LSC2018 Panel - Challenges of Lifelog Search And Access

Duc-Tien Dang-Nguyen
Dublin City University
Ireland
duc-tien.dang-nguyen@dcu.ie

Klaus Schoeffmann
Klagenfurt University
Austria
ks@itec.aau.at

Wolfgang Hurst
Utrecht University
Netherlands
huerst@uu.nl

ABSTRACT

Lifelogging is becoming an increasingly important topic of research and this paper highlights the thoughts of the three panelists at the LSC - Lifelog Search Challenge at ICMR 2018 in Yokohama, Japan on June 11, 2018. The thoughts cover important topics such as the need for challenges in multimedia access, the need for a better user interface and the challenges in building datasets and organising benchmarking activities such as the LSC.

CCS CONCEPTS

• **Information systems → Retrieval effectiveness**;

KEYWORDS

Lifelogging, collaborative benchmaarking, datasets, personal data

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1 INTRODUCTION

Lifelogging is becoming an increasingly important topic of research and this paper highlights the thoughts of the three panelists at the LSC - Lifelog Search Challenge at ICMR 2018 in Yokohama, Japan on June 11, 2018. The members of the panel were:

- Klaus Schoeffmann, Klagenfurt University. Klaus is the founder of the Video Browser Showdown.
- Duc-Tien Dang-Nguyen, Dublin City University. Duc-Tien is a lifelog and data governance researcher who co-organises many of the lifelog benchmarking activities.
- Wolfgang Hurst, Utrecht University. Wolfgang is a HCI researcher who has been leading the effort in developing VR-based interfaces to information systems.

The panel was chaired by Cathal Gurrin (Dublin City University), who was one of the organisers of the LSC workshop at ICMR2018. The panel covered many important topics in the field, such as the need for exercises such as the LSC, the challenges of organising them and the need for better consideration of the user when developing such information systems.

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2 THE NEED FOR MULTIMEDIA SEARCH CHALLENGES

There are several ways of evaluating the performance of multimedia retrieval tools: user simulations, user studies, and live evaluation campaigns – also known as search challenges. User simulations are rather easy to conduct but have the drawback that they do not consider the individuality of human users (such as the context, background, knowledge, etc.) [12]. User simulations assume that all users will interact similarly and therefore are not well suited for evaluating interactive search tools that rely heavily on the user [11]. User studies, on the other hand, can consider such specifics of individuals, but are often hard to reproduce, since every study can be influenced by variations in users, tasks, and sometimes datasets. Due to these reasons user studies are also not optimal for evaluating several different multimedia retrieval tools against each other. Live evaluation campaigns, such as the Video Browser Showdown [10] and the Lifelog Search Challenge target exactly that problem: evaluating many different video search tools for the purpose of interactive search through large multimedia archives in a fair and comparative setting. Here, all teams perform retrieval task at the same time on the same dataset, for the same tasks in the same room (i.e., same setup and conditions). The performance of each team is evaluated live by an on-site evaluation server, which further increases the pressure on each participating team and makes the challenge quite competitive. This fact pushes the participants to their limits: they try to be better than the others and heavily optimize their search tools. The experience from many years of the VBS [9] has shown that the tools participating in the challenge become significantly better with each iteration.

3 CONSIDERATIONS ON BUILDING A COMMON DATASET

Lifeloggers need applications or services to discover insights from their personal life archive, which require knowledge extraction, search, summarisation, and visualisation. In order to validate these tools, we need data, including large and rich collections of lifelog data. Moreover, we need to compare the performance of these tools together. Thus, there is a strong need to have a common published dataset for studies in this field [6]. To the best of our knowledge, there are very few published dataset in this field (for example the NTCIR-12 [5] and its related version in ImageCLEFlifelog 2017 [7], and there is no common dataset of such kind of data released out of the context of a research challenge or task. The design and construction of such a common published lifelog dataset is also not trivial, where there are significant technical challenges to be solved, arising from the gathering, semantic enrichment, and pervasive accessing of these vast personal data archives [5]. A discussion of

these challenges can be seen in [2], which can be summarized as a number of challenges.

Contributors. People are beginning to log their lives via mobile applications, taking photos of their food, recording there activities, etc.. However, the prevalence of gathering personal data and the willingness of individuals to share this data is not the same thing. Finding volunteers willing to share rich lifelog archives with the community is one of the major challenges to be solved.

Determine the contents of the dataset. A lifelog typically consists of numerous different types of data, from what lifeloggers see, hear, sense, do, and so on. Ideally, we should log all information from all sources, which is called total capture. However, it is non-trivial since capturing everything from every moment is not feasible in practice[2]. Therefore, making a decision on what to log is indeed a non trivial task and is limited to the suite of readily available devices and software. Moreover, lifelog data shows considerable variance in terms of capture velocity and variety. In order to be useful for the individual, lifelogging needs content organisation and retrieval facilities that operate over data at different velocities and frequencies.

Privacy and Data Security, which has implications for both the individual and society as a whole [4]. Personally identifiable information should be kept private[2], which requires considerable effort for data anonymisation while allowing for data analytics methods operate effectively on the data. This also requires a well designed strategy to control data access post-release.

4 THE NEED FOR BETTER INTERFACES

Lifelogs are, as the name suggests, a representation of your past life, or at least parts thereof. They can be used to automatically extract important information, such as advice on how to live healthier based on eating and exercising habits. Likewise, people can actively access them; be it in search for a particular information, to refresh their memory, or to just randomly browse and "relive" parts of their past. In both cases, we are faced with a tremendous, overwhelming amount of data. When we look at the second use case, the active access to lifelog data, research has made tremendous advances to support this; for example, computer vision allows us to analyze the content of photos, machine learning algorithms can relate different sensor data, identify parts of particular interest, and filter out less relevant information. Yet, in addition to such work on the intelligent analysis of lifelogs, we also need to think about how to design the interfaces that allow humans to access, manage, and process it. Even if we solely focus on photos taken with a lifelogging camera, the data is different than traditional photos, as are often the intentions with which such a photo archive is used and accessed, thus requiring new solutions in interaction design.

To answer the question "What is an ideal interface for accessing lifelog data?", we first need to know why and how people want to access their lifelogs. This can be situations that require a very targeted search (e.g., "What was the name of the restaurant where I went with my friend when visiting him in Dublin last summer?"), vague information needs asking for a more exploratory search (e.g., "What were nice restaurants that I went to on my various trips to Dublin?"), or scenarios where people just want to randomly browse the data (e.g., "lets see what kind of cool stuff I did last year."). Once we have a better understanding of the intended usage, we need to design interfaces that are optimized for them. For targeted search, easy filtering and querying techniques are needed building on the various successful projects to analyze lifelog data. For more vague, exploratory search needs, the uniqueness of lifelog data requires us to think about new, innovative ways to visualize and interactively explore them. Researchers are now applying information visualization techniques to lifelog data, including data captured automatically by smartphones [8] and lifelog images [1], but these approaches focus more on passive representation and often lack in possibilities for interactive exploration. An interesting new development is this context is the usage of new platforms for access, such as Virtual and Augmented Reality [3]. While Virtual Reality representations can benefit from the larger and more immersive screen offered by head-mounted VR displays, Augmented Reality provides interesting opportunities for location-related access due to its combination of virtual and real world objects.

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