Native Visualization of Mobile Activity Pattern

Bachelor Thesis in Computer Science

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Erklärung

Hiermit versichere ich, dass ich diese Bachelorarbeit selbstständig verfasst und keine anderen als die angegebenen Quellen und Hilfsmittel benutzt habe.

I hereby declare that I have created this work completely on my own and used no other sources or tools than the ones listed.

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Part I

Chapter 1 Introduction

Since the introduction of the smartphone and its ongoing boom in sales, those devices getting more and more important for their users. Nearly 30% of the German population have a smartphone and 50% of them use it on a daily basis [2]. Googling a question, making a phone call, sharing your location and status with your friends via facebook or just taking a snapshot of your lunch - smartphones are used in nearly every location and situation. With all these possibilities and potential in usage for everyday situations, it is getting harder and harder to keep track of when one has used its smarthphone, where it was used and most important, for what was it used. 72% of owners state that they use their smartphones at work [2]. The obvious question is, did one used its smartphone for relevant research or emailing, or was it used to chat on whatsapp or checking facebook. It would be desirable with view to productivity if by the end of the day one could check his or her smartphone activity and would see that it was mostly used to get work done.

Smartphones and their daily usages

Another situation in which nine out of ten users utilize their device is while they are on the move [2]. Again, it would be desirable if one had information how he or she got from place A to place B, how much time it took and what has been done in this time.
Not only has the computation power of smartphones significantly improved, their integrated cameras are also quite satisfying and are comparable to low-end digital cameras. Since most people tend to take photographs with their smartphone nowadays, it would be helpful to get a simple overview in which one can easily see the exact position of the photographs location without taking any further investigation.

Need of a structured overview

There exists a need of a structured overview to get a self reflecting impression about one's activities.

1.1. Objectives

Requirements for
the application

Due to the stated need of an application which provides information about one's daily activities the main goal of this bachelor thesis is to create such an application. The requirements for an application like this are high. On the one hand it should display enough information to grant the ability to draw conclusions about one's daily activities but on the other hand it should also display the data in a visual appealing and intuitive way such that the visual appearance is not to crowded with unnecessary information.

The application should also offer the possibility to take minor adjustments to fit in one's individual needs and thus making the experience with the application feel.In contrast to that those adjustments should not be to detailed and low in number to keep the options structured and understandable.

Applications for
partial solutions

As mentioned the main objective of this thesis is to create an application which provides feedback and a self reflecting view for one's daily activities. There exist applications that partially fit in the described situation and offer solutions. For example one can use Google Latitude to see where he or she has been traveled respectively which routes were taken to reach a specific place. But it will not show which applications have been used at a specific place. Also while this thesis was written the support for Google Latitude was discontinued [4]. Another partial solution is facebook. One can share his or her location and photos on facebook but this will not show a route on a map nor does every one want to public his or her whole life on facebook.

To see the most used applications of the day one could take a look at the operating systems utilization chart which displays the percentage of used battery life and shows the cpu usages in total time. Not only does it not take into account the visited location this is also a very impractical and non intuitive way of gathering information about one's daily activities.

The application of this bachelor thesis should perform as a central information provider which combines the listed objectives and displays the daily activities of the smartphone. Those information will be presented in various ways and can be filtered by different criteria within a clear, intuitive graphical user interface.

Chapter 2 Background

In this chapter provides background information about the main topic of this bachelor thesis. First, the ongoing trend of using a smartphone in nearly every situation and thus need of keeping track of one's own mobile activities is discussed. To grant an application the possibility to give self reflecting impressions the application itself needs to be provided with personal data of the user. The second section talks about this provided data, its origin and how it is gathered. Once the origin of the information is discussed the next section talks about the representation of this it. In this context the meaning of native visualization is explained and an alternative is presented which involves a short introduction of a currently written master thesis. The last section lists and explains which hardware and software was used during the implementation.

2.1. Self reflection

Communication, social networks, camera, games, news, shopping, music and many more categories exists which describe a smartphone. As mentioned in the introduction, smartphones are used in nearly every situation. It is a modern multitool which is used by millions of people in Germany [2].
As advantageous as it may be in everyday situations, the downside is that most people do not know how much time they spend on their phone and thus do not know how distracting it may be. For example, checking new mails may lead the user to also check the newest facebook messages and stay within this application a few minutes longer than expected. Because at least 50% of smartphone owners use the Internet with their device [2], thus most people are always available through instant messaging services

smartphones as modern multitools

like whatsapp. The result is that people write and receive messages more often. And because smartphones are capable of running diverting games, one may be uses its device to beat the last high-score.

Distraction   Smartphones can be great helpers to get things done, remind upcoming events or even as a navigation system, but these short examples demonstrate that they also have the distracting power which one may not be able to assess without any tools.

Provide a self reflecting view   At this point the help of tool is needed which provides information about the owners mobile day in a self reflecting manner. This tool in form of a smartphone application should display the information such that the user is able to instantly see where, when and for what the device was used. If one is provided with this data, he or she is able to say, that they used their smartphone in a productive manner or if they used it for entertainment. Further more, one could tell if he or she used the smartphone to divert themselves from working or studying. Also the application can only show the information, the conclusion must been drawn by the user.

With this information a user of the application may rethink his or her work or study behavior, granting a boost in productivity and efficiency.

2.2. Provided Data

2.3. Native Visualization

2.4. Hardware and Software

Part II

Chapter 3 Implementation

"It's done when it's done"

—An English Phrase

3.1. Paper Prototype

3.2. Time Schedule

3.3. Basic Layout

3.4. Data Management

3.5. Mapview

3.6. Chartview

3.7. Timeline

Chapter 4 Evaluation

Part III

Chapter 5 Conclusion

5.1. Review

Appendix A Bibliography

Online References

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