

JaGD – An Photo Oriented Learning and Gaming Platform for Mobile Phones

Albrecht Schmidt¹, Enrico Rukzio², Eva Vodvasky¹, Alexander De Luca¹
¹ Embedded Interaction Group, ² Media Informatics Group, University of Munich
{Albrecht, Eva, Alexander}@hcilab.org, Enrico.Rukzio@ifi.lmu.de

ABSTRACT

Mobile phones with camera and network connections are ubiquitously available. In this poster we describe a platform for photo oriented games and learning applications that make use of such devices. The system consists of a web based authoring tool and a runtime environment on the mobile phone. Games and learning applications are made up of a set of tasks that have to be carried and documented with the phone camera. Results are uploaded to a server. The server supports discussion and voting on pictures. In this poster we present implementation details and initial usage results.

Keywords

Mobile Gaming and Learning, Mobile Phone.

MOBILE GAMING AND LEARNING

Mobile phones offer very good mechanism for media capture and networking. As such devices are ubiquitously available; systems have been suggested to use mobile device for gaming [e.g. 1], learning [2] and blogging [3]. One great advantage is that users can interact in their real world context while learning or playing.

In our work we concentrate on a subgroup of applications which are characterized as follows. We refer to an application as *game* – even if it is used as a learning application.

- A game consists of a set of tasks (ordered or unordered).
- Each task can be completed with a media capture step (e.g. taking a photo).
- The media captured in each step is stored and communicated to the server.
- On a server the capture results for each step and each participant can be viewed.

The following scenario illustrates the use of the system as a learning platform. A teacher preparing a field trip to learn about plants in the wood uses the system. She describes tasks using JaGD-Editor which is provided on a web page. An Example tasks is: *Look for an oak tree, take a picture of the tree, the bark, and a close-up of a leaf.* After she has created enough tasks she exports the game and makes it

available to the pupils. The pupils download the game onto their mobile phone. During the field trip the pupils play the game following the task descriptions to capture appropriate images and upload their results to the server. After the field trip all photos taken are available on the website. Now pupils and the teacher can vote on the best pictures for each task using the web interface.

Similar to field trips we have identified a number of application areas in teaching (e.g. cooking class, experiments in science, and observation tasks in biology). In the area of entertainment we found domains such as tourist treasure hunts, party games, or new comers orientation games, where this type of games can be used to create a more engaging experience.

IMPLEMENTATION

The JaGD system is implemented as a client server system, see figure 1. It includes a backend system and clients that run on mobile phones. The software is available open source on our website, see [4].

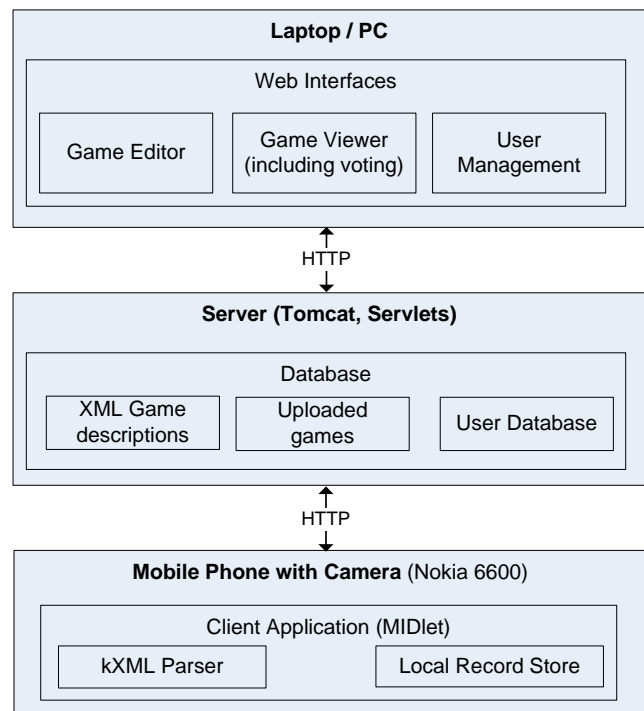


Fig. 1. Architecture of the JaGD system.

The backend is implemented in Java (Servlets) on a Tomcat server. It includes a game editor, a viewer, user management, and voting. The games created with the editor

are available for download over HTTP. The upload of pictures to the server can be done over HTTP as well.

For the mobile phone a standalone application is implemented as a MIDlet. The MIDlet is the platform that downloads a game description over HTTP and runs then the game. During the game the user can be off-line. After finishing all tasks the locally stored pictures are uploaded to the sever by the MIDlet. The application on the client side uses the J2ME API and currently works on the Nokia 6600 (Java 2 Micro Edition, MIDP 2.0, CLDC 1.0). Game instructions are provided as XML documents by the server and therefore have to be parsed on the mobile client. We used kXML as a small pull parser that is designed for use in MIDP environments. The parsed values, user data and photos are saved in record stores. The built-in camera of the mobile phone is controlled using the Mobile Media API (JSR 135). To provide an individual look-and-feel, the UI is composed of customized items.

APPLICATION WALK THROUGH

Using the system can be separated in three phases: the game creation, playing the game, a discussion and voting after the game.

In the game creation process the author gives the game a title and provides a short description of its purpose. It can be defined if the tasks have to be performed in the order set by the author or if users can do it in an order they want. Then the tasks are described, each with a short explanation. For each task the author can specify the number of pictures that can be taken and how many points one gets for this task. In figure 2 the game editor is depicted, showing the overview for a Munich city game.

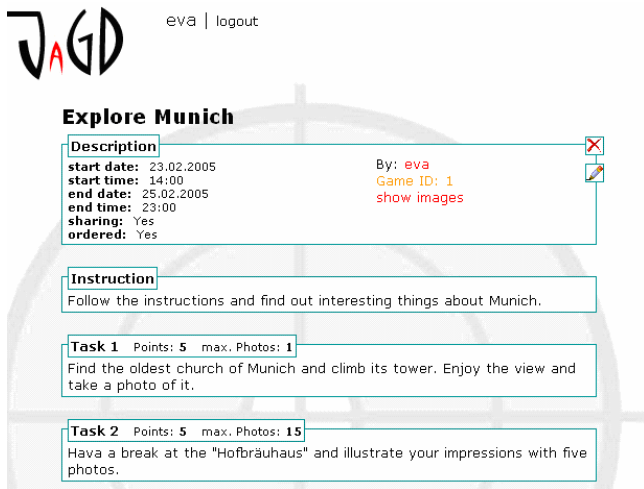


Fig. 2. Game overview for the Explore Munich Game.

When playing the game the tasks created with the editor are displayed on the phone. In case the game author decides that they need to be completed in order the user only can select the next task otherwise the user can freely choose which task to do. In figure 3 the mobile phone screens for a single task are show.

When all tasks are completed or the time is up the user can upload the pictures. On the server the pictures are

presented for other participants in the game to look and vote.

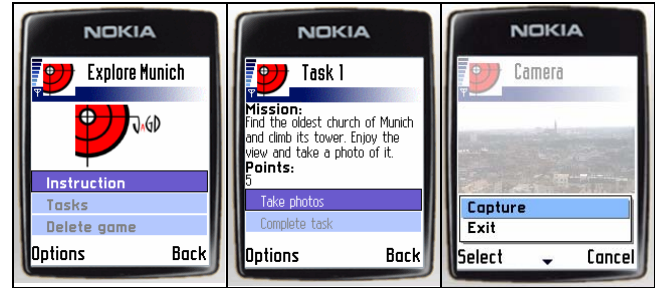


Fig. 3. After starting the game the user can select a task and take a photo.

EVALUATION AND INITIAL USER EXPERIENCE

During the development phase of the system an expert evaluation was performed to improve the initial usability of the system.

In a user study game authoring, playing, and voting were evaluated. We had 5 male and 2 female participants in the age between 22 and 38. All participants understood the concept and several suggested potential application areas for this platform (e.g. museum guide). Besides minor technical issues (e.g. colour highlighting in menus) the game demonstrated to be very playable and enjoyable. Further ideas for multiplayer gaming based on this platform emerged in discussions.

CONCLUSION AND FUTURE WORK

In this we have presented a system that allow easy creation of task based games that uses photos as central media for documentation. Our initial evaluation shows that users understand the concept and can create games and enjoy playing them. Proving an easy to use editor is a central issue for the utility of the system.

Currently we are including a feature that allows participants to share or trade photos during the game. Over the next month we will run user studies in the domain of tourism.

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