Claude-Pro Performance in Meta-Reasoning: Model Size and Data Diversity Effects

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 model size and training data diversity on Claude-Pro's performance in meta-reasoning tasks as measured by a composite score combining solution accuracy and reasoning quality. 10 claims were extracted from source literature; 2 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 4.5/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Scaling Law Analysis in Federated Learning: How to Select the Optimal Model Size?. Research question: What is the impact of model size and training data diversity on Claude-Pro's performance in meta-reasoning tasks as measured by a composite score combining solution accuracy and reasoning quality across GSM8K, MATH, and Code-HumanEval benchmarks?.

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 4.5/10.

3 Results

14 papers retrieved. 10 claims extracted; 2 independently verified. Quality review score: 4.5/10.

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
Estimating the optimal model size in federated scenarios should depend on the average training compute across clients.	✓	0.35
The correctness of the results is empirically validated with extensive training runs on different models, network settin	×	0.04
Fed-100C accuracy is higher than Fed-50C and Fed-10C.	×	0.02
SingleClient-100C accuracy is higher than SingleClient-50C and SingleClient-10C.	×	0.02
Fed-100C accuracy on ImageNet is higher than Fed-50C and Fed-10C.	×	0.02
SingleClient-100C accuracy on ImageNet is higher than SingleClient-50C and SingleClient-10C.	×	0.01
FT accuracy on CIFAR-100 is higher than Fed-50C and Fed-5C.	×	0.01
SingleClient-50C accuracy on CIFAR-100 is higher than SingleClient-5C.	×	0.02
Stochastic gradient descent (SGD) is a widely used optimization method in machine learning.	×	0.11
The generalization performance of stochastic algorithms can be quantified using a PAC-Bayes upper bound.	✓	0.18

References

- http://arxiv.org/abs/2412.07942v1
- http://arxiv.org/abs/2509.25160v1
- http://arxiv.org/abs/2511.12188v1