

A Proposed Design Framework for Fixed-Base Driving Simulators Using Concepts of Software Component-based Design*

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Abstract

Driving simulators are valuable research tool for conducting driving studies instead of conducting these studies on the real roads. However, to be accepted as a representative of the real world, a driving simulator must provide an acceptable degree of realism. It is always a goal of the designers of driving simulators to increase their degree of realism as possible. However, increasing the realism of a driving simulator leads to increasing its cost beyond the allocated cost. So it is common to build a driving simulator initially with an acceptable degree of realism and then have it undergo continuous changes to increase its realism whenever there is a chance to do so. The objective of this paper is to present a modular design of the software components of a fixed-base driving simulator. By following this design, it is possible to start building a simulator with a degree of realism that can continually be increased by improving each of the software components alone without the need to radically change other components of the simulator. This design also helps to build economical alternatives while conducting a study on a simulator and to collect the experiment data by providing specialized software components for these tasks.

Keywords: Driving Simulators, Virtual Environments, Software Component Design

* * For the paper in Arabic see pages (13-28)

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