritative information.

5 Extracted Claims

Claim	Verified	Confidence
The CIFAR-10 dataset contains 60,000 images in 32×32 pixel RGB resolution and 10 different classes.	×	0.09
The network structure used is 128C3-128C3-MP2-256C3-256C3-MP2-512C3-512C3-MP2-1024FC-1024FC-10SVM4.	×	0.01
The model was trained for 500 epochs with hyperparameters from [4] and without any preprocessing or augmentations on the	×	0.02
The high-precision model parameters with the lowest error on the validation set were used to generate multiple instances	×	0.09
A stochastic BNN ensemble with at least four members always performs better than the floating-point reference model, whi	×	0.07
The best classification error rate achieved with an ensemble of 23 networks was 9.41%.	×	0.09
Better classification results can be achieved when the same network is trained with ReLU activation function, binary pro	×	0.06
The best classification error rate achieved with an ensemble of 29 networks was 5.81%.	×	0.10
The high-precision reference model achieves a classification error of 6.13%.	×	0.08

References

- <http://arxiv.org/abs/2310.04414v3>
- <http://arxiv.org/abs/2308.13515v5>
- <http://arxiv.org/abs/1611.06539v1>