Prototype HCI Experiment Framework Driving Simulator

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Abstract

In this paper I discuss the practical issues involved in the creation of visual simulation applications, specifically an experimental driving simulator. Driving simulations are widely used for research, product development, safety, human interface design, and entertainment. The primary purpose of a visual simulation application (as compared with a non-visual simulation application) is to make the visual component of the simulated activity as perfect as possible so as to accurately reproduce the actual experience. The general process of simulation design can be roughly divided into three areas: Interface (controls, instrumentation, overall appearance), Hardware (image generator computer systems / video cards), and Software (simulation algorithms and I/O). I discuss each of these in turn, but focus on the second two areas, with particular emphasis on the third (software design), covering the basic elements and some of the software tools available to simplify the process. I also cover some practical considerations such as time and cost, and include some simplified code examples. In the last part I discuss the details involved in the creation of a simple driving simulator for use in a prototype HCI study, including the purpose/rationale for the study, the study design, and some technical considerations related to HCI research.