

# SOVEREIGN: What is the exact retrieval recall@5 degradation on SQuAD 2.0 when using DPR versus Contriever as context window

SOVEREIGN Research Kernel

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## Abstract

Unlike previous studies on the Metaverse based on Second Life, the current Metaverse is based on the social value of Generation Z that online and offline selves are not different. With the technological development of deep learning-based high-precision recognition models and natural generation models, Metaverse is being strengthened with various factors, from mobile-based always-on access to connectivity with reality using virtual currency. The integration of enhanced social activities and neural-net methods requires a new definition of Metaverse suitable for the present, different from the pr

## 1 Introduction

Analysis of: A Metaverse: Taxonomy, Components, Applications, and Open Challenges. Research goal: What is the exact retrieval recall@5 degradation on SQuAD 2.0 when using DPR versus Contriever as context window size is reduced from 4096 to 1024 tokens?.

## 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

9 papers retrieved. 7 claims extracted, 6 verified. Tribunal: 7.5/10  $\rightarrow$  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
The current Metaverse is based on the social value of Generation Z that online and offline selves are not different	✓	0.29
Previous studies on the Metaverse were based on Second Life	✓	0.24
The current Metaverse is based on the social value of Generation Z that online and offline selves are not different	✓	0.29
Deep learning-based high-precision recognition models and natural generation models are being used to strengthen the Met	✓	0.24
The paper divides the concepts and essential techniques for realizing the Metaverse into three components (hardware, software)	✓	0.37
Mobile-based always-on access is a factor strengthening the Metaverse	×	0.11
The paper analyzes three representative Metaverse examples: Ready Player One, Roblox, and Facebook in the domain of film	✓	0.20

## References

- <https://doi.org/10.18653/v1/d19-1514>
- <https://doi.org/10.18653/v1/p19-1139>
- <https://doi.org/10.1109/access.2021.3140175>