Boredom-triggered Microtasks

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Abstract
Splitting large tasks into a series of smaller, more manageable microtasks has been shown to increase the quality of the work and ease the recovery from interruptions. There are a number of open research questions in this emergent area of working through microtasks, including the ways in which to schedule these tasks. In this position paper, we propose using *boredom* as a trigger for microtasks.

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Attention; boredom; micro-productivity; user modeling

ACM Classification Keywords
H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous; I.2 Artificial intelligence: Miscellaneous

Introduction
Large and complex tasks, such as sorting thousands of digital photographs, learning a foreign language, or preparing a presentation, can be daunting. Recently, it has been proposed to split such tasks into a series of simpler, shorter *microtasks*, as a successful strategy to help users tackle complicated tasks [1] [2]. In order to maximize the success of microtask completion, we believe that both the *what* (*i.e.* the definition of the microtask) and the *when* (*i.e.* the identification if the optimal moment to engage with a certain microtask) need to be taken into account.

Boredom is defined as displeasure caused by "*a lack of stimulation or inability to be stimulated thereto"* [5]. It is an emotional state where the person is actively looking for stimulation.

Boredom-triggered Microtask Engagement

On the basis of our recent work [3] we hypothesize that moments of boredom could be opportune moments to suggest *microtasks* to users, as in these moments of boredom users would be more likely open to new stimulation. Given that microtasks consist of small and well-defined components of a larger task, they could be completed in a small amount of time and they could be a relevant stimulus to provide to users when they are killing time. A challenge to achieve this vision is to automatically identify when the user is killing time while using their mobile phone.

We built a machine-learning model to automatically detect when users are bored while using their mobile phone with an accuracy of up to 82.9% AUCROC. In addition, we carried out a user study where we found that users are significantly more open to consume and engage with recommended content when they are bored than when they are not bored. Based on these findings, we propose to engage users with microtasks depending on their cognitive/emotional state derived from contextual data as gathered by their mobile phone.

Consider the following scenario: people often lack time and motivation to engage in the daunting task of learning a foreign language. This process, however, can be broken down into small tasks including grammar exercises, vocabulary training, and pronunciation exercises. As people exhibit a negatively exponential forgetting curve, repetitions of content need to occur spaced in a way where items are encountered just as they are about to be forgotten [4]. Thus, by identifying these *killing time* moments, where microtasks - such as vocabulary repetitions - are feasible, we can schedule learning tasks optimally while preventing users from being overwhelmed by the macrotask of learning a language. Boredom could be leveraged as a trigger to present such microtasks to the user or to suggest a change of microtasks.

Biographies

Nuria Oliver is Scientific Director at Telefonica Research in Barcelona, Spain. She works on building models of human individual and aggregate behavior from data and intelligent user interfaces. She is an ACM Distinguished Scientist

Martin Pielot is associate researcher at Telefonica Research in Barcelona, Spain. In his current research, he explores how the relationship between mobile phone use, human attention, and emotions.

Tilman Dingler is a researcher at the HCI group in the University of Stuttgart in Germany. He is interested in human memory augmentation through pervasive technologies.

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