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Analysis of the data collection mobile user to create technology generations recommendation reports

Andrey Skrypnyk[1], Helen Khalus [2]
[1]undergraduate, NTUU “KPI”. Skrypnik.andrew@gmail.com
[2] senior teacher, NTUU "KPI" http://www.asu.ntu-kpi.kiev.ua/Kafedra/teachers/Halus_O_A/

Lifelogging (Eng. Life-logging, and log on life - "life" and "logbook") - automatic recording of daily life in the digital media using compact portable technical devices and systems. The problems concerned lifelogging many modern companies and corporate projects. But all they solve only some problems and focused on specific corporate requirements. Custom solutions focused on static parameters and view in graphs.

But technology and a very promising direction lifelogging - allows more faithful forecasts for physicians and insurance companies. For the employer - indicators of life balance between work and rest. Purpose and objectives of the study is research is to develop a recommender system based on user context information. This article discusses the first stage - the collection and analysis of the static data.

Keywords: expert system; processing contextual user data; algorithm to generate recommendations; the collection of personal data of the user; iOS application; web server

1. Introduction

The problem is large noisiness data and the small number of public tools for its complex processing tasks within user behavior analysis.

Existing applications and systems offer only a static analysis of the data in graphs and all recommendations based on user count metrics and compare them with expert estimates.

Software technology designed to solve the problem analysis and recommendations as to individuals and companies that analyze the behavior of their employees during the working day, but you first need to understand the quality of incoming data to analyze and assess the correctness of the data.

2. The problem

Modern mobile devices are sufficiently accurate sensors for counting steps, movement, location. They have already partially processing the data of mobile applications, but the algorithms they use - trade secrets and know how we get the correct data, known as measurement error and other statistical data that would help us to assess the correctness of the data.

The data will be transmitted via wireless networks Edge, 3G and WiFi [1].

Additionally, please note that the phone's sensors can greatly affect the amount of energy used to operate the device. Therefore, we must implement three modes of application - Low, Middle, Accuracy.

Low - data is collected only when user location significant changed.

Middle - user data is collected every 120 seconds.

Accuracy - user data is collected every 10 seconds during walking and cycling every 30 seconds during car trips every 120 seconds in a stationary position.

3. The algorithm for data collection of mobile Transporting the server, Conflict Reconciliation and statistical

STEP 1. The user chooses one of three modes of application (Low, Middle, Accuracy) for saving phone during the process of gathering information.

Step 2. Collect data to a mobile device from a variety of sources to which you have access.

STEP 3. Stack collects data before sending to optimize server load.

STEP 4: Making the initial processing, remove the conflict, to reduce noise.

STEP 5. Normalize the absolute value data.

STEP 6. When the stack limit is achieved - send data processing to the server.

Step 7. When receiving data - server decides further merge-conflict challenges and stores data.

Step 8. When user request data - server generates user activity, distributing source data types and categories (sleep, work, activities, entertainment and travel).

STEP 9. Server begins background analytics to process user data to find patterns between his behavior and some basic patterns of behavior.

Step 10. After finding differences for a particular user - server generates recommendations for leveling differences between current behavior and the selected pattern.

STEP 11. Mobile application, if the server has recommendations - displays them to the user.

Step 12. The result of the algorithm is structured data in JSON format.

4. Results

Thus, said collection and processing algorithm was implemented in the iOS [2] mobile application and .NET application server. The algorithm was tested on iPhone 7 in different environments and has the following results. In testing attended by 4,000 people. Residents of Kyiv. Men (70%) and women (30%) aged 18-24 - 12% of 25-34 - 74%, 35-54 - 13%. More than 65% are interested in business and technology.

4.1. Career

Figure 1 shows the total amount of time people spend at work on weekdays, less time people spend on lunch.

Average time: 5:40

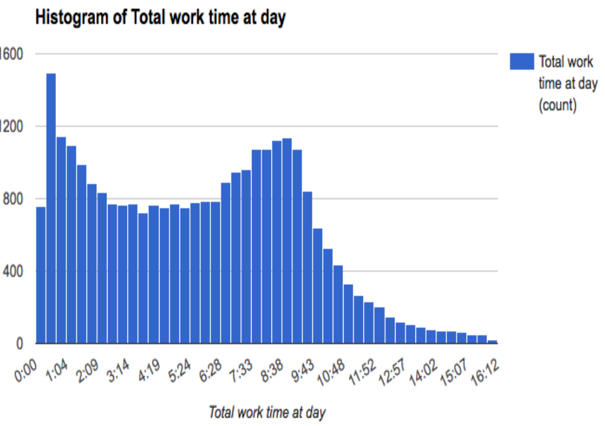

Fig. 1. The distribution of working hours during the day

Figure 2 shows the amount of time people spend at work on weekdays, without interruption.

Average time: 3:12.

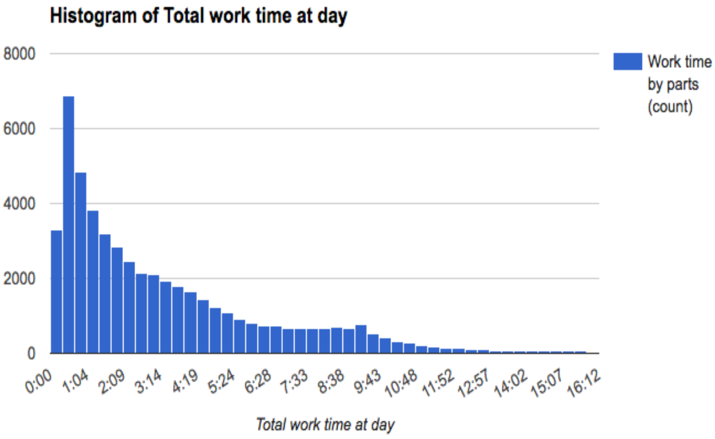

Fig. 2. The distribution of working time during the day in parts

Figure 3 shows the hour when people come to work.

Average time: 10:59.

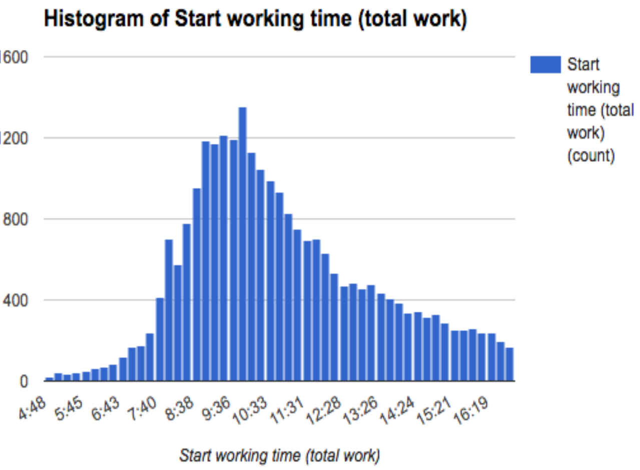

Fig. 3. Start time working hours during the day

Figure 4 shows the hours when users are leaving work.

Average time: 18:17

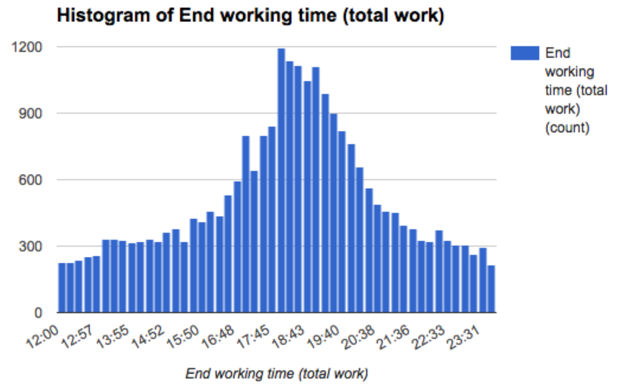

Fig. 4. End time working hours during the day

4.2. Sleep

Figure 5 shows the time that users are asleep. Average time: 7:37

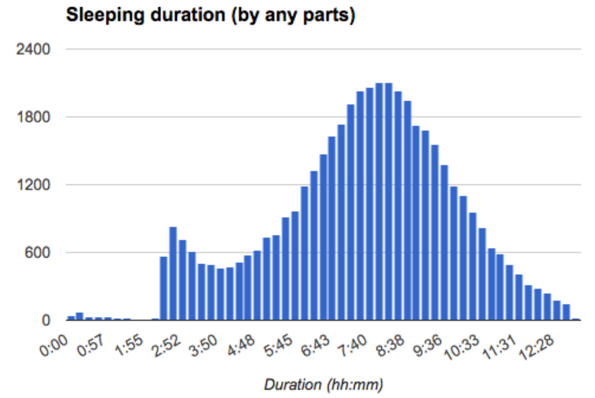

Fig. 5. Average length of time sleeping during the night

4.3. Active

Figure 6 shows the average time of activity a day.

Average time: 1:53

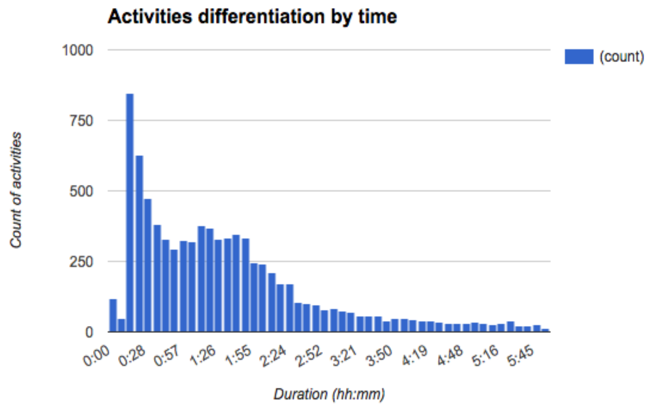

Fig. 6. Average duration of sleep some time intervals

Figure 7 shows a high amount of activity every day.

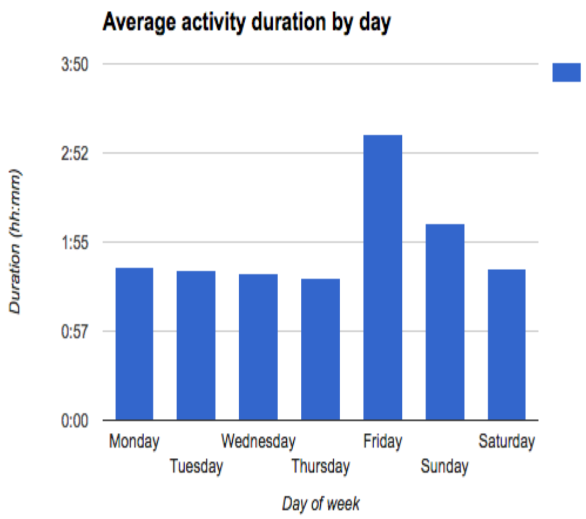

Fig. 7. Distribution of mean time activity by day

5. Conclusions

Thus, the algorithm is implemented in the iOS mobile application and server for .NET [3]. The graph shows quite a lot of data, the truth of which you want to check. Records the amount of time of less than 4 hours per day, sleep duration more than 10 hours before the end of the 14:00 pm.

The future plans - to continue to develop and improve the algorithm, in particular to develop an interactive system confirming the correctness of the data by the user. It is also planned to reduce the% error in data collection devices.

References

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