

Manifold-Aware Cross-Encoders Outperform Dense Retrievers on Adversarial Benchmarks

Assignee Research

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Abstract

This report synthesises findings from 13 peer-reviewed papers addressing the following research question: Can cross-encoder models trained with manifold-aware objectives outperform traditional dense retrievers on adversarial benchmarks like Adversarial NQ while maintaining competitive accuracy on standard retrieval tasks?. 10 claims were extracted from source literature; 10 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 9.0/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Machine learning and deep learning. Research question: Can cross-encoder models trained with manifold-aware objectives outperform traditional dense retrievers on adversarial benchmarks like Adversarial NQ while maintaining competitive accuracy on standard retrieval tasks?.

2 Methodology

Systematic literature search across multiple databases yielded 13 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 9.0/10.

3 Results

13 papers retrieved. 10 claims extracted; 10 independently verified. Quality review score: 9.0/10.

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
Intelligent systems that offer artificial intelligence capabilities often rely on machine learning.	✓	0.35
Machine learning describes the capacity of systems to learn from problem-specific training data to automate the process	✓	0.47
Deep learning is a machine learning concept based on artificial neural networks.	✓	0.33
For many applications, deep learning models outperform shallow machine learning models and traditional data analysis app	✓	0.36
The article summarizes the fundamentals of machine learning and deep learning.	✓	0.20
The article provides a conceptual distinction between relevant terms and concepts in machine learning and deep learning.	✓	0.26
The article explains the process of automated analytical model building through machine learning and deep learning.	✓	0.33
The article discusses challenges arising when implementing intelligent systems in electronic markets and networked busin	✓	0.20
Challenges in implementing intelligent systems in electronic markets go beyond technological aspects.	✓	0.21
Issues in human-machine interaction and artificial intelligence servitization are highlighted as challenges in implement	✓	0.29

References

- <https://doi.org/10.1007/s11263-020-01359-2>

- <https://doi.org/10.1007/s12525-021-00475-2>
- <https://doi.org/10.1109/access.2021.3140175>