Experiencing SenseCam: A Case Study Interview Exploring Seven Years Living with a Wearable Camera

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ABSTRACT

This paper presents the findings from an interview with CG, an individual who has worn an automated camera, the SenseCam, every day for the past seven years. Of interest to the study were the participant's day-to-day experiences wearing the camera and whether these had changed since first wearing the camera. The findings presented outline the effect that wearing the camera has on his self-identity, relationships and interactions with people in the public. Issues relating to data capture, transfer and retrieval of lifelog images are also identified. These experiences inform us of the long-term effects of digital life capture and how lifelogging could progress in the future.

Author Keywords

Wearable cameras; lifelogging; lead user; interview study.

ACM Classification Keywords

H.1.2 Information systems: User/Machine Systems

INTRODUCTION

The history of wearable computing and lifelogging can be fundamentally attributed to visionary computer scientist Steve Mann, a professor in the University of Toronto. It is Mann's belief that in the future, people will not only interact with computers, but that computers will become part of the person. Since the 1990s, much of his research has concentrated on miniaturizing wearable computing technology, much of which can capture visual lifelogs. He is currently developing a skull cap with implantable and surface electrodes to aid the blind to see, as well as an artificial eye implant, with a built in digital camera [16]. It was after an experiment, conducted between 1994 and 1996, in which Mann streamed live video from a wearable camera to and from the Web, that the concept 'lifelogging' was born. In contrast to 'surveillance' technologies, which refer to visual monitoring from above, Mann coined the term 'sousveillance', to describe the recording of activity from the perspective of the participant, typically by way of

small wearable or portable devices. Lifelogging is one form of sousveillance.

Mann's life streaming project inspired people to 'lifecast', recording their lives through fixed and/or portable cameras and making the footage available to the public through the Internet, such as Justin.tv. Social networking site Facebook has recently acknowledged the value of their users' content by introducing a timeline layout, created from user's postings, videos and photos (https://www.facebook.com/about/timeline). FaceBook's Timeline was created by manual lifelogger, Nick Felton, who spent years reporting and charting his personal activities [4].

In contrast to lifecasting, lifelogging is considered to be the capture of personal experiences for personal use. The technologies to capture a visual narrative of one's life have so far been one of the key challenges for lifelogging research [2]. Researchers in Microsoft Research decided to go beyond the capture of visual data, by exploring extreme lifelogging, or in other words, trying to record everything an individual experiences. Inspired by Vannevar Bush's hypothetical Memex device [as cited in 9], computer scientist Gordon Bell endeavoured to collect a lifetime of personal content, which included documents, email, photos, music, conversations, and Web sites visited. The project, entitled MyLifeBits, aimed to develop searchable and secure personal archive software.

One of the devices that Gordon Bell used to record his experiences is the SenseCam, developed by Microsoft Research in Cambridge, U.K [11]. The SenseCam is a small digital camera that is designed to automatically take photographs without any user intervention (see Figure 1 for example images).

The SenseCam was the first viable wearable camera used in lifelogging research. It has been in use (either as the SenseCam or the Vicon Revue) for almost a decade. In 2013, we note the development of a new set of visual lifelogging devices, such as the Memoto wearable camera and the Vicon Autographer, both of which operate as wearable cameras in a manner similar to the original SenseCam. It is also likely that 2013 will see the introduction of a new generation of lifelogging device based on point-of-view visual capture of life experience.

Figure 1: Example images captured using a SenseCam device.

Technologies such as Google Glass (currently in widespread beta use) and similar Android-based camera enabled wearable devices that incorporate a head-mounted camera/display offer potential to evolve into head-mounted lifelogging devices.

This paper presents an individual's experiences of wearing the SenseCam (or Vicon Revue) over the past seven years, to-date capturing over 12 million images. This individual, who is co-author of this paper and referred to as CG throughout, could be considered a "lead user" of wearable cameras. In contrast to early adopters of technology, "lead users" such as Mann, Bell, CG and Felton, explore the needs for, and potential of products and services that don't yet exist on the market [21]. Von Hippel states that lead users have two specific characteristics: (1) they are at the leading edge of important market trends, and (2) they have a strong incentive to find solutions for the novel needs they encounter at the leading edge. The experiences of lead users are essential for the successful development and adoption of emerging products, such as wearable cameras to capture lifelog data. The case study interview presented in this paper explores these experiences, needs and potential solutions.

METHOD

Participant Details

CG is a 38-year old male, born and living in Ireland. He works as a lecturer and researcher in a university. CG began lifelogging in November 2005, collecting location data using a GPS logger. In 2006, CG wore the SenseCam to collect visual data for a two-week period whilst on a trip to Norway. These targets increased in their ambition with CG aiming to collect one million images, then to wear the SenseCam for one year, then two years and so on. One of the initial motivations behind CG wearing the camera was to allow the research centre where CG works to use the data to understand how to manage and organize large data sets. Data set generation was, and continues to be, a limiting factor in developing new search and organization tools for visual lifelogging research. Therefore, throughout the first three years of wearing the camera CG was aware that his images may be viewed by his colleagues.

CG wears the SenseCam every day, from morning until night. At home, where CG lives alone, the camera is only turned or taken off when CG is asleep, showering or getting dressed. In public places, he only turns or takes the camera off if he is specifically asked or if he is in an environment where the device is not allowed, for example going through security in an airport. As part of his occupation, CG travels abroad approximately 15-20 times per year. Socially, CG meets with friends and family, in both public environments, such as restaurants, and also private home environments.

Currently, CG collects not only SenseCam data but also location, activity, weight & diet data. He also captures screenshots from his laptop and smartphone to record his interaction with these devices, posts to social networking sites and digitally stores any personal communication.

SenseCam: Automated Wearable Camera

The SenseCam is an automated camera worn around the neck via a lanyard, sitting at chest height (see figure 2). The device's image capture is triggered by changes in the wearer's environment through embedded sensors monitoring light-intensity and light-color, temperature, movement and passive infrared. In addition, an internal timer automatically triggers image capture every 30 seconds. A fish-eye lens maximizes the field of view so that images display almost everything within the wearer's field of vision. The device itself is black in color with dimensions of 6.5cm (w) x 7.0cm (h) x 1.7cm (d). There are three buttons which include a power button, a privacy button (which temporarily stops image capture), and an image capture button (which either disables the privacy button or forces an image to be recorded). There are three small lights at the top of the device; a green light to indicate the device is switched on, an orange light to indicate sensor readings, and a red light to indicate that the privacy function has been activated.

In 2009 the device was commercialized and rebranded as Vicon Revue. The Vicon Revue and subsequenty the Vicon Autographer (due for release in 2013) are both based on SenseCam-inspired technology, developed by Microsoft. The advantage of the Autographer is that it offers GPS functionality, it is smaller and slimmer and more visually

Figure 2: SenseCam automated wearable camera

appealing than the SenseCam, and it can be clipped onto clothing, increasing its "wearability". Since its development, CG has replaced the Vicon Revue with the Autographer in mid-2013.

The software to upload, store and review SenseCam images has also evolved over the past seven years. Initially Microsoft provided software that provided an animation/movie style payback mechanism whereby the life activities of any given day can be played back as a fast-paced animation. The Vicon Revue provided similar software, though with a key-frame browser for browsing through daily image sequences. Other access interfaces have been developed such as Doherty and Smeaton's [7] first generation WWW interface that implements event segmentation to detect sequential events during a day, detect the importance of each event, represent each with a chosen key-image, and link between events. Other interaction methodologies have been developed such as the TV Browser [10], MyLifeBits [9] and Shareday [22].

Interview Design
A semi-structured interview was carried out with the participant CG. The interview was audio recorded, lasting two hours and ten minutes. A note-taker was also present throughout the interview session.

The interview was structured beginning with questions relating to CG's personal details and lifestyle. This was followed by a series of questions concerning the use of the camera, the images and the effect that the camera has on tasks, behaviors and interacting with other people. Following this, CG was asked to discuss his experience wearing the camera for the first time in 2006 and what changes he has experienced over time. Finally, CG was asked to provide any predictions or solutions to the progression of lifelogging in the future.

The audio recording was transcribed and analyzed. Although CG is named as an author on this paper, he was not involved in any part of the interview design or analysis. The key findings are discussed in the following section.

FINDINGS AND DISCUSSION
Several themes were identified from the interview with CG relating to his experiences and beliefs concerning lifelog technology. These themes include (1) data capture and access to the data, (2) identity, (3) relationships, (4) public interaction, and (5) the dichotomy between ideal capture and current societal expectations.

Data Capture and Access

Data Capture
The SenseCam automatically captures visual data throughout a normal 16-18 hour day for CG. Interaction is necessary to turn on and off the camera, and optional if the wearer wants to manually trigger image capture, or to position the camera for a better view point. It was found

that CG's initial experience of wearing the camera was quite different from how he currently uses the camera. CG has always put the camera on in the morning and worn it throughout the day. However, he reported that during the first few weeks of wearing the camera he *"did more interesting things"*. He told us that he was more social, but then life took over and he quickly fell back into his usual routine. This was similar for reviewing his images, where in the first week he looked at his images every day. This gradually lessened over the weeks and now CG claims to only review his images if he experienced a significant event.

"I would never look over them on a normal day. And even if I go travelling somewhere I wouldn't look over them, unless I think it's significant, for personal reasons".

It came across clearly throughout the interview that wearing the camera is an inherent part of his daily routine, and quickly became so; he likens it to wearing a watch. Once on, he does not interact with it, or rarely even notices it. At the beginning of the interview I pointed out to CG that he was not wearing the Autographer. This was because it was attached to his suit jacket which was hung on the back of his chair. This was an example of how little impact wearing the camera has on how he performs day to day activities. He is not concerned with capturing the perfect image. As he explained himself, *"if you have to interact with it you lose the whole point of it"*. The point that CG is referring to is that the purpose of the camera is to capture your life and your experiences. If you are interacting with the camera, this has an effect on your experiences, interrupting them in some way. CG points out that about 4% of the images are good quality, interesting images. At this time, the camera was the Autographer which can be clipped onto clothing. However, CG explained to us that even wearing the SenseCam on a lanyard, which is not in a fixed position, did not inhibit him from doing tasks:

"If it gets broken, it gets broken but I'm using it all the time. I don't treat it as being a precious item"

It is inevitable in life that we will have both good and bad experiences, or be a part of other people's experiences. We were interested in CG's use of the camera in these situations. His response was that he does not differentiate between sad or happy events when it comes to wearing the camera: *"Your life can't be made up of happy times. I don't see the difference between happy or sad at all; it's all part of your data and your life experience. It all goes into your diary if you're writing a diary…it's a life story"*. However, when discussing other people's experiences, CG told us that he sometimes does take off the camera depending on the situation, for example at a funeral or a wedding, he suggests that there is an issue of appropriateness.

As mentioned previously, it is not only the SenseCam that CG uses to capture his life story. With current technology

there is a high cost on time and effort to remember to log events, (such as checking-in to locations or recording food consumption), to transfer data for storage and to search and retrieve data. According to CG, it is worth this effort in the short term, to understand how lifelogging can improve: *"I will only stop wearing the SenseCam when I move onto a better device".* He states that next generation devices have to be point-of-view, at eye-level, context aware, automatic upload with real-time feedback. It is expected that upcoming devices such as Google's Glass will support applications and services that meet these criteria.

Data Transfer for Storage
Images need to be transferred from the SenseCam to a computer or laptop when the device reaches maximum capacity. For CG who continuously wears the SenseCam throughout the day, this transfer is conducted every few days. When the device is uploading images to a computer, it cannot record images. In order to maximize the time spent capturing images, CG has developed a routine to transfer his images at night when he would be taking the camera off anyway, which allows it to recharge. When a few weeks data is collected on this laptop, CG transfers his images to a main storage system. One of the problems that can be experienced when transferring images from the camera to a computer, is deletion of the images if the connection between devices is lost. CG has experienced this on more than one occasion with the new devices he is using and relates his feeling of loss and frustration, particularly if it was a significant event. With automatic and real-time upload to the cloud, these difficulties could be avoided in the future.

Image Retrieval
It is expected that once lifelog images are recorded that we can then enjoy viewing them and sharing them with people. When he first began lifelogging, with a small data set, this is what CG did with his images; manually creating life stories and sometimes video logs. Now with a collection of twelve million, searching and accessing images has become impossible. Although software is available to upload and browse this data, images are organized by date and time, which is not optimal search criteria [13]. CG emphasizes the need for software to be designed to allow for search, recommendation, and quantified analysis for example. Without this software CG cannot benefit from his archive. He is collecting them so that in the future, when this software is available, he can use his vast image archive to review significant and interesting events, validate his own memory of events, reminisce and share his images and experiences. He is working to develop this software.

With thousands of images automatically recorded every day, it is likely that unwanted images are also recorded, such as in the bathroom. These images are also part of our lives, however, CG points out that although he is personally unconcerned about the images, since the archive is private,

it is possible that other people will view his images, for example children who might inherit them. Currently CG only deletes unwanted images if he comes across them, as searching for them would take too much time. This means that there could still be hundreds of experiences that he would prefer other people not to see. Developing software that could identify and automatically hide or delete such events could resolve this problem [8]. CG believes that his lifelog would not be of much interest to people after his death, that they are only interesting to him because it is his life and they are meaningful to him. This response echoes previous research which looked at people's current practices for collecting. These participants also believed that their children or relations would have no interest in their personal mementos because they would not understand the emotional attachment [5]. However, CG believes that should future generations inherit a lifelog, it is up to the individual to decide whether they want their children to see their actual life and experiences, or to curate the images, supporting the memories that the children have of how this person lived. CG suggests that the lifelog offers the only real-trace of the person, which may be different from the view/opinion that others have of CG. Lifelog images can have strong associations with a person's identity, which we will discuss in the next section.

Identity: The SenseCam is me
Visual lifelog collections are inherently personal representations of a person's life. Like physical mementos, they can hold significant meaning for one person, associating it with an experience or a person, while having no meaning to another person. If we add audio and video recordings to these lifelogs, they may provide more detail for a third party to understand the events, but without the *story* behind the event they will not have much meaning. Lifelogs are meaningful to the person who captured these images because they represent their life and their experiences. To CG, these images are a more accurate version of a person than their understanding of themselves.

"It captures you…an accurate version of you. The camera is you: everywhere you've been, everything you have done, everybody you've spoken to, everything you have eaten. The camera has a trace of you…a record of you, the memory of you, whereas you own version is error prone and subjective."

The participant expects that when he grows old, with declining memory abilities, eventually this data will become his memory, a ready source to remind and support him. This belief is not unfounded. Berry et al. [3] paved the way for lifelogging and memory research in her pioneering study investigating whether reviewing SenseCam images improved autobiographical memory in a patient with severe memory impairment. Comparing the SenseCam recordings of experienced events to a written diary and baseline condition, Berry found that reviewing SenseCam images significantly improved recall compared to the other

conditions. Similar findings were found in a subsequent study which showed the benefit of rehearsal to support the formation of personal semantic (knowledge-based) memory in children who have distinct memory difficulties [20].

Being a lead user of lifelog technology means wearing technology that is unknown to the general public. In an article about his experience Mann [17] says that wearing his computerized eyewear marks him out as a nerd. Similarly, CG believes that people in the public consider him to be a "freak" for wearing a camera. However, to CG wearing a camera and lifelogging is not a strange activity. He has been doing it for seven years. This is a perception of his identity that he is prepared to accept, believing that wearable cameras will soon become ubiquitous.

On two occasions throughout the interview with CG, he referred to Ray Kerzweil, an inventor and entrepreneur renowned for his predictions about the evolution of technology and how it develops exponentially. In his book "The Age of Spiritual Machines" Kerzweil [12] predicted that by the year 2009, personal computers with high-resolution visual displays will come in a range of sizes, from those small enough to be embedded in clothing and jewelry, up to the size of a thin book. By the year 2019, Kerzweil predicts that computers will be largely invisible, embedded everywhere, such as in walls, tables, clothing and bodies. He believes that three-dimensional virtual reality displays, embedded in glasses and contact lenses will be used routinely as primary interfaces for communication with other persons, computers and the Web. By 2029, permanent or removable implants for the eyes, as well as cochlear implants will be used to provide input and output between the human user and the worldwide computer network. Eventually there will no longer be a clear distinction between humans and computers, according to Kerzweil.

This is the future that CG envisions for lifelogging. That lifelog technology will eventually merge with the human, with images being transferred directly to our retina and stored in our body, where they can be accessed in real-time. The designers of Google Glass, and Steve Mann before them, identified the importance of point-of-view capture; tracking what a person is looking at when their head is turned away from their body, and also what their attention lingers on. So already we are seeing capture technology being designed to wear at eye level, and embedded into clothing accessories. However, if companies such as Google succeed in popularizing lifelog eye-wear, it is important that they consider the long-term effects, such as eye-strain which may occur from viewing the asymmetrical display, through only one eye [17]. The effect of embedding technology in our bodies on *self-identity* should also be monitored carefully. There could be two sides to this argument. The first being that an augmented human, who has the capability to record fine-grained detail of their experiences, has a superior understanding of activities,

behaviors and therefore self-identity. On the other hand, one could argue that as technology merges with the human, we begin to lose our sense of self. Rather than technology being used as a tool to support a task, it has become part of us and part of our identity.

Relationships

Respect

A person wearing an automated camera does not appear in any of the images captured, unless in the mirror. Rather, it is the people, places, and activities that the wearer encounters that are the main characters. We were interested in how people whom CG spends his time with most (e.g. family, friends and colleagues) behave or react to him wearing the camera and capturing images of them. CG's response was that people don't mention the camera to him, apart from when he first began to wear it, or when he changed over to the Autographer. CG believes that people who he sees regularly simply don't notice it anymore, and he does not notice a change in their behavior: *"friends and family, absolutely not. People who are used to it, not at all"*. He also finds it rare for people to ask for a copy of his images if he captures a shared event *"I don't offer so it's just if people ask and I've only been asked a handful of times"*. However, CG predicts that this might change when images are automatically uploaded to a smart phone, which will make them easier to view and share in the moment. With the advent of new devices such as Memoto, Autographer and Glass (as a lifelogging tool), then such sharing could become commonplace.

CG was reluctant to use the word "respect" when discussing lifelogging, however he could not find a suitable alternative. His reluctance was because he believes he is not disrespectful by wearing a camera to capture his experiences. He noted that when he is taking part in somebody else's event, experience or visiting their home it is important to judge the situation, and whether wearing a camera is appropriate. For example, he would turn the camera off if he visited a friend's house and they were getting their children ready for bed, or if he was part of a wedding ceremony he would not wear it because it would affect the couple's wedding photographs. CG does note that his brother-in-law wanted to wear his SenseCam during his wedding ceremony, though his sister did object.

Although it came across in the interview that CG was firm on his lifelog being his personal archive, he was aware that these images not only portray his life, but also people whom he shares his life with. Previously, it was mentioned that CG may delete images that are unwanted *and* don't have any particular value to him. This is also true for images of people captured by the SenseCam that they would be unhappy to see or not want other people to see:

"You don't want somebody to be annoyed because there is something in the lifelog that captured them in a way they

don't want to be seen by other people. And inevitably that happens".

Acceptance

To CG, lifelogging is a hobby, a serious interest, a lifestyle choice and a work-related research project. In other words, it covers all parts of his life, both public and personal. In the previous section, we noted that CG was willing to accept being categorized as unusual by people in the public domain, confident that they too will be wearing lifelog technology in the near future. In his private life, CG has experienced both good and bad effects of wearing the camera:

"In terms of relationships…it always causes friction. Well not always, it depends of the person. You get people who don't want any pictures of them and you get people who want loads of pictures because they think they're beautiful".

Like a hobby, CG considers lifelogging to be part of his identity and should be accepted as that:

"It sounds terrible but I will choose a relationship on the basis of whether someone is accepting of that or not".

When considering this CG suggests that it is because lifelogging is a part of his life, just like someone may have a passion for marathon running or cooking Chinese cuisine. CG equates lifelogging with any other lifestyle activity.

Trust

Within social relationships trust is an essential to a lifelogger, such as CG. Friends, family and partners need to trust that the person wearing a recording device will not share images of them without their permission, or publish them to the Web. Unlike posed photographs taken manually, lifelog images capture spontaneous, natural images that can capture a person at their best, but they can also capture unflattering images of people, for example taking a bite from a burger, or watching the television in their pajamas. In fact CG suggests that lifelog pictures capture the essence of the person, not a staged representation.

A lifelogger also has to have trust in the people close to him or her, that they will respect the privacy of a lifelog collection: *"It's completely unacceptable to read somebody's diary but it's not considered as unacceptable, as far as I can see, to request to look at somebody's lifelog".*

In the interview it was found that CG experienced the negative side of this: *"This collection breaks down trust".* In an insecure relationship, having a record of where you were, who you were with and what you did, means that trusting that what a person says is true, and giving people the benefit of the doubt is no longer the only option.

"When the data is there you don't have the same level of trust in a person, because there is always an accurate record".

CG is also concerned about issues when an ex-partner may decide to use the collection against him, by demanding access, assurances, deletion, etc. He puts this down to being a lead user, and the new scenarios that creates.

Public Interaction

The SenseCam, and the Autographer and Memoto following it, are designed to be conspicuous, and specifically not like a 'hidden' camera. The SenseCam displays small lights on the top of the camera, which flicker on and off when images are captured, or readings are recorded through the on-board sensors. The Autographer is designed with a very obvious lens on the front, highlighted by a yellow ring around it. The point being that when worn, these devices are not hidden from public view. Inevitably people will be curious about a device that they have not encountered before. When questioned about this, CG told us that although people might notice the camera, he is rarely asked about it. Since first wearing the camera he has noticed that gradually the public are recognizing the technology more, particularly since media coverage of the SenseCam on popular shows on television. The concept of lifelogging has also become more widespread since Google presented Project Glass (www.google.com/glass).

However, the SenseCam is still relatively unknown and people may not be aware that it is a camera that is recording them. CG told us that for the most part he forgets he is wearing the camera, because it does not have any impact on his tasks and people he encounters regularly do not seem to notice any more. Surprisingly, CG reported that he feels just as self-conscious now in public places when interacting with strangers, as he did when he first wore the camera seven years ago, although this is not to a degree where he would prefer not to wear it. It appears that this awareness of the camera when in the company of strangers is a defensive response. The participant told us that he has become quite good at reading people and the situation he is in. His response when asked about the camera is dependent on whether he believes a person is genuinely curious and interested in the camera, or whether they will have a negative attitude and be a possible threat to his safety. Although very rare, when feeling threatened he avoids confrontation by telling the person that the camera is not for recording at that time. For the most part, CG tells us that he simply takes the camera off is someone requests him to or he thinks that they feel uncomfortable. He believes that if he could explain fully the concept of lifelogging, or show the type of images that are captured, on a display screen, that they would feel more comfortable being within the cameras viewpoint. This is an effect of using products that are not available yet on the market and being a lead user. A more widespread acceptance and awareness of lifelogging will make such interactions easier.

Digital lifelogging is a relatively new concept and it is only through lead users wearing lifelog devices and experiencing the problems and benefits of them that we can understand how lifelogging should progress in the future. One issue is privacy: *"privacy and lifelogging are inherently at odds with each other".* Cavoukian [6] stresses the importance of "Privacy by Design", which seeks to proactively embed privacy into the design of technology from the early stages, rather than being an after-thought. Lifelogging would benefit from designer and developers considering the different aspects of privacy, for both the person who is lifelogging and also third parties who may be recorded.

We asked CG what his experiences were with people in the public, whether he informed people that he was wearing a camera or whether he asked their permission. His response was that he only tells people he is wearing a camera if they ask him. He was also asked about his opinion on people's right to privacy…

"Do I have concerns about other people's privacy who are in my data? Of course I do, I can't ignore that…but it's impossible to ask everybody".

CG admitted that he is not an expert on privacy. He is interested in collecting images from his life to understand the potential of these large data archives. Privacy issues around lifelogging have been explored by the experts in these fields [1, 15, 19]. Massimi et al. [18] found that most people expect and tolerate being recorded by surveillance devices in public places, however consent is expected in private settings. Mann [16] acknowledges that privacy concerns and regulations related to sousveillance, being a new concept, have yet to be worked out and, like our participant CG, he argues that it would be impractical to obtain consent from every individual one passes when life recording. Instead he suggests pointing concerned participants towards a Request for Deletion (RFD) form [15]. This topic deserves further study in terms of lifelogging practices. Pointing people towards a RFD form, as Mann suggests, most likely would not be received positively by the person demanding the deletion of images. However, unless a clear set of guidelines are established, it is necessary that lifeloggers use their own judgement in relation to third party concerns.

Ideal capture and societal expectations
Contradictions were noted between the participant's attitude to situations and his actual behavior, or the behavior he reported. These appear to be a dichotomy between CG's lifelogging ideal and his actual behavior based on current societal expectations and technology restrictions.

There were three examples of this throughout the interview. Firstly, CG said that the main point of lifelogging is that it is automatic: your experiences are not interrupted if you want to take a photograph of an event. The ideal is that the technology does all the work, while you can continue to interact with the world around you. Currently the technology is not sophisticated enough to allow this, and recording, transferring, storage and image retrieval carry a large burden on time and effort.

Secondly, CG reported that it is impossible to ask people for permission to wear an automated camera, but is aware of their concerns. He believes that as lifelogging becomes more ubiquitous these concerns will disappear, as they did with camera phones. However, when asked about his experiences, CG appeared to be acutely aware of a stranger's response to the camera, and he continuously uses his judgment of a situation to decide whether or not it is appropriate to wear the camera.

Lastly, it is CG's belief that lifelog data collected are an *"accurate version of you",* where a person's organic memory is flawed. However like all data, lifelogs can be manipulated. Even CG who strives to record as much detail as possible, deletes certain images, if he thinks that deletion is necessary. He also noted that it is possible to change the meta-data of an image if someone wanted to.

These examples highlight the participant's vision for lifelogging, being pure (i.e. un-manipulated), ubiquitous, beneficial to individuals and accepted by society.

CONCLUSION
This paper presents the experiences of a person who has worn an automated digital camera over a period of seven years. By his own admission, the participant is not an average person, his interest in lifelogging is influenced by his occupation. However, his experiences of wearing the camera are unique and can inform the development of future lifelogging technologies. A limitation of the research is that it is a single person case study. Unfortunately, a larger sample cannot be easily accessed until more people wear automated cameras continuously over long periods of time. The next stage of this research will be to investigate the attitudes and experiences of the people who encounter CG and his lifelogging camera.

Although the participant CG is clearly a lead user and someone who is willing to encounter the side-effects of extreme lifelogging, both socially and in terms of everyday overhead in wearing and logging from a number of sources/devices, with the advent of new lifelogging devices, and the initial success of Memoto in its kick-starter campaign, it is likely that lifelogging will become a more widespread activity. If this is the case, then the initial experiences and datasets of individuals such as CG becomes very valuable for informing us of the long-term effects of digital life capture and provide some experiential guidelines on how lifelogging could progress in the future.

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