

Context Influencing our Behaviour

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Web and mobile devices became very important part of our lives. These are the main sources of information, self presentation, communication or entertainment. To make this everything available almost for free, we silently agreed to share our personal information which is then somehow used by companies to adapt, personalize or recommend the content for us. This respects the model of user and her interests. But we can move to the more advanced level and claim that this interest is influenced by current state of the environment or user herself. This information on the conditions is known as contextual [1].

Contextual information could be applied in many different domains to improve the quality of the model based on user model. For instance, we present AdaptiveReminder [3] as a tool which is able to dynamically adapt the plan for a day according to current conditions. AdaptiveReminder uses history of user movement and passed events to recognize the influence of specific context information on the time needed to transport (eg. it wakes user up earlier due to traffic jams caused by fog).

We designed AdaptiveReminder as the application which tracks user location. We use SSIDs which are commonly scanned through inbuilt wifi module. These SSIDs are used as identifiers of a location. We do not need exact GPS coordinates, we only need to differentiate locations. Sets of SSIDs are assigned to specific location thus we are able to identify location when user returns. Using so obtained context of location is then used to track movement and time needed to transfer from one to another location. We use learnt transport duration to adaptively set reminders for upcoming events. To remind adaptively with weather context, we only enrich learnt transport durations by weather conditions. We are then able to remind according to weather, location and time. Since we are attached to user calendar, we are informed about events. Last thing needed to adaptively remind events is to determine where the event happens. When the event happens first time, we are not able to determine location but as it is ongoing we assign the current location for future reference.

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We also analyse the impact of contextual information on trends in news reading to boost some news to support the interest. SME.sk provides server logs and we are able to predict the interest in topic by analysing the history of SME.sk readers. For example someone reads football news before the match to confidently place a bet. Others are reading recipes before Christmas or Thanksgiving. These behavioural patterns are known as human rituals.

Currently we work with context of time and its derivations (minute in hour, hour in day, day in week, day in month, day in year). We also incorporated location approximation (using IP address). IP addresses and timestamps are also used to determine whether user is at home, at work or somewhere else. Another context used is the content of news. We interpret content using combination of section and category used by authors of news. Each visit made by readers is enriched by this contextual information. Our research is dedicated to infer contextual information which is not available directly. It means that we can infer dwelling time in cases where direct acquiring is not successful.

Another example of our work is code review support. This helps software developers to identify bugs in the code. We monitor software developers and their contextual information while they write code. We learn which context influences the quality and occurrences of bug reports. These rules are then applied to discover problems and leads to marking the code as potentially wrong.

Ultimate goal of our research is to infer context in generic way. Context inference is based on user behaviour. We discovered that not only user has behavioural patterns [2] but there is correlation among behaviour of more users. We have to find behaviourally similar users what enables us to infer context which is missing for some users. For instance, one user has express emotions explicitly while listening to music. Another one is behaviourally very similar but he does not express emotions. We are able to group them according to their contextual history and infer missing context. Knowing his emotions would help to prepare better recommendations or predict his further behaviour.

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References

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