# A Quantified Past: Remembering with Personal Informatics

**Chris Elsden**

School of Computer Science

Culture Lab

Newcastle University, UK

c.r.elsden@newcastle.ac.uk

**David Kirk**

School of Computer Science

Culture Lab

Newcastle University, UK

david.kirk@newcastle.ac.uk

## Abstract

This paper questions how we will interact with our 'Quantified Past', the historical record created by our daily use of personal informatics tools.  Bringing together HCI research on memory and personal informatics, we introduce an ongoing user-study and several speculations for the long-term design and use of personal informatics tools.

## Author Keywords

Remembering; Personal Informatics; Quantified Self; Time; Experience;

## ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

## Introduction

As our digital footprint grows, through lives lived increasingly online, HCI researchers have considered 'The Future of Looking Back' [1]. Rather than simply augmenting human memory, this considers the role digital technologies will play in mediating the lifelong experience of remembering. If we are to focus on the experience, then we view remembering as a situated, present-oriented process of reconstruction. This demands a more social and cultural minded study of memory, and a departure from some purely cognitivist
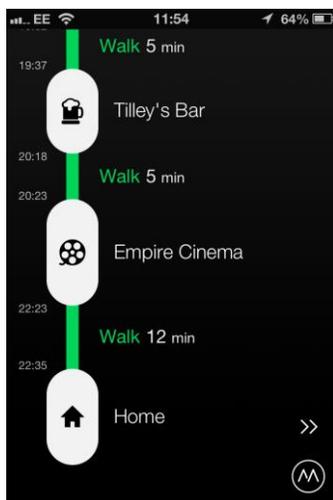
Figure 1: Screenshots of the popular physical activity tracking smartphone app Moves (www.moves-app.com).

perspectives. As Harper [2] suggests, as designers we should consider how memory is used as *'a-resource-for-action'* rather than merely *'something-in-the-head'*.

With this in mind, recent research in HCI has moved beyond concepts of 'total capture' [11], to consider the many practices surrounding the long term value of digital possessions. Studies of experiences with physical mementos [8], the use of the web as an archive [6], concepts of digital inheritance [7], reflections on social media histories [10] and numerous studies of Microsoft's wearable automatic camera SenseCam are indicative of the growing interest in this area.

Much of this previous work addresses digital media that are traditionally evocative, and often designed with memory in mind; however, our primary contention is that we're now collecting all sorts of other data through which the past could be interestingly encountered.  The proliferation of powerful sensors in smartphones and wearable devices have made available a class of 'personal informatics' tools [3] making it easier than ever to record the more routine details of our everyday lives. Popular metrics to track include physical activity (e.g. Figure 1), sleep, diet, spending habits, mood and health status.

The vanguard for this trend is the Quantified Self (QS) movement, which holds regular meet-ups in over 100 cities worldwide. Banks' work [1] briefly considers the long-term lives of his Nike+ and Last.fm accounts (tracking running and music listening), and highlights QS evangelist Nicholas Felton's annual 'Feltron report' (feltron.com).  However, beyond such enthusiasts, Rooksby et al. [9] have argued that 'lived informatics' are increasingly '*enmeshed with everyday life'*.

Personal Informatics has enjoyed considerable academic attention in recent years - including three CHI workshops (e.g. [5]). However, Rooksby et al. [9] have noted that this research tends to be 'technology-centric', focusing on behaviour change, rather than the more everyday *experience* and *usage* of existing tools.

Our contention is that a move towards 'lived informatics' should also consider the long term value and the future use of data produced by these tools. Looking back on current and past informatics data is a potentially rich and diverse *emotional* experience, which is perhaps overlooked within the characterisation of a highly rational human seeking 'self-knowledge through numbers'. While Li et al. [4] have described in detail how people reflect on their data produced through personal informatics tools, they exclude the documentary use of these tools, and focus exclusively on reflection as part of behaviour change, rather than as an end in itself.

In summary, we propose that whilst you might track your run today, to try to run faster tomorrow, interacting with that data in ten years is a different experience entirely. Therefore, this work-in-progress seeks to explore how to design for longer term use, and consider how remembering a digital 'Quantified Past' differs from nostalgic experiences with other media.

### A Quantified Past
To understand what this quantified past might look like, we can readily find different examples of the everyday use of personal informatics tools and the records they are creating. Our ongoing study (see side panel) seeks to unpick how and why they are initially produced and explore people's experiences with developing archives.

**Work-in-Progress**

**Participants:** This ongoing study firstly interviews up to 20 people about historic personal informatics data. The study covers many different types of data, but in each case, their data is at least 6 months old.

**Interviews:** Interviews lasting around 30 minutes consist of two parts. Firstly, participants are asked to look back on some of their data with the researcher, and in a very open ended way describe what the data is about, what it means to them and what they remember. They are then asked more general questions about how they look back upon the data.

**Analysis:** The interviews are transcribed and analysed from a phenomenological perspective to investigate the remembering and sense-making experiences.

**Design:** The interviews are the first exploration of this design space, which will inform various design provocations to speculate with participants.

For some in the study, self-tracking is achieved passively (e.g. wearing an activity tracker such as a 'Fitbit'), whilst for others it requires active user input (e.g. adding daily food intake with MyFitnessPal.com). They often do this to improve behaviour as Li et al. [3] suggest, although for some it is also to keep track of a health concern or simply out of curiosity. Recording can occur routinely in the background or specifically to capture important events in detail. Whether there is an initial intention to document one's life or not, in the long term, the proliferation of these tools and 'Big Data' suggest that a life log will be achieved largely as a by-product of simply living one's life.

What follows is a series of speculative questions to be explored by our Work-in-Progress. This will provide a foundation for design work to speculate on what a quantified past could look like, how it might mediate the *experience of remembering*, and the role designers can play to shape that future. The speculations below are not hypotheses or predictions, but highlight areas of interest to spark discussion and further research.

## Emerging Speculations / Critical Issues
### Encounters
Collected and stored across devices for disparate purposes, the first question is how and when will we encounter and engage with these fragments of the past? Wright and McCarthy [12] suggest we consider composition of an experience, including its narrative structure. Might people set aside time to nostalgically browse their data, perhaps chronologically like a photo album? Will we seek out just a particular instance that is of interest, or might this data turn up, out of context, unexpectedly, like an old email in a keyword search?

### Objectiveness
Personal informatics tools are frequently proposed to be objective, and data is often presented factually. How do people engage with this objectiveness in reflection? If the data contrasts with how they subjectively remember the activity, can the data be flexibly interpreted? If not, how can they resolve that tension?

### Errors
Much of Li et al.'s work has highlighted the many barriers and difficulties in accurately self-tracking [3]. How will errors be viewed looking back? Can minor errors (e.g GPS inaccuracies) be overlooked and the data largely trusted or will it be entirely devalued?

### Gaps in the data
People do not track all the time; devices can fail; data can be lost; people forget to record. How will people perceive and interpret these gaps? With regret or suspicion? How are they explained or compensated for?

### Granularity
A quantified past might be visualised in many different ways at different levels of granularity. Averages and trends show behaviour over a period of one's life; specific events can be depicted in fine detail. Putting aside the privacy issues of high granularity, when do people value each of these perspectives in retrospect?

### Evolving meaning
Rooksby et al. [9] report that people use many different informatics tools for particular present-focused motivations, with few considering their long-term use. However many of these tools capture a range of data and what is interesting or valuable about it might change considerably over time. For example, you might

## Participant Quotes

*"But that kind of tells you more about your life than you perhaps would have thought that it would"* – Joanne, 24, reflecting on her 'MyFitnessPal' app.

*"I do feel like I need to keep it. I don't feel like I could just get rid of it. Because I do feel like that is a piece of work that I've done."* - David, 24, describing his use of money tracking apps over 3 years.

*"I think for specific events, like being ill, or moving house then it would be kind of interesting to look back, and see how much you remember, or how that aligns with what you think happened that day or how different it actually recorded what, what you know happened."* – Jess, 35, on the smartphone activity tracker 'Moves'.

use the app Moves (Figure 1) to record your step count, trying to keep healthy. However, years later it might be the location data on the maps it creates which are most evocative. Is there any way we can design for this evolution of meaning within the data?

*Personal Informatics as a form of metadata*
While presently much self-tracking is achieved with stand-alone apps or devices, they are increasingly connected to provide a greater context. However, would it be meaningful to combine this data with other sorts of digital media such as photos or calendars, perhaps as a further form of metadata?

*Sharing informatics*
Although self-tracking is often a personal and private activity, would people choose to share historic personal informatics data? How would it compare to show one's kids detailed running data from your youth as opposed to a photo in the running team? And how could the data mediate storytelling and the accounts we make of ourselves to others? Likewise might we make sense of data other than our own? That of family members, ancestors, strangers or employees?

These are just some of the many speculations that arise out of the intersection of remembering with digital technologies and the rise of personal informatics. Our Work-in-Progress seeks to open up a space to answer these and provoke designers to reflect upon the long-term use and value of the data these tools create.

## Acknowledgements

## References
1. Banks, R. *The future of looking back*.  O'Reilly Media, Inc., 2011
2. Harper, R., Randall, D., Smyth, N. et al. The past is a different place: they do things differently there. In *Proc. DIS 2008*, ACM, 271–280
3. Li, I. et al. A stage-based model of personal informatics systems. In *Proc. CHI 2010*, ACM 557–566
4. Li, I., Forlizzi, J., and Dey, A. Know thyself: monitoring and reflecting on facets of one's life. In *Proc. CHI 2010 Ext. Abs,* ACM, 4489–4492
5. Li, I., Froehlich, J., et al.Personal informatics in the wild: hacking habits for health & happiness. In *Proc. CHI 2013 Ext. Abs.* ACM, 3179–3182
6. Lindley, S. Rethinking the Web as a Personal Archive. In *Proc. WWW 2013*
7. Odom, W. et al. Technology heirlooms?: considerations for passing down and inheriting digital materials. In *Proc. CHI 2012*, ACM, 337–346
8. Petrelli, D., Whittaker, S., and Brockmeier, J. AutoTopography: what can physical mementos tell us about digital memories? In *Proc. CHI 2008*, ACM, 53–62
9. Rooksby, J., Rost, M., Morrison, A., et al. Personal Tracking as Lived Informatics. To appear in *Proc. CHI 2014*, ACM.
10. Schwanda Sosik, V., Zhao, X., and Cosley, D. See friendship, sort of: How conversation and digital traces might support reflection on friendships. In *Proc. CSCW 2012,* ACM, 1145–1154
11. Sellen, A.J. and Whittaker, S. Beyond total capture: a constructive critique of lifelogging. *Communications of the ACM,* 53, 5 (2010), 70–77
12. Wright, P. and McCarthy, J. *Technology as experience*. MIT Press, 2004.