A Survey on Life Logging Data Caputre

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Abstract. With the recent availability of inexpensive wearable sensing technologies, the emergence and of both off-line and on-line digital-storage capacity and an acceptance of personal data gathering and online social sharing (timeline), life logging has become a mainstream research topic and is being embraced by early adaptors. For example, currently we have the ability to gather and store large volumes of personal data (location, photos, motion, orientation, etc.) in a very cheap manner, using an inexpensive smartphone. However, with many available life-logging tools, the question of which ones to use has not been seriously addressed in literature.

In this work, we report on a survey of various approaches to capturing life logging data, which includes the SenseCam/Vicon Revue, wearable smartphones, wearable video cameras, location loggers using GPS, Bluetooth device loggers, human body biological state monitors (temperature/heart rate etc.) and so on. We compare these devices and analyze the advantages and disadvantages of different capture methods, including the consistency and integrity of capture, the life coverage of the captured data, as well as peoples attitude and feeling to these data capture devices, which we do through user studies and surveys. To complete this work, we provide our opinion of the most suitable model of data capture for personal life logging in a variety of domains of use.

Keywords: Lifelogging, Wearable Sensors, Survey, Lifelog Devices

1   Existing Devices

There are various gadgets that can be used in lifelogging, from wearble to fixed devices as shown in Figure 1. We classify all possible portable and stand devices to four main categories.

- Wearable Cameras
  Currently, wearable cameras for lifelogging include SenseCam, Video glass, Looxcie, Go-Pro, head-mounted camera etc. These lifelogging tools share a common functionlity, that all of them can consequently and passively take pictures of what users see in front of them. These images can be applied Memory Enhancement[4,7], Life Style Detection[1] and Health Management[3,6].
- Biometric Devices
  Biometric devices are can sense human body conditions and gather continious signal of galvanic skin response (GSR) and skin temperature (ST)

Fig. 1: Existing Devices for Lifelogging

, physiological responses such as changes in heart rate or increased sweat production, sympathetic nervous activity etc[5]. They are Polar Heart Rate Monitor, ReadiBand, BodyMedia SenseWear Armband that does sleep tracking from yourwrist, Foster Miller vests (respiration, body temperature, heart rate, gps), Posture monitoring vest (18 wearable plastic optical fiber sensor outside the garment, on the spine, coaled in paint and scratched along one side, used for measuring bending on structural beams) etc.

– Fitness Devices

Fitness devices are getting popular these days as they are proved to be effive when used for maintaining people's good living habbit or preventing users' energy expenditure[2]. Fit-Bit, Nike+Pod, which record fitness data, belong to this category. These devices are normally small and comfortable to wear.

– Non-visual Wearable Devices

Non-visual wearable devices are electric devices that are wearable but do not take any visual content about wearers' life. These non-visual content about wearers can scale from location data to bluetooth data. They include Logger, GPS checking devices.

– Unwearable devices

These are devices that are not portable but also have been used in lifelogging in the way of online interaction, emails, image posts, mouse movement, browser history etc. These include personal computers, CCTV system etc.

2   Data Caputre Matrices

Here we firstly compare different devices according to their technical comparison:

Devices	Data Sharing	Recording Frequency	Intended Usage Time
SenseCam	manual	frequently (every 3s)	All day
Looxcie	manual	continuous	up to 4 hours
Smart Phone	automatic/ manual	Frequently (user defined)	up to All Day
HR Monitor	manual	continuous	workout
PC	automatic	user defined	PC-on time
Eye-tracker	manual	continuous	up to 4 hours
Accelerometer	manual	1 4000 HZ	user-dependent
GPS Logger	automatically/ bluetooth sync	continuous	all day
ReadiBand	manually	continuous	sleep time

Table 1: Technical Comparison of Lifelogging Devices

3   Data Caputre Matrices

Life Logging Data(Captured)

Devices	Pic	Audio	Location	Bluetooth	Noise	Movement	Heart Rate	Email /Webpage	SMS	WIFI /3G	user feeling
SenseCam	✓					✓					15
Looxcie	✓	✓									9
Smart Phone	✓	✓	✓	✓	✓	✓		✓	✓	✓	23
HR Monitor						✓	✓				15
PC	✓	✓	✓	✓	✓			✓	✓	✓	23
Eye-tracker	✓		✓								null
GPS Logger			✓								23
ReadiBand							✓				10
BodyMedia							✓				12
CCTV	✓										null

Table 2: Lifelog Data Types Captured by Different Devices. User survey result.
Total participants = 23, user feeling is the number of people who have positive
feeling to use devices.

4   Issues and Concerns

From Figure 2, we found that: 1) most people have positive attitude to wear
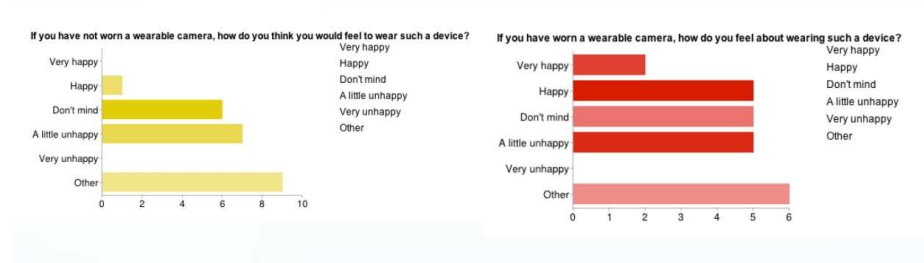a camera; 2)people who feel unhappy mainly considering other peoples feeling

Fig. 2: Issues and Concerns about Lifelogging

to them; 3)people have more possibility to like to wear the device than they thought.

We asked participants to tell their real thoughts about what they really concern if they are supposed to do lifelogging. We found that there are three dominant conerns that might cause people not to do lifelogging: privacy, appearance, comfort. With considering the feedback from participants, We draw some thoughts that we have to carefully examine how we design a device and how we interact with private sensor data.

– Privacy
  "Thinking about my personal privacy, I need to make sure my personal data such as where I am at a certain time of the day is not revealed to the public." "I am uncomfortable with there being no control over the images being published to the web, too much like a big brother society."
– Privacy
  "People feel Strange!", "Feel a little weird, people often stare at the device wondering what it is. Uncomfortable with every moment being captured."
– Comfort
  "a little uncomfortable. the device is heavy when wearing it"

And from this survey, we also got able to realize there are still many challenges that we have to face.

1. Cheapest/Portable way to capture life logging,
2. Compression of life log
3. Real-time life log of pictures/GPS/Bluetooth/activity
4. Individual narrative diary generation
5. Display personal logging data in a more readable way.
6. Data Storage: public management platform, secure storage, personal computer
7. Multidisciplinary cooperation for human health and entertainment

5   Conclusion

n this paper, we described how we gather data for personal life Logging, and compare the different types of data gathering devices. We also talk about what

we can do in future, issues we should concern in gathering, usage of different types of data. In the future, we might be able to design and develop lifelogging devices that are personalized to user requirements, multifunctional to easy users load and can do total capture.

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