

Augmented group presence in PASION project: Presentation of a first applications developer prototype

Juan, M.C.¹, Gamberini, L.², Alcañiz, M.¹, Zaragoza, I.¹, Martino, F.²

¹ LabHuman (Universidad Politécnica de Valencia), Valencia, Spain

² HTLab, Department of General Psychology, University of Padova, Italy

Abstract: *PASION is a European project aimed at supporting mediated interaction of large networks of people and augmenting their communication with the provision of group presence cues. These cues consist of indices of the group's activity, self-reported data and physiological information that will be presented to players, and they will improve the group presence. This is the main contribution of PASION. In this paper we present a first applications developer prototype and the first hunting game created with it, Bluenet. Bluenet supports a collaborative activity, treasure hunting, distributed across the large space of a city and mediated by mobile phones (later PDAs, etc.). As such it can be used for applications in which group cooperation must be improved, with the additional advantage of making the degree of cooperation immediately visible as feedback during the game.*

INTRODUCTION

This paper describes the characteristics of a first applications developer prototype for supporting users' collaboration and including augmented interaction features. It is designed within PASION (Psychologically Augmented Social Interaction Over Networks), an ongoing Integrated Project funded by the European Union and involving 18 partners from 8 different European countries. PASION research, technology and applications are aimed at improving the efficiency and effectiveness of goal-oriented groups engaged in social (many to many) interaction in mediated environments (for a review of Computer Mediated Communication, see Thurlow et al., 2004, Walther et al. 2005), with a particular emphasis on large groups in which interaction occurs on a long term basis (e.g. professional communities), creating a complex network of relations. The idea is to create a communication environment where the group-level social presence is made visible to people, in contrast with the great prominence that is usually given to interpersonal presence. The project will identify some relevant group dimensions to be displayed and implemented as cues in the prototypes (Brugnoli, Morabito, Walker and Davide, 2006).

Cues will be obtained from three sources: automated recording of the users' activity and position, self reported data, and physiological data.

A great deal of cues will be elaborated by using the methods and metaphors of Social Network Analysis (Wasserman and Faust, 1994), which enables the display of the group structure in an intuitive yet precise way. The structure can be obtained from several different kinds of data; in the prototype it is possible to select the kind of data and visualization that is more appropriate for a specific application. A technology such as the one developed in PASION can serve a variety of purposes, wherever it may be useful to make people engage with each other on the basis of a collaborative activity (e.g. improving cooperation, cohesion, perspective change) and to have the group status visible to the members/administrator/therapist (e.g. group therapy). For instance, feedback based on the provision of Social Network indices can be used elsewhere to increase people connectedness between people, and avoid the social isolation (Morris, 2005) or to investigate the change in harmony or attitude balance (Heider, 1946) inside small groups acting in a Virtual Environment (Nakanishi, Nakazawa, Ishida, Takanashi and Isbister, 2003).

The applications created using the first prototype such as Bluenet will run on mobile phones; a desktop version with scalable complexity will soon be added. Bluenet is a Bluetooth-Mediated Social Interaction in

Outdoor Digital World; it consists of a Treasure Hunting game where participants have to visit a real city in order to find a final target and the clues leading to it. The communication medium allows the delivery of clues to the participants' mobiles, taking them from site to site till the final one. Once a specific site is approached, the Bluetooth device sends the next clue. Communication among people in a group is necessary to collaborate and interpret the clues, as well as to find the corresponding sites in the city; the technology prevents single members to progress alone in the game or to skip some steps. Participants can locate themselves in the area through a map visualized on the cell-phone, and can also access the data on their group activity in terms of progress made in the game and quality of interaction between them. Bluenet can be used to encourage people to collaborate and exchange information in order to achieve a common goal, and to make them attentive of the communication structure in their group, individuating possible communication breakdowns and isolated members.

A first applications developer prototype

A first applications developer prototype has been developed. The applications developed using it, works on mobile phones and it has been developed in Java; information storage is based on a native XML database, 'eXist'. All elements needed for an application can be grouped into XML schemes. For example for Bluenet, these elements are: (a) the invitation routine; (b) the invitation sentence; (c) the rules of the game; (d) the goodbye message; (e) error messages; (f) the pieces of the map; and (g) the clues for each site. All this grouped information can be automatically translated into a XML scheme as follows:

- Instructions
 - Invitation - text
 - Rules
 - 1 – text
 - 2 – text
 - N – text
 - Goodbye - text
 - Error – text
 - Map and sites
 - Map
 - Pieces
 - * 1- image
 - * 2 - image

- * N – image
- Clues
 - * 1 – text
 - * 2 – text
 - * N – text

On the basis of this grouping, the XML scheme for Bluenet can be created; it will include the data of the city, the game-relevant sites in the city, the clues to the sites, and will allows to modify, add and eliminate part of the information. This means that the software will have to allow the creation of XML schemes, filling in the existing XML schemes, and finally create mobile applications. Let's consider all these functions one by one.

Creation of XML schemes. The first step before any other development is the creation of the XML schemes. For achieving this, a graphical application has been developed, which allows introducing the different nodes and subnodes that form the XML scheme as well as the type of information of these nodes (text, image, number, sound, etc.).

Filling in the existing XML schemes. Once the XML scheme has been defined, it is necessary to select an existing XML scheme and to assign values to its nodes/fields. This is the way the database is updated; it has to be stressed that no XML knowledge is needed to run this application once developed. Nevertheless, the user has to know how introduce the right data in each part.

Both steps can be joined in a unique application allowing both the creation of XML schemes and the selection of one of them to fill in, and endowed with the following functionalities:

- a) Creating new XML schemes and store them in the database (Figure 1).
- b) Showing the XML schemes stored in the database (Figure 2).
- c) Deleting existing XML schemes from the database
- d) Updating existing XML schemes and store the changes in the database (Figure 3)
- e) Filling in an existing XML scheme and store it in the database
- f) Showing XML files stored in the database
- g) Deleting existing XML files from the database

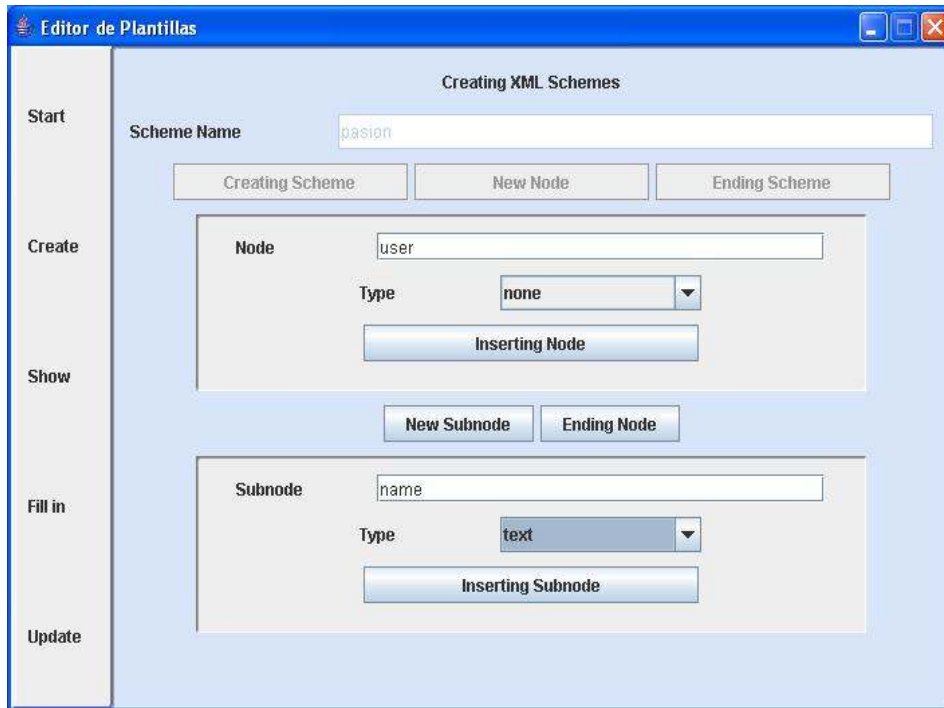


Figure 1. The graphic interface to create XML schemes with nodes and sub-nodes; the XML scheme in this example is called 'pasion'.

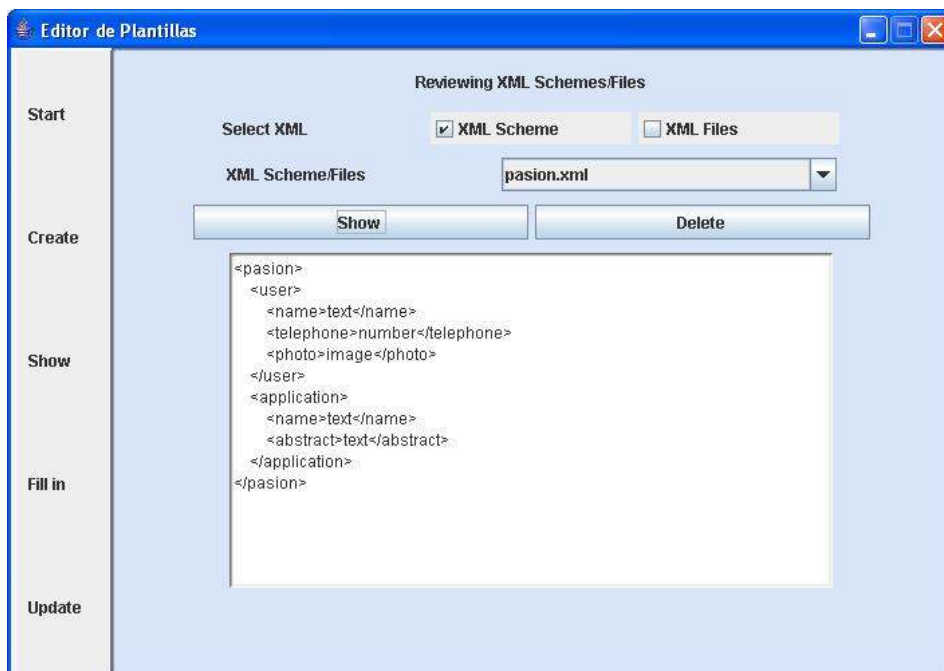


Figure 2. A selected XML scheme/file can be visualized in XML format. The XML scheme is called 'pasion.xml'



Figure 3. The graphic interface to update XML schemes/files by modifying the data contained in its nodes.



Figure 4: The graphical interface to updating XML schemes/files; the XML file is called here 'pasion1'.





For the time being, the type of information that can be stored in a XML file includes text, number, image and sound. For images and sounds, it is possible to select a file and upload it to a web server. The XML file stores the web address in order to access the image and sound file.

Development of a tool for the creation of mobile applications. Applications will be developed using the XML schemes and files, and Java classes. This first prototype will evolved during the life of the project in an incremental way. In

this way the development of the final application will be much simpler, since it will be enough to use the provided classes.

Appearance of Bluenet

Now, Bluenet runs on mobile phones, but later, PDA's and other devices will be used. An example of execution using the Nokia 6600 is presented next. The players will use Bluenet in a way similar to the following script.

	<p>A player arrives to the starting site and is invited to join the game with a message on the cellphone.</p>
	<p>Upon acceptance to participate, the player is invited to join a team; all teams that are currently participating in the game are shown and the player can choose or be assigned to a selected team, according to the rules of the game. The list of clues is shown on the screen of all team members, only one of them providing the correct information. The players in a group can communicate via SMS or phone calls between them. Players pay for the SMS and calls.</p>
	<p>Players' arrival to the right site is detected by a Bluetooth device, and it is notified by a message sent automatically to all members of the group (correct site/incorrect site); in case of correct site, the next list of clues is shown together with a partial image of the site. Site after site, the whole image of the target will be completed as in a puzzle.</p>
	<p>The game goes on until the final site is reached.</p>
	<p>During the game, players can have extra information about their social interaction with other players and a map view (left image). The map view shows the sites already visited by players, using for it the information stored in the Data Base (the sites are recognized using Bluetooth devices)</p>
	<p>When all the pieces of the puzzle have been accumulated, and the complete image of the final site is displayed, the team is able to recognize the target. The game ends when they reach it.</p>

CONCLUSIONS

Bluenet proposes a treasure hunting game that lends itself to a variety of applications in the area of education, therapy and entertainment. Its peculiarity resides in the ability to support mediated interaction, to allow the modification of the set up in order to meet the requirements of each specific usage and to implement the result of psychological research in the area of group feedback. On these bases, other modules of the applications developer will be created in order to obtain an integrated, scalable system that can run in open spaces as well as in fixed stations indoor, and provide a wide variety of social cues to users.

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