



## **Chapter XII**

# **Pervasive Game Design as an Architectural Teaching and Research Method**

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### **Abstract**

*Today and in the future, architectural students must be prepared for designing both physical and adaptive, computer-integrated, that is, “hybrid reality” spaces. The question is: How do we easily and effectively convey architecturally relevant theories and practices of pervasive computing in teaching? In this paper, we present an instructional model that is a possible answer. During a semester-long design class, we supervised an interdisciplinary group of architecture and computer science students who worked together on a serious pervasive game prototype, which we will refer to as “ETHGame.” The class culminated in a two-week intensive workshop and a presentation before school executives involved in strategic e-learning projects. The resulting interactive prototype takes advantage of our university’s extensive wireless local area network infrastructure (> 250 access points), allowing for player geo-positioning, location-based learning and servicing, as well as mediated communication. ETHGame transforms the school’s campus into a knowledge space, with key locations issuing position dependent and position relevant questions to players. ETHGame*

*involves participants in an academic quiz by the way of a given university place, rewarding them for collaborating both face-to-face and online. The game helps players build a collective academic and spatiotemporal identity whilst being immersed in a sentient environment. Thus, in this chapter we introduce serious pervasive game design as a novel design, research, and teaching paradigm for Computer Aided Architectural Design (CAAD), as well as an e-learning design strategy.*

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## Introduction

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Increasingly, information and knowledge technologies pervade our physical environments—they are being woven into the very fabric of everyday life. Objects, devices, services, and people that surround us as well as the spaces that we inhabit over time are becoming digitally and wirelessly networked. Furthermore, our activities are becoming mediated by these technologies, often in a location-based manner. For example, museums use location-based information to offer guided tours of exhibits; credit card purchases routinely record the location as well as other aspects of transactions; and cell phones and handheld computers find the nearest and strongest links for networking. This third wave of computing is commonly referred to as “pervasive computing,” and it deeply impacts how we design “sentient” spaces and resulting social situations now and in the future.

## Pervasive Computing and CAAD: Games as Teaching Methods and Results

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Architecture and Computer Aided Architectural Design (CAAD) in particular should reflect pervasive computing as a new field of interest through innovative research and teaching. We believe this field to be as important as other CAAD education cornerstones such as history, design, structure, or finance. In order to address this challenge, we have gathered a multidisciplinary team of architects, game designers, social anthropologists, and computer scientists at our chair. During the winter semester 2004/2005, this team has carried out a studio course culminating in an intensive two-week project together with 10 students of architecture and computer science, two women and eight men. The class has concerned the detailed conceptualization and prototypical design of a location-based “serious pervasive game,” which we will refer to as “ETHGame.”

Pervasive gaming integrates the technical approaches of computer gaming with emerging mobile interfaces, wireless and digital networks, and positioning technologies. By the way of this integration, game experiences are introduced that combine both virtual and physical game elements in computer-integrated environments (Figure 1). We define serious pervasive games as computer integrated games that conduce to purposes other than entertainment, for example, learning, security, building/environment administration, and management (<http://www.seriousgames.org>, 2005). In this kind of game scenario, players engage in an artificial conflict in a sentient, computer-integrated environment, resulting in a quantifiable outcome, which serves an end beyond the means of mere gameplay fun.

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