

Managing and using context aware information

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Abstract— In this paper, we present the use of personal interests and context information to personalize a communication service. Algorithms that use information to retrieve content related to a specific topic of conversation were implemented in a prototype application. This application was evaluated by end users in a usability lab.

Keywords—Context Awareness, Personalization

I. INTRODUCTION

Research on context information can be performed in many different fields and disciplines, starting with data gathering using for example sensors, to managing this information (storing/modeling), adding reasoning to it to infer new knowledge or by integrating this information in algorithms and services. Apart from personalization and adaptation, applications are built that help us process information from different sources. By combining these separate pieces of information, one might discover or infer new information that would otherwise remain unknown. . .

In what follows, we take a brief look at work performed on personalizing a communication service.

II. PERSONALIZED COMMUNICATION SERVICES

A. Architecture

An overview of the personalized communication service ([1],[2],[3],[4]) is presented in Figure 1.

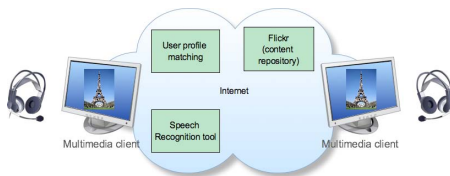


Figure 1. High-level architecture of the use case

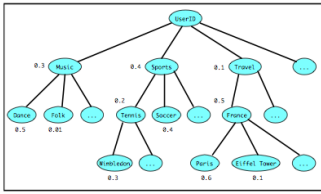
A multimedia client allows users to have a video chat with each other. By using a headset, the users can talk and listen to each other. The audio stream of the conversation is analysed by a Speech Recognition tool, which is capable of extracting keywords from the conversation.

Once words are recognized, they are sent to the User Profile Matching component. This component tries to track the topic of the conversation by means of these recognized words. By keeping track of specific words users are saying, it is also trying to keep track of the users interests. These interests, along with the current topic of the conversation, are used to look up pictures from an online photo repository (Flickr).

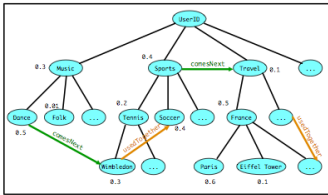
The user interests can either be modelled using a keyword tree (figure 2(a)), which contains keywords representing specific topics of interest or by an ontology (figure 2(b)) to map the personal interests onto certain topics. By using ontologies, richer semantic knowledge (such as relations between concepts) can be used in order to further improve the tracking of the conversation. This way, one can for example map the relation “is used together” on two keywords to store semantic knowledge about the fact that these two keywords are used in the same context.

Once pictures are found, their tags are analy-

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(a)Keyword tree



(b)Keyword ontology

Figure 2. Modeling user interests

sed to rank the results according to their matching with the interests or the topic of the conversation. A selected set of the results is finally sent to the client software. This way, users get to see pictures that should provide an enriched experience in their video conversation. Users can also click on any picture they see on screen to enlarge it or to recommend it to their chat partner. While doing so, they trigger a notification to the User Profile Matching component resulting in an update of the corresponding user profile (user feedback).

B. User evaluation

15 end users in a usability lab of the Centre for User Experience IBBT/KULeuven, evaluated this use case. The focus of this test was to check the user experience more than the usability. Results revealed that the test subjects liked the kind of application they tested, but that they prefer to use it with people they know. They consider the images an added value over an ordinary communication client. The pictures were useful to many users but they considered this an addition over the video feed of the conversation partner, which seemed more impor-

tant to them. The users considered that about half of the time the images were relevant to the conversation. But perhaps the most interesting conclusion was that, after using this application, participants would like to use their own pictures in a conversation with people they know.

III. CONCLUSIONS

We investigated ways of modeling user interests by means of a keyword tree and an ontology. Next to this, algorithms were developed that are able to identify the topic of a conversation and track changes in the topic. We implemented algorithms that search and retrieve content from Flickr, based on tags, that match the topic of the conversation and the personal interests. This functionality was used in an application to show images during a voice communication session. This application was evaluated by end users and the idea was considered an augmented user experience.

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