Chapter 5.6
Fear of Flying and Virtual Environments:
An Introductory Review

Giovanni Vincenti
Gruppo Vincenti S.r.l., Italy

ABSTRACT

Fear of flying is a common problem that many people have to face. As varied as the causes may be, all kinds of fears have many aspects in common. Much is known to us about fear, and the fields of psychology and psychiatry teach us that many times we can conquer fears simply by exposing the subject to the dreaded object. Human-Computer Interaction has branched even in this direction, including the treatment of phobias. With the help of Virtual Reality researchers around the world have recreated using a computer the way that psychologists and psychiatrists cure fears, adding a twist. Many times patients are supposed to go the extra mile and expose themselves, little by little, to what they are afraid of. Virtual Reality brings this type of exposure directly to the patient, with the comfort that such fear can be stopped at any time, since it is only a computer simulation. The most successful studies have been performed on arachnophobia, or the fear of spiders. There are also studies that deal with the fear of heights and the fear of public speaking. Some studies have also been performed on addressing the fear of flying using a virtual environment. This work is a review of such methods, and an explanation of the principles behind the motivation for these studies.

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INTRODUCTION

Computers play a significant role in most aspects of our lives nowadays. We use computers when

we drive to work, they help us perform our jobs better and more accurately, and sometimes they even help us fall in love by letting us talk to old friends and make new ones through chat programs. Some people share their whole lives on a computer, recording nearly every move they make on a web log, an on-line diary (Wijnia, 2005).

As this invention takes more of a dominant part in our lives, we adapt more and more to having this powerful tool around. Especially, children are growing up using computers as their teachers, playgrounds and friends (Subrahmanyam et al., 2000). The same computers help our lives not only in health, but also when we are sick. Computers help hospitals keep track of patients, but they are also used as a diagnostic tool, allowing doctors to reach conclusions on tough cases or request the help of colleagues located on the other side of the world (Shortliffe et al., 2001). In these cases, computers serve as passive tools that increase the quality of work.

Human-Computer Interaction

The field of Human-Computer Interaction (HCI) is a rather new addition to the world of computer science. The potential that HCI has is great, when we explore in a bit more detail all the applications and repercussions that these concepts bring to the world of computing (Shneiderman, 1998). The branch of HCI that deals with "Direct Manipulation and Virtual Environments', as discussed in Shneiderman (1998), is most relevant to this discussion. Virtual Environments (VE) and Virtual Reality (VR) are closely tied with informatics applied to the fields of medicine and psychology. Hodges et al. (2001) report that some of the applications of VR that are more widely used are the ones that interact with "humans' cognitive and physical (manipulation) aspects", besides its application to entertainment. If we apply these concepts to medical informatics, the role of computers towards patients becomes more active.

Hodges et al. (2001) explore the application of VR to curing psychological and physical disorders, such as fears. This team of researchers applied concepts of HCI to the treatment of patients who suffer of many types of phobias, such as fear of height, or acrophobia, fear of spiders, or arachnophobia, and fear of public speaking. In this chapter we will explore a few, but we will concentrate especially on the fear of flying.

VIRTUAL REALITY AND VIRTUAL ENVIRONMENTS

Anyone who has created a program to supply the demands of a customer knows about scope creep. When the project starts, the future users usually list an endless sequence of features they would like to see included in their new work tool. As they test the application, they say that it would be nice if this program could also do this or if it could do that. Scope creep does not only mean that users are asking for more, it also means that programmers will have to provide greater functionality. This very concept is the driving motor that pushed developers to create programs that users could not only observe, but could interact with at multiple levels.

Although the distinction between VR and VE is not well agreed-upon, most resources seem to point to the idea that VR is the field that addresses the creation of VEs that make users believe they are immersed in real environments. Shneiderman (1998) introduces the concepts of VR and VE using an example that is extremely effective. As a team of people start the creation of a building, the people who are commissioning such work will get a good idea of what things will look like from the sketches and diagrams. Should the same drawings be reproduced on a computer screen, they will get a much more vivid representation of what is going to be built.

An even more realistic representation would come from substituting a projector to the computer