

SOVEREIGN: To what extent does MMICL improve cross-domain generalization in zero-shot retrieval tasks when evaluated on o

SOVEREIGN Research Kernel

Autonomous draft — Owner review required before publication

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Abstract

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 several complex cognitive tasks, matching or even beating those provided by human performance. One of the benefits of DL is the ability to learn massive amounts of data. The DL field has grown fast in the last few years and it has been extensively used to successfully address a wide range of traditional applications. More i

1 Introduction

Analysis of: Review of deep learning: concepts, CNN architectures, challenges, applications, future directions. Research goal: To what extent does MMICL improve cross-domain generalization in zero-shot retrieval tasks when evaluated on out-of-distribution datasets like TextCaps versus in-domain MSCOCO results?.

2 Methodology

Multi-query arXiv search (4 parallel queries, Relevance-sorted). TF-IDF cosine semantic verification (bigrams, threshold=0.15). NIM nv-embedqa-e5-v5 (dim=1024) for semantic indexing. Tribunal v2: 3-role parallel review (SKEPTIC/VALIDATOR/SYNTHESIZER) with revision round if score < 6.5.

3 Results

5 papers retrieved. 7 claims extracted, 6 verified. Tribunal: 7.6/10 \$\rightarrow\$ APPROVE (revision_round=0). Policy: AUTO_APPROVE.

4 Uncertainties

NIM free tier latency varies. TF-IDF verification is a weak signal. arXiv Relevance ranking is query-dependent. Tribunal consensus is LLM-based and prompt-sensitive.

5 Extracted Claims

Claim	Verified	Confidence
Deep learning has gradually become the most widely used computational approach in the field of machine learning.	✓	0.22
Deep learning has achieved outstanding results on several complex cognitive tasks, matching or even beating human perfor	✓	0.20
One of the benefits of deep learning is the ability to learn massive amounts of data.	✓	0.17
Deep learning has outperformed well-known machine learning techniques in domains such as cybersecurity, natural language	✓	0.29
Existing reviews on the State-of-the-Art on deep learning only tackle one aspect of deep learning, leading to an overall	×	0.13
This paper proposes a holistic approach to provide a comprehensive survey of the most important aspects of deep learning	✓	0.18
The paper outlines the importance of deep learning, presents the types of deep learning techniques and networks, and pre	✓	0.22

References

- <https://doi.org/10.1186/s40537-021-00444-8>
- <https://doi.org/10.1145/3560815>
- <https://doi.org/10.1007/s11263-016-0981-7>