CSCI 5708

Mobile Computing

Reading Pair - 02

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[1] André Rodrigues, Hugo Nicolau, André Santos, Diogo Branco, Jay Rainey, David Verweij, Jan David Smeddinck, Kyle Montague, and Tiago Guerreiro. 2022. Investigating the Tradeoffs of Everyday Text-Entry Collection Methods. In Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI '22). Association for Computing Machinery, New York, NY, USA, Article 378, 1–15. https://doi.org/10.1145/3491102.3501908

1) What is the motivation behind the work ?

Typing has become tedious tasks nowadays. Typing gives many insights such as typing method, context, individual traits of typing and so on. Investigators are using many methods to examine behaviors of typing but there is limited understanding of effects these methods have on behaviour. The motivation behind this work is to the impacts of everyday typing in the wild (real environment). The aim is to get results with various data collection methods by understanding the coverage and compliance, performance, and user experience.

2) What is the author's methodology ?

To study nature and effects of typing on the lives of mobile phone users, authors conducted one week field study. The study consists of two remote observed sessions (briefing and debriefing) with 4 weeks of free typing[1]. Authors have explored three different data collection methods namely experience sampling with transcription tasks (ExpT), experience sampling with composition tasks (ExpC) and passive sensing(PaaS).

Participants had to install authors experimental Wildkey Android keyboard on their device and they have to use it as their primary keyboard. For briefing sessions, participants got an information sheet and a report with mock-up of the type data and authors scheduled 30 minutes remote call with each participant for the brief introduction of the study goal and protocols[1].

For observed transcription, authors asked the participants to open a keyboard and write some short sentence then they asked users to start transcription task that has been scheduled. During the period of time, Wildkey prompted participants to complete transcription tasks by notifying them with a notification. Composition task is also done in a similar way but in this, participants have to three questions or until they have written 75 characters or more. At the end of each weekend, contestants were asked to fill a questionnaire about their privacy and acceptance of data collection methods. Finally, the authors took a semi-structured interview asking the participants about their experience in the activity, privacy, efforts obtrusiveness of each method[1].

3) What are the results ?

After the experiment, 26 participants have entered approximately 1.1 million characters over 4 weeks. The dataset contains total of 38,531 independent text-entry trials in passive sensing, 641 transcription trials and 337 composition trails[1]. Wildkey prompted participants to

complete 15 transcription tasks in a week and 15 composition tasks in another. Overall, participants completed 71.5% and 88.7% of composition tasks and transcription tasks respectively[1]. Afterwards, authors compared input speed, accuracy, touch dynamics and text-entry behaviours. The estimates of fixed effects revealed that PaaS is slower. Contestants reflected that transcription is easy to do and composition tasks requires reflecting and thinking about what they have to write. Also, participants have higher error rates during PaaS and ExpC. Apart from this, participants had chance to use suggestions and auto-correct but still they relied less on those in experience sampling and observed transcriptions.

4) How does it impact the mobile computing community ?

Everyday text-entry collection from real world environment is highly debatable. While this dataset can provide a chance to the community to in mobile interaction design, linguists, biometrics, and digital health. Everyday text-entry collection methods not only had a notable impact on the typing dynamics and behaviours but also impacted on the participants willingness to trust the experiments. This experiment will provide in depth understanding of the trade-offs between data collection methods that can inform the future design and provide new guidance and approaches to improve user acceptability of collecting data.

[2] Simon T. Perrault. 2016. A Discussion on Time Optimization for Games in Mobile Computing. In Proceedings of the 3rd Workshop on Mobile Gaming (MobiGames '16). Association for Computing Machinery, New York, NY, USA, 11–15. https://doi.org/10.1145/2934646.2934647

1) **What is the motivation behind the work ?**

Video games have been proven to enhance cognitive, social, and academic skills, and if society accepts this, video games can be further explored for uses beyond entertainment. Accuracy and speed are typically considered while evaluating interactive systems. One can also think of the issue as a min-min trade-off between time and error in place of such a max-max trade-off[2]. Time is frequently thought of as a quantity that should tend towards zero, such as reaction or execution time but time has such a broad definition, not every time measurement needs to be negated or diminished. In order to increase user involvement in a game, the motivation behind this work is to examine various definitions of time and emphasise a global time trade-off in which some numbers should be limited, and others should be increased.

2) **What is the author's methodology ?**

The author has used head mounted displays which in mobile context is a see-through display which offer a small screen that may or may-not be transparent[2]. This display is valuable as it can provide additional information on the top of what user sees. The default position of display mounted on eye forces the user to look up, which makes difficult to use for long period of time. Then, author have tried different possible locations for the display. Users will receive random stimuli of three types: colors, icons, and short messages. After noticing that stimuli participants will press button and answer a question about stimulus[2].

In some cases, it may take additional time for the user to notice the stimulus. This additional time is called here "time to notice". To investigate this on a wearable device, the author has designed five rings where each ring can provide stimuli of specific type namely vibration, sound, light, poke and heat. There were 25 participants who wore these rings and perform five different level of physical activity : lying down, sitting, standing, walking, and running. Authors randomly sent stimuli in short 5 minutes session and ask contestants to press a button whenever they notice a stimulus[2].

3) **What are the results ?**

The participants recognize most of the stimuli correctly having accuracy of more than 97% without any major differences in the display positions. The notable difference was seen in the reaction time especially middle center on one hand, and top left, top right, and top center on the other. When considering the text messages, the difference in time is much higher. [2]Therefore, reaction time should be minimized to a value as close to zero as possible. The results for time to notice shows a significant difference in time to notice in terms of light and every other stimulus.

4) How does it impact the mobile computing community ?

The main goal of a game developer in the mobile community is to ensure a long engagement time but this also depends on the user experience which itself depends on minimizing other four time quantities. This paper will have impact on mobile community by providing insights about time to notice a stimulus which offers huge optimization. This also makes one of the priorities for the game designers. The worth considering point in the paper which have significant effect is the engagement time which should be maximized whereas all others should be minimized.