MemoriEase at the NTCIR-17 Lifelog-5 Task

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Introduction

- MemoriEase is a lifelog retrieval system participated in NTCIR-17 Lifelog-5 task.
- MemoriEase is an automatic system, inheriting from the predecessor version in Lifelog Search Challenge 2023 [1].
- Vector search with open-sourced Elasticsearch.
- New enhancement in using LLM to rewrite query and post-processing.

Methodology

- A dataset of 18-month lifelog with over 725k images, from January 2019 to June 2020.
- Blur image removal by edge weight computation.
- Metadata extraction, enhancement and cleaning.
- BLIP-2 is used to extract the embedding of images and query to compute the cosine similarity.
- Elasticsearch uses K-nearest neighbor search to find relevant images from query.
- GPT-3.5-turbo is used to write paraphrased queries from the original query and search parallelly.
- Weighted average for retrieve results.

Result

<table>
<thead>
<tr>
<th>Metric</th>
<th>Precision @5</th>
<th>Precision @10</th>
<th>Precision @15</th>
<th>Precision @20</th>
<th>Precision @30</th>
<th>Precision @100</th>
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<tbody>
<tr>
<td>MAP</td>
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<td>0.3707</td>
<td>0.3219</td>
<td>0.2878</td>
<td>0.2621</td>
<td>0.2496</td>
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<td>GM_MAP</td>
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<tr>
<td>Rprec</td>
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<tr>
<td>Recip Rank</td>
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</tbody>
</table>

Table 1: MemoriEase performance on various metrics

Table 2: MemoriEase precision at different cutoffs

- 651 submitted images are correct in the total of 4100 submitted images, accounting for 15.88%.
- The performance of MemoriEase on Lifelog-5 task is 0.2713 MAP and 0.6197 Recip Rank.
- Precision at 5 is 0.3707, indicating a good performance at top 5 retrieved results.

Conclusion

- Introduce the automatic manner of MemoriEase to take part in the NTCIR-17 Lifelog-5 Task.
- New processing technique in LLM for query rewriting.
- Achieve a P@5 at 37.07% and P@100 at 15.88%.