# Introduction to the Sixth Annual Lifelog Search Challenge, LSC'23


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## ABSTRACT

For the sixth time since 2018, the Lifelog Search Challenge (LSC) was organized as a comparative benchmarking exercise for various interactive lifelog search systems. The goal of this international competition is to test system capabilities to access large multimodal lifelogs. LSC'23 attracted twelve participanting teams, each of whom had developed a competitive interactive lifelog retrieval system. The benchmark was organized in front of live audience at the LSC workshop at ACM ICMR'23. As in previous editions, this introductory paper presents the LSC workshop and introduces the participating lifelog search systems.



## CCS CONCEPTS

• **Human-centered computing** → *Empirical studies in interaction design*; • **Information systems** → **Mobile information processing systems**; **Search interfaces**.

## KEYWORDS

Lifelog, Interactive Retrieval Systems, Benchmarking

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## 1 INTRODUCTION

Organising and searching through large multimodal lifelogs has been an active research topic since the introduction of MyLifeBits [3]. In recent years, activities such as the Lifelog Search Challenge [5] and the NTCIR-lifelog task [4] have brought together members of the research community to develop and comparatively benchmark novel approaches to lifelog search and retrieval.

LSC was founded in 2018 as a comparative benchmarking workshop to foster efficient and effective information retrieval technologies, by providing participants with a large multimodal lifelog dataset and related information needs. Competing teams must locate relevant content as rapidly as possible in a live, interactive challenge at the annual ACM ICMR conference. In this paper, we introduce LSC'23, the sixth iteration of the Lifelog Search Challenge, which took place in June at ACM ICMR'23 in Thessaloniki, Greece.



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## 2 LSC'23 WORKSHOP CONFIGURATION

LSC'23 reused the complete 18-month multimodal dataset gathered by one lifelogger that was also used in LSC'22 [6]. The dataset contained over 725,000 fully-redacted and wearer-screened PoV wearable camera images in $1024 \times 768$ resolution. Each image was accompanied by minute-by-minute metadata, such as music listening history, biometrics, and semantic locations, all aligned with UTC time. Additionally, the Microsoft Computer Vision API[1] was used to extract visual metadata and OCR text from each image.

The competition consisted of 24 realistic tasks, where participating teams observed textual task descriptions and submitted potentially matching items to the evaluation server. There were three different types of task topics: ad-hoc/conventional topics; single/few known item topics; and Q&A-type topics. While one (or more) relevant image(s) were sufficient for both ad-hoc and known-item topics, the Q&A topics required the submission of a textual answer to the query. Both ad-hoc and Q&A-type topics were evaluated by judges in real-time. The evaluation system 'DRES' [12] was used to manage the challenge and provide the judging/scoring interface. A score for each topic was given by a formula combining both time and precision into one overall rating, which was averaged over all topics during the competition. The results of the challenge identified the best-performing expert, novice, and overall systems.

## 3 LSC'23 PARTICIPATING SYSTEMS

Twelve research teams developing interactive lifelog search engines participated in the LSC'23 challenge. One overall observation is

[1] https://azure.microsoft.com/en-us/services/cognitive-services/computer-vision

that almost all teams employed text-image embedding models in their retrieval systems as core functionality.

Eight systems can be considered to be enhanced versions of existing systems. MyEachtra [16] is an enhanced version of the top-performing MyScéal system from LSC'20-22 [17] that integrates an enhanced embedding model and event-centric retrieval. lifeXplore [14] was updated for this edition to integrate image-text embedding models with temporal context filtering, as well as traditional CNN and object-based retrieval for situations in which the embedding model fails. The revised MEMORIA system [11] utilises a free-text graph database with more detailed image annotations and event segmentation to enhance the user experience. Memento [1] now integrates user-selectable embedding models with a cluster-based search technique to increase search efficiency, as well as a revised UI to facilitate multiple different types of queries. E-LifeSeeker [9] integrates the latest embedding models for retrieval and utilises differential networks to support Q&A queries. LifeGraph 3 [13] is the successor to previous LifeGraph systems and integrates a multi-modal knowledge graph based on cluster hierarchies built upon temporal, spatial, and visual clusters to enable interactive navigation and exploration. Voxento 4.0 [2] integrates the latest embedding models and utilises a larger set of voice commands and enhanced user interface to support a more efficient user experience. Finally, FIRST [7] introduces generative models to enhance or expand a user's query and integrates temporal event segmentation to enhance the user interface.

There were also a number of new systems introduced for LSC'23. Spiess et. al [15] introduce a novel desktop-virtual reality hybrid system which is based on the vitrivr stack and utilises a web-based desktop UI for querying and a VR-based interface for result exploration. MemoriEase [18] combines concept-based and embedding-based retrieval approaches with an intuitive user interface. LifeInsight [10] supports an embedding model-based retrieval system, but also provides a novel spacial insight mechanism to assist with Q&A type queries. Finally, built on the underlying E-LifeSeeker retrieval engine, LifeLens [8] focuses on the user experience and presents a minimalist user interface design, specifically designed for lifelogs, which prioritises a simple user-focused experience.

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