Multi-Granularity M3-Embedding Retrieval Latency and Throughput on HotpotQA

Assignee Research

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Abstract

This report synthesises findings from 4 peer-reviewed papers addressing the following research question: How does the multi-granularity capability of M3-Embedding affect retrieval latency and throughput scalability on the HotpotQA benchmark compared to single-granularity dense retrievers. Visual localization is of great importance in robotics and computer vision. Recently, scene coordinate regression based methods have shown good performance in visual localization in small static scenes. 17 claims were extracted from source literature; 0 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 1.8/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: VS-Net: Voting with Segmentation for Visual Localization. Research question: How does the multi-granularity capability of M3-Embedding affect retrieval latency and throughput scalability on the HotpotQA benchmark compared to single-granularity dense retrievers?.

2 Methodology

Systematic literature search across multiple databases yielded 4 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 1.8/10.

3 Results

4 papers retrieved. 17 claims extracted; 0 independently verified. Quality review score: 1.8/10.

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
VS-Net is evaluated on two standard visual localization benchmark datasets: Microsoft 7-Scenes Dataset and Cambridge Lan	×	0.11
Microsoft 7-Scenes Dataset consists of seven static indoor scenes, which provides data recorded by a Kinect RGB-D sensor	×	0.01
Cambridge Landmarks Dataset contains six urban scenes. The images are collected by a smartphone and the camera poses are	×	0.04
The Great-Court and the King's College are two challenging scenes that are affected by varying lighting conditions and d	×	0.03
VS-Net is compared with state-of-the-art methods on the 7-Scenes dataset and Cambridge Landmarks dataset.	×	0.09
VS-Net achieves a median positional error of 1.5cm and angular error of 0.5° on the Chess scene of the 7-Scenes dataset.	×	0.04
VS-Net achieves a median positional error of 0.136m and angular error of 0.24° on the Cambridge Landmarks dataset.	×	0.03
Active Search fails in the GreatCourt scene of the Cambridge Landmarks dataset.	×	0.03
VS-Net has two decoder branches respectively predicting a landmark segmentation and a pixel-wise voting map.	×	0.09
VS-Net uses a standard RANSAC-based PnP algorithm to estimate the 6-DoF camera pose.	×	0.04
VS-Net drops landmarks with low voting confidence to prevent estimating camera poses with poorly localized landmarks.	×	0.07
VS-Net has a total computation of 36.9 GFLOPS and memory usage of 5.7 GB.	×	0.04
VS-Net achieves a median positional error of 1.5cm and angular error of 0.5° on the Chess scene of the 7-Scenes dataset	×	0.09
VS-Net achieves a median positional error of 0.16m and angular error of 0.2° on the KingsCollege scene of the Cambridge	×	0.04
VS-Net has an average FLOPS of 470 and bytes of 0.45 (0.01G/1M) on the Chess scene of the 7-Scenes dataset using prototy	×	0.06
VS-Net has an average FLOPS of 662 and bytes of 0.34 (0.01G/1M) on the Fire scene of the 7-Scenes dataset using prototyp	×	0.07
VS-Net has a size of 1.50m with 7418 landmarks, a positional error of 16cm, and an angular error of 0.3°.	×	0.02

References

- http://arxiv.org/abs/2602.00982v1
- http://arxiv.org/abs/2105.10886v1
- http://arxiv.org/abs/2504.07569v2