MemoriEase at the NTCIR-17 Lifelog-5 Task

Quang-Linh Tran
ADAPT Centre, School of Computing
Dublin City University
Dublin 9, Ireland

Binh T. Nguyen
AISIA Lab
University of Science
Ho Chi Minh City, Vietnam

Gareth J. F. Jones, Cathal Gurrin
ADAPT Centre, School of Computing
Dublin City University
Dublin 9, Ireland

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].
- MemoriEase employs an embedding-based search with state-of-the-art BLIP-2 [2] multi-modal model.
- Vector search with open-sourced Elasticsearch.
- New enhancement in using LLM to rewrite query and post-processing.

Result

MAP	0.2713
GM_MAP	0.0283
Bpref	0
Rprec	0.29
Recip Rank	0.6197

Table 1: MemoriEase performance on various metrics

Cutoff	Precision
@5	0.3707
@10	0.3219
@15	0.2878
@20	0.2621
@30	0.2496
@100	0.1588

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.

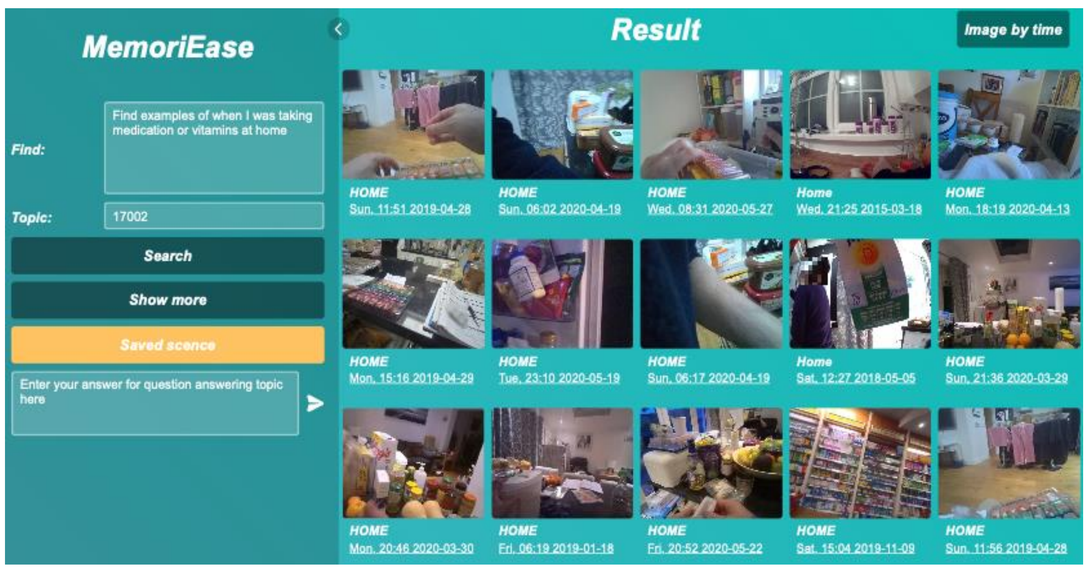

Figure 3: MemoriEase's interface for searching query 17002

Methodology

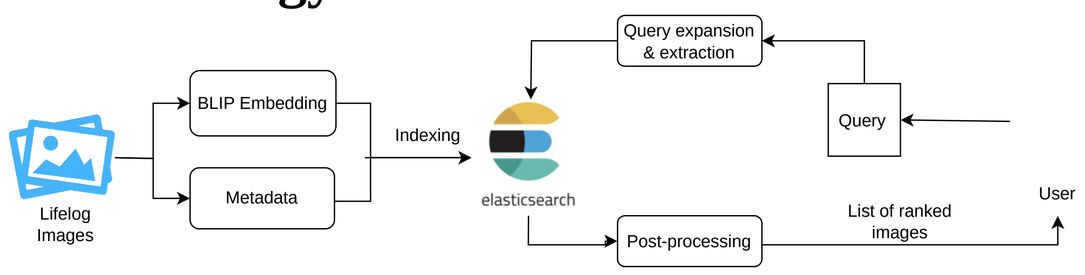

Figure 1: MemoriEase overview

- 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.

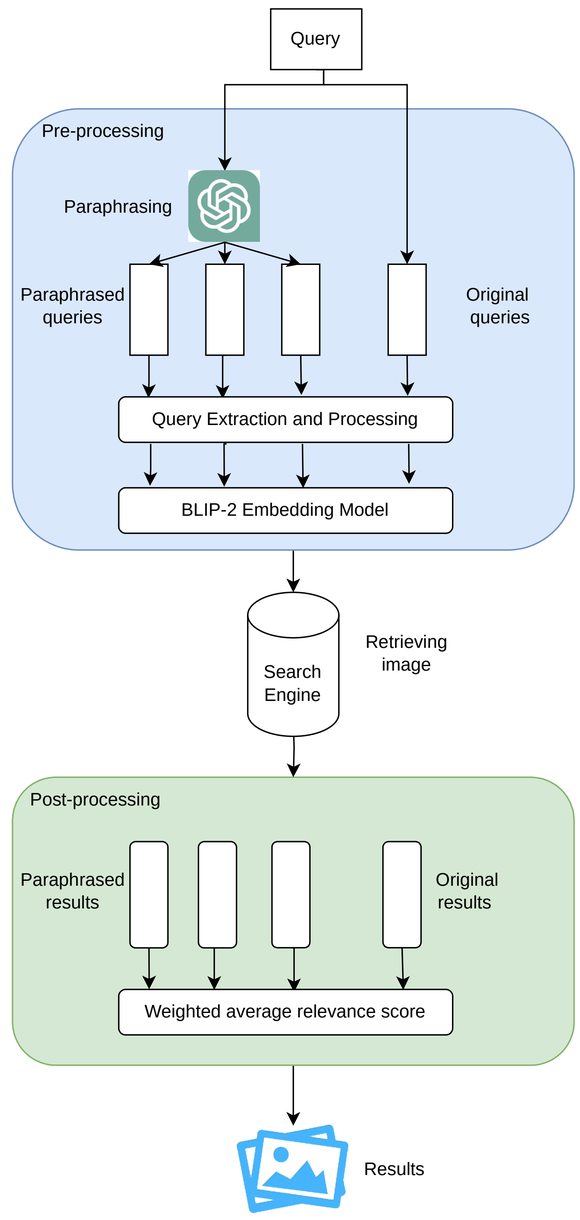

Figure 2: New processing steps

- 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.

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%.

[1] *Quang-Linh Tran, Ly-Duyen Tran, Binh Nguyen, and Cathal Gurrin. 2023. MemoriEase: An Interactive Lifelog Retrieval System for LSC'23. In Proceedings of the 6th Annual ACM Lifelog Search Challenge (LSC '23). Association for Computing Machinery, New York, NY, USA, 30–35.*
[2] *Junnan Li, Dongxu Li, Silvio Savarese, and Steven Hoi. 2023. Blip-2: Bootstrapping language-image pre-training with frozen image encoders and large language models.*