Caught Between Real and Virtual Worlds

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This chapter describes how we, as HCI practitioners, contributed to the design of a collaborative virtual environment-based simulator. This simulator is to be used by senior maritime professionals to practice and acquire safety-critical skills through simulated training. In the course of this work we encountered a number of unanticipated design and evaluation challenges beyond “simple” usability, though, of course, evaluating the usability of virtual environments is far from simple. The first of these challenges, or tensions, involved the need to exploit the power and possibilities of a collaborative virtual environment to the full against the need to maintain the fidelity of the modelled environment. The second challenge is more subtle, given that a virtual environment can only be an approximation to reality, how approximate should it be, or “how real is real?”.

The Challenge: Can Virtual Systems Solve Real Problems?

The focus of the HCI intervention described in this chapter was the DISCOVER project. This project comprised a tight, well focused consortium of end-users and software developers and had as its aim the development, deployment and evaluation of a collaborative virtual environment (CVE)-based training environment. The rationale for the project was essentially two-fold: first, there is a well established need to train senior professionals in the maritime and offshore sectors in the management of safety-critical situations. Here we are referring to high-level command and control skills rather than, say, fire fighting. Second, training at present is very costly and
reducing costs is, unsurprisingly, popular with all concerned. Current training requires the senior professionals to attend courses delivered at a specialist training site for up to a week with all of the cost associated with being away from work. Despite this inconvenience it is clear that those involved take the training very seriously and it is not unusual for them to give up holidays to attend specific courses.

At the end of 1999, the project, which is supported by the European Commission, was reallocated from a “technology” section of the Commission to one which had a different focus and philosophy, namely a strong emphasis on user involvement and “user friendliness”. This new section insisted that the intended end-users of the DISCOVER be placed at the centre of the development process. As a result the project was presented with a short deadline in which to take the necessary remedial action. The Commission suggested that they recruit a partner with expertise in this domain to help. We (the authors) were invited as HCI practitioners to “fix the problem”.

### The DISCOVER Vision

The DISCOVER “vision” was to provide trainers and trainees with the opportunity to train and practice their safety-critical and command and control skills at their place of work whether it be at sea or on an oil platform. DISCOVER will deliver this training by way of a collaborative virtual environment running over the Internet. The overall DISCOVER system comprises a web-based training administration system where a trainee can register, review their progress and launch either theory based modules or the CVE itself. The project envisages a trainee logging into the administration system, and then brushing up on their command and control skills in the theory module area before practising those skills on line by entering the CVE. The CVE may be running on the ship’s own network, or be hosted on shore or also be running in a truly distributed fashion across the trainee’s organization or the wider world. Needless to say this is quite ambitious.

### Our Brief: “Develop a Highly Usable VR System – and Do It Yesterday!”

The project had identified a number of key areas which needed specialist attention. These were to: