Chapter 20
Personalized Active Cultural Heritage:
The PEACH Experience

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ABSTRACT

The development of intelligent guides for a museum is an important theme of research entailing a variety of challenging aspects. Intelligent guides are based on the idea that information presentation should take into account the context of the individual, in the first place the position of the visitor, but also other information that the system can infer about his background, interests and attitude during the visit, and tailor presentation of information accordingly. PEACH was a large project devoted to cultural heritage appreciation that combined aspects of basic research and applied research specific for the development of a complex prototype. The chapter provides a state of the art of intelligent museum guides, a presentation of PEACH and several of the involved technologies, and an assessment of some of the outstanding further challenges.

INTRODUCTION

PEACH–Personal Experience with Active Cultural Heritage—was a large four year project exploring novel technologies for physical museum visits. It was developed at IRST in Trento and DFKI, the German Institute for Research in Artificial Intelligence, in Saarbrücken.

The aim of the project was to significantly increase the quality of cultural heritage apprecia-

tion by investigating intelligent tools, or, more ambitiously, an environment, for making a visit to a museum a rewarding experience. The PEACH project ended in 2005, but its breadth in exploring the potential of intelligent systems in the museum and specific contributions to research on intelligent interfaces influence some current research. Among developments, it is at the basis of a new phase of research in the framework of a bilateral project between FBK-irst and University of Haifa.

This chapter is an overview of some of the main results of PEACH. It is meant to provide

a concrete idea of the outcome of this project, leaving out technical aspects, more appropriate for specialist communities. For the reader interested in further details we would like to refer to three comprehensive publications: a book (Stock and Zancanaro 2007) which includes all the themes of the project; a paper that focuses on one of the most ambitious and future-oriented themes – automated flexible production of documentaries (Callaway et al. 2005a); and the most complete PEACH paper on adaptive, intelligent presentation of information for the museum visitor (Stock et al. 2007).

A cultural visit is a blend of cognition, emotion, and social communication; perhaps it is the most central case of educational entertainment. The end goal is for people to enjoy the process of acquiring knowledge, to understand more about the past (and possibly about the present and the future), to appreciate art, and through this, to develop an interest for the site and, possibly, in general for a subject such as archeology, history or art. With the wide development of museums and the emergence of the cultural experience as a mass phenomenon, tools for museum communication have been introduced: labels illustrating exhibits, guidebooks, and guided tours. Following this, different forms of technology have been introduced such as audio material on cassettes and later CDs as well as visual material through various forms of kiosks, screens, or presentation rooms. In some museums, coarse-grained localization systems have been introduced as well that let the system automatically know what room the visitor is in, so that the presentation recorded for that room can be automatically selected.

For the sophisticated visitors, the museum visit is a complex experience that encompasses multiple cognitive and emotional aspects. They have personal ways of elaborating background and new knowledge, and they have different interests and preferences. Technologies to support such visitors are sometimes not yet ready for the mass market but represent an important research theme for information presentation technologies

(Stock and Zancanaro, 2005). Design requires effort in a number of aspects: the graphical interface and its usability, the adaptation mechanism and its effectiveness, and the overall satisfaction of the visitor. Moreover, technology designers need to consider the intrusiveness of the devices they propose for supporting visits. It should also be stated that, even if the museum world is very cautious about the introduction of technology on its physical premises, research is perceived as stimulating new concepts in the visit, and is looked upon with increasing attention and expectations.

Context-aware personalization of museum content is one of the key aspects to help each visitor accommodate and interpret the visit according to his/her own pace and interests. Adaptivity is generally defined as the capability of the system to tailor information presentation [Jameson 2003] according to user preferences and needs. Adaptivity of presentations to museum visitors may have various different possible aspects: a) it can impact the selection of static presentation, segments; b) it can impact specific aspects within presentation segments such as rhetorical aspects and cohesion with previously presented material; c) it can produce references to previous user's actions in the physical world, such as movements in the museum exhibits visited; d) it can establish the appropriate style of presentation (e.g. privileging facts/anecdotes/analysis); e) it can impact interface characteristics (e.g. interactivity level; "pushy" or neutral; balance between modalities such as image/text/speech). Adaptation can be guided by a variety of elements, the main ones being: an initial profile (explicitly provided or induced from the past); a dynamically induced model of user competence; a dynamically induced interest model; a dynamically induced visiting style or attitude; contextual issues like: time remaining, tiredness, crowdedness in museum areas; information about the state of other visiting party members and so on.

In PEACH, we investigated and implemented a suite of interactive and user-adaptive technologies for museum visitors. Many of these technologies

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