Chapter V

Using Multimedia and Virtual Reality for Web-Based Collaborative Learning on Multiple Platforms

Gavin McArdle, University College Dublin, Ireland

Teresa Monahan, University College Dublin, Ireland

Michela Bertolotto, University College Dublin, Ireland

Abstract

Since the advent of the Internet, educators have realised its potential as a medium for teaching. The term e-learning has been introduced to describe this Internet-based education. Although e-learning applications are popular, much research is now underway to improve the features they provide. For example, the addition of synchronous communication methods and multimedia is being studied. With the introduction of wireless networks, mobile devices are also being investigated as
a medium to present learning content. Currently, the use of 3-dimensional (3D) graphics is being explored for creating virtual learning environments online. Virtual reality (VR) is already being used in multiple disciplines for teaching various tasks. This chapter focuses on describing some VR systems, and also discusses the current state of e-learning on mobile devices. We also present the VR learning environment that we have developed, incorporating many of the techniques mentioned above for both desktop and mobile devices.

Inside Chapter

E-learning has become an established medium for delivering online courses. Its popularity is mainly due to the convenience and flexibility it provides for users, allowing them to learn without time or location restrictions. Many different e-learning systems are currently available, the majority of which are text-based and allow users to contact the course tutor via electronic mail or discussion forums. These courses essentially offer access to a common pool of resources that allow users to gain knowledge and often qualifications. Researchers are now exploring new ways of making the online learning experience more engaging and motivating for students. Multimedia and communication technologies are being added, and together with 3D graphics, are fast emerging as a means of creating an immersive online learning experience. With the advent of mobile technologies, m-learning is showing promise as an accompaniment to online courses, offering the prospect of a modern and pervasive learning environment.

This chapter discusses the benefits 3D environments offer the e-learning community. We outline how this type of system emerged and describe some currently available systems using these new technologies. In particular, we describe in detail our own virtual reality environment for online learning and the features it provides. We discuss the extension of this system to a mobile platform so that users have anytime, anywhere access to course materials. Finally, we put forward some thoughts on future technologies and discuss their possible contribution to the development of a truly ubiquitous and pervasive learning environment.

Introduction

Distance learning has gone through a number of iterations since its introduction in the 1800s. The notion of distance learning grew mainly out of necessity, and helped to overcome geographical, economical, and cultural barriers that prevented people
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