



ABCDE



Scientific Report

First name / Family name

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Name of the *Host Organisation*

Fraunhofer - Institute for Applied
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of the *Scientific Coordinator*

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Period of the fellowship

01/11/2011 to 31/10/2012



I – SCIENTIFIC ACTIVITY DURING YOUR FELLOWSHIP

The ERCIM postdoctoral fellowship was carried out within the Mixed and Augmented Reality Solutions (MARS) Group at the Cooperation Systems department. As a visiting researcher at the Fraunhofer FIT I have attended internal meetings of the MARS group and numerous presentations related to the Computer Supported Cooperative Work (CSCW) projects within the Cooperation Systems department.

Research activities during the fellowship year were mainly performed in line with the TOTEM project efforts to develop easy-to-use authoring tools for creation and modification of mobile mixed reality games. The main goal of the project is to provide generic authoring tools to support the creation of arbitrary location-based games that do not have a specific pre-implemented game-logic. The generic tools consist of the TOTEM.Designer, which is a web-based tool allowing to conveniently edit and export the game data on the end user's computer at home, and the TOTEM.Scout, which is a mobile application running on Android phones and intended to collect game data directly on-site [1].

The fellowship started with implementation of Shape (templates) and Marble (templates filled with data) features into the TOTEM.Scout tool to support advanced data collection, management and synchronization with the TOTEM.Designer. Simultaneously, substantial research activities were performed in contributing to the design of the TOTEM.Designer's authoring components, namely Graphical User Interface (GUI), game logic and data export. This work focused on creating a user interface that enables presentation and manipulation of the underlying structured game data (Shapes/Marbles) in order to enable the end user to create some basic game logic functionalities. Further, the resulting structured data and game logic are exported as an MPEG .mp4 file that can be played back on the mobile device. Other export modes, such as JavaScript Object Notation (JSON), or Extensible Markup Language (XML) and Java classes for Android development, that do not include the game logic, are also possible.

In later stages it turned out that the TOTEM.Scout requires substantially bigger efforts in its development and thus, the research work mainly focused on integrating and implementing the required features within the TOTEM.Scout. It includes data presentation interface design improvements and implementation, as well as research for alternative libraries that could replace the Google Maps library and enable an offline map data usage on the mobile device in the case when mobile data connection is poor or not available at all. In addition to the traditional GPS localisation, new technologies, such as Near Field Communication (NFC) and WiFi Fingerprinting, have been integrated into the TOTEM.Scout and TOTEM.Designer.

At the end of the fellowship a user study for the TOTEM.Scout tool has been designed and executed with expert users. It focused on the process of data collection and evaluation the TOTEM.Scout application. The goal was to identify main problems in the application intended to be used as a creativity support tool for location-based application content collection in-situ. Two scenarios were devised for data collection: when the target application is available and content creators can access it and see how it works, and when only a description of the application is available, so content creator needs to imagine how it will work and how the GUI will look like. Currently, the results of the tests are being evaluated and processed, and will be transformed into a conference or workshop paper [2].



II – PUBLICATION(S) DURING YOUR FELLOWSHIP

[1]. R. Wetzel, L. Blum, A. Jurgelionis and L. Oppermann, **Shapes, Marbles and Pebbles: Template-based Content creation for location-Based Games**, IADIS International Conference Game and Entertainment Technologies, GET2012, Lisbon, Portugal, 18 - 20 July, 2012.

Abstract: This paper presents the TOTEM framework for supporting the content creation and structuring for location-based games. Shapes (templates), Marbles (instances) and Pebbles (raw data) build the conceptual background while two integrated tools support the overall workflow: TOTEM.Designer, a web-application that allows for desktop-based authoring and TOTEM.Scout, a mobile app that allows for in-situ authoring. The TOTEM framework supports different user roles and allows inexperienced users to collect and create content. All data can be exported and easily added to external games.

[2]. “A mobile tool for location-based content creation on-site” (writing in progress).

Abstract: This paper describes the TOTEM.Scout tool that has been developed for location-based data creation on-site. A user study performed with experts provides knowledge for future improvements in terms of user interface and tool’s functionality design, as well as addition of new features for data collection and management that necessary for the end users.

III – ATTENDED SEMINARS, WORKHOPS, CONFERENCES

1. Next Level Conference 2011, Cologne, Germany, 04-05 November, 2011
2. 3rd Workshop on Mobile Gaming (Moga 2011) at ACE & DIMEA 2011, Lisbon, Portugal, 8 November, 2011.
3. 1st ABCDE Seminar, Berlin, Germany, 10-11 November, 2011
4. WhereCamp 2012, Berlin, Germany, 22-23 June, 2012.
5. TOTEM Summer School Mobile Mixed Reality Game Jam Hackathon 2012 (as a member of the organizing team), Schloss Birlinghoven, Sankt Augustin, Germany, 23-27 July 2012.
6. Technologietag WLAN - Lokalisierung, Autarke Lokalisierung in Städten und Gebäuden, Schloss Birlinghoven, Sankt Augustin, Germany, 20 September, 2012.
7. 4th Workshop on Mobile Gaming (Moga 2012) at ICEC 2012, Bremen, Germany, 26 September, 2012.
8. 11th International Conference on Entertainment Computing (ICEC 2012), Bremen, Germany, 27-29 September, 2012.