Reflection on Reflection: Daily Review of Lifelog Photos and the Usability of Wearable Digital Camera

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Reflection on Reflection:
Daily Review of Lifelog Photos
and the Usability of Wearable Digital Camera

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Abstract. The novel activity of continuous visual lifelogging, becoming more and more affordable with small, wearable digital cameras, allows a user to visually record a day's activities in remarkable details and review or re-live later. Loaded with privacy and ethical issues but still promising so many potentially positive usage scenarios, such an extreme lifelogging has many aspects to be further explored to become a truly meaningful, usable and life quality-enhancing activity. Based on the authors' first-hand experiences of practicing visual lifelogging for a number of years, this paper describes the usability issues of wearing a typical lifelog digital camera and reviewing the photos each day.

Keywords: lifelogging, daily reflection, wearable camera.

1 Introduction

While the field of HCI is mainly concerned about improving people's lives and interaction with technologies by understanding their activities and trying to support those activities with available or developing technologies, sometimes the process takes a reverse turn whereby an available or developing technology ends up inventing a new activity that hitherto people have not practiced (thus have not voiced their wish to practice it) before. A number of novel activities as a result of such a process are expected to pour out over the coming years as the new technological advancements in terms of computational algorithms and interaction platforms are fiercely explored, experimented and exploited into end-user systems, gadgets and services. The concept of "lifelogging" is an example of such a novel activity, and is about to become a more prevalent and common practice as more convenient means to "log" one's life is becoming available and the idea of frequent tracking and recording of one's whereabouts as evidenced in the increasing membership of Quantified Self[1] is becoming more prevalent. One extreme type of lifelogging is to use a passive digital camera to visually record the details of one's life in minute details throughout the days, and such an activity is likewise becoming more and more acceptable as more compact

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[1] Quantified Self: Self Knowledge through Numbers. `http://quantifiedself.com/`

and smaller wearable photo capture devices become available in the market and as the community of avid bloggers/tweeters find the value in these capture devices to passively record their daily lives. Many novel usage scenarios of such a visual and continuous lifelogging activities are currently being investigated in different domains, including a memory aid for Alzheimer patients or memory-impaired people (Harrell 2010), discovering one's lifestyle (Doherty et al. 2011), diagnosing the heart rate irregularity among the elderly (Mohan et al. 2012) and as market research tool (Hughes et al. 2012).

Currently there are no long-term "visual lifeloggers" with photo capture devices other than a minority of dedicated researchers who actually practice the lifelogging activity in order to gain insights and obtain real data from such a practice. Awaiting more convenient wearable digital camera products and more usable and useful software applications to help organise, search, review and relive the daily amassed data, in this paper we describe the authors' experience of practicing the continuous visual lifelogging for over the past 6 years, in terms of the usability of wearing a passive capture device and in terms of reviewing the photos daily.

2   Wearability of the Passive Capture Camera

According to Heckel's Law (Derrett 2004) stating that "the quality of the user interface of an appliance is relatively unimportant in determining its adoption by users if the perceived value of the appliance is high," the enormous potential value of the lifelogging activity will likely push the prevalence of such activities in the coming years as the general public starts experimenting and finding the values in their own terms, even if the wearability, usability and other practicalities of practicing the lifelogging activity is not yet at the level where one can conveniently and effortlessly engage in today. However, as better, more convenient, lighter, smaller, more consumer-friendly wearable digital cameras are starting to be marketed and software supporting the access to the collected photos are improved, there certainly will be more uptake of the lifelogging by the general public.

Practicing a photo-based lifelogging activity today means a considerable commitment in terms of wearing the device on a continuous basis. Current form of a wearable digital camera such as SenseCam and Vicon Revue[2] is a light-weight mini black box with a strap to hang around a user's neck, so that the device itself can dangle in front of the users chest. This causes a number of inconveniences and hindrances in day-to-day activities. For example, when the user walks very fast or runs (e.g. to catch a bus, or going up the stairs quickly), the device around the neck moves like a pendulum often hitting the chest or other nearby walls/objects. When running, one ends up holding the device pressed to the chest in order to avoid such a movement. Those activities that involve the person to bend down can cause similar issues, for example, washing the face,

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[2] Vicon Revue: Memories for Life: `http://viconrevue.com`

eating, shoe-lacing and picking up something from the ground. Minor inconveniences as these will be felt differently to different people due to many different factors. Other more recent wearable camera products such as Autographer[3] and Memoto[4] allow the user to clip the device on the collar or chest pocket, avoiding the dangling inconveniences of their predecessors.

Other usability issues of wearing the device worth noting include:

- Going outdoor in the winter time usually means wearing coat or jacket, in which case the user should re-adjust or re-wear the device accordingly;
- As the device is not water-proof, the user needs to take a particular care on a rainy day outdoor or in the bathroom when washing hands or face;
- Whenever the user comes to privacy/security-sensitive areas such as toilet, gym and airport security points, the device has to be taken off and turned off;
- The user needs to be always mindful about any obstacles that might block the camera lens on the device, for example, when using a seat belt in a car, care should be taken that the belt strap does not cover the device lens;

Improving the form factor of the device itself would be half the solution as some of these are outside of the issues of the product itself. Lighter and smaller hardware that will not pull down the clothes when clipped on the chest, water-proof, an easily re-clippable or re-adjustable mechanism, and appropriate privacy and ethical instruments and policies need to be developed to enhance the wearability issues felt today.

3   Daily Review and Reflection

One obvious usage scenario for lifelogging without requiring much additional infrastructure or support is a simple daily review of what happened during the day, by the camera wearer going through all the captured photos in the evening. Reviewing what happened during the day, what the wearer did, where she was, whom she met, what she ate, etc. at the end of each day can be a very beneficial and rewarding activity allowing a self-reflection similar to keeping a personal diary but in a visual and far more detailed way, and in a far more consistently-captured throughout the day than a diary-keeping could allow.

Currently the software tools that support the daily review of the photos taken by wearable digital camera are those simply presenting all the photos of the day sequentially one by one, as in a slide-show. The number of photos generated by wearing the device on a typical day is between 3,000 and 4,000 depending on the kinds of activities the wearer was engaged in throughout the day, thus going through this amount of photos everyday takes time and requires considerable effort, concentration and patience. Better photo-browsing software specifically tailored for handling and presenting a large number of photos is needed. Use of

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[3] OMG Life Autographer: `http://www.autographer.com/`
[4] Memoto Lifelogging Camera: `http://memoto.com/`

computer vision and image understanding techniques to automatically index, annotate and summarise/highlight the large amount of accumulating lifelog photo collection is one of the directions the computational technology community has been exploring over the past few years. Automatically identifying people, places and other objects that appear in the photos and preparing a concise and summarised user-interface (Lee et al. 2008) will help the user more efficiently and conveniently browse the daily lifelog photos over time.

Many small and big events that happen during each day are, by the natural process of forgetfulness, completely forgotten. Furthermore, during the events that happen we focus on things that are at hand, thus unable to notice many of the other aspects of the events that unfold at the time of engagement. For example, when a person is engaged in a conversation with a colleague in the office corridor, she is usually too busy with the conversation to notice other passer-by, new signs beside the door, clothes the colleague is wearing, or any other things that happen or are around at that time. Reviewing that event later allows her to view these other aspects that might be useful or even important in the way that would have been otherwise impossible.

Extending the daily reflection, one could imagine reviewing of a whole year at the end of the year - what has she done this year, what were the important events and what other aspects of those events can she notice when she reviews? Again, facilitating for indexing, annotation and highlighting of the important activities, unusual events or memorable incidents that happened throughout a year will be a powerful end-user support tool for browsing, re-living and reflecting one's life on a longer-term basis.

4   Conclusion

Shaping future activities afforded by emerging technological possibilities is a significant and potentially high-impact effort that could transform how we work and play in a major way in the coming years, but many aspects of these shaping can be better understood only after the early adopters start practicing the activity and go through exciting but expensive, cumbersome and inefficient trial-and-error processes. Awaiting for a more prevalent use of wearable digital cameras as a personal daily reflection tool, as a memory aid for the elderly, as an educational and training tool, or as a lifestyle monitoring tool in medicine, we need to go one step ahead by actually practicing the lifelogging activity and identifying and analysing important usability issues of such a tool and suggest how we could enhance the quality of such a potentially useful activity before it happens on a massive scale in the coming years.

References

Derrett, N.: Heckel's law: conclusions from the user interface design of a music appliance - the bassoon. Personal Ubiquitous Comput. 8, 3–4 (2004)

Doherty, A., Caprani, N., O Conaire, C., Kalnikaite, V., Gurrin, C., Smeaton, A.F., O'Connor, N.: Passively recognising human activities through lifelogging. Computers in Human Behavior 27(5), 1948–1958 (2011)

Harrell, E.: Remains of the day: can a new device help amnesia patients outsource memory? Time Magazine, 46–51 (October 2010)

Hughes, M., Newman, E., O'Hare, N., Zhang, Z., Lee, H., Smeaton, A.F., O'Connor, N., Farrell, G.A.: Lifelogging approach to automated market research. In: SenseCam 2012 - 3rd Annual SenseCam Symposium, Oxford, U.K., April 3-4 (2012)

Lee, H., Smeaton, A.F., O'Connor, N., Jones, G., Blighe, M., Byrne, D., Doherty, A., Gurrin, C.: Constructing a SenseCam visual diary as a media process. Multimedia Systems Journal 14(6), 341–349 (2008)

Mohan, E.R., Lee, H., Jaichandar, K.S., Calderon, C.: LifeVision: Integrating heart rate sensing in lifelogging camera for accurate risk diagnosis for the elderly. In: The 6th Intl. Convention on Rehabilitation Eng. and Assistive Tech. (2012)