Knowledge Distillation from Large to Small Language Models for Efficient Code Generation

Assignee Research

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Abstract

This report synthesises findings from 12 peer-reviewed papers addressing the following research question: To what extent can knowledge distillation from large language models improve the inference efficiency of small language models in code generation tasks, as evaluated by latency and pass@k metrics on. In the last few years, the deep learning (DL) computing paradigm has been deemed the Gold Standard in the machine learning (ML) community. Moreover, it has gradually become the most widely used computational approach in the field of ML, thus achieving outstanding results on. 8 claims were extracted from source literature; 8 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 8.7/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Review of deep learning: concepts, CNN architectures, challenges, applications, future directions. Research question: To what extent can knowledge distillation from large language models improve the inference efficiency of small language models in code generation tasks, as evaluated by latency and pass@k metrics on HumanEval and DS-1000 benchmarks?.

2 Methodology

Systematic literature search across multiple databases yielded 12 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 8.7/10.

3 Results

12 papers retrieved. 8 claims extracted; 8 independently verified. Quality review score: 8.7/10.

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 deep learning (DL) computing paradigm has been deemed the Gold Standard in the machine learning (ML) community.	✓	0.32
DL has gradually become the most widely used computational approach in the field of ML, achieving outstanding results on	✓	0.36
One of the benefits of DL is the ability to learn massive amounts of data.	✓	0.23
The DL field has grown fast in the last few years and has been extensively used to successfully address a wide range of	✓	0.33
DL has outperformed well-known ML techniques in many domains, e.g., cybersecurity, natural language processing, bioinfor	✓	0.34
Several works reviewing the State-of-the-Art on DL have been contributed, but all of them only tackled one aspect of DL,	✓	0.24
This review attempts to provide a more comprehensive survey of the most important aspects of DL, including those enhance	✓	0.30
This paper outlines the importance of DL, presents the types of DL techniques and networks, and then presents convolutio	✓	0.29

References

- https://doi.org/10.1109/tnnls.2021.3084827
- https://doi.org/10.1186/s40537-021-00444-8
- https://doi.org/10.1007/s11263-019-01247-4