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## Preface

Scene modeling is a very important part in Computer Graphics because it allows creating more or less complex models to be rendered, coming from the real world or from the designer's imagination. However, scene modeling is a very difficult task, as there is a need of more and more complex scenes and traditional geometric modelers are not well adapted to computer aided design. Even if traditional scene modelers offer very interesting tools to facilitate the designer's work, they suffer from a very important drawback, the lack of flexibility, which does not authorize the designer to use incomplete or imprecise descriptions, in order to express his (her) mental image of the scene to be designed. Thus, with most of the current geometric modelers the user must have a quite precise idea of the scene to design before using the modeler to achieve the modeling task. This kind of design is not really a computer aided one, because the main creative ideas have been elaborated without any help of the modeler.

Declarative scene modeling could be an interesting alternative to traditional geometric modeling. Indeed, declarative scene modeling tries to give intuitive solutions to the scene modeling problem by using Artificial Intelligence techniques which allow the user to describe high level properties of a scene and the modeler to give all the solutions corresponding to imprecise properties.

No matter if a scene modeler is declarative or a classical geometric one, it is usually not enough to help the user in the designing process. The designer has not always to start from nothing and to design a new scene. Scene data bases, or scene knowledge bases in the case of declarative modeling, should be associated to the scene modeler, in order to allow the designer to use and/or to modify existing models during the designing process. Moreover, easy access to Internet, together with appropriate tools, should be available for the user, allowing, for example, collaborative scene modeling. In other words, scene modeling tools should be complete information systems, that is *scene modeling information systems*.

This book is dedicated to *intelligent scene modeling information systems*, that is information systems using Artificial Intelligence techniques to design scenes. Declarative scene modeling techniques are presented, as well as their implementation in an intelligent information system.

In order to improve efficiency of declarative modeling based scene modeling information systems, various techniques are proposed in the book: coupling of a de-

clarative modeler with a classical geometric modeler. Use of machine-learning Artificial Intelligent techniques, allowing the system to learn the user preferences; introduction of high level concepts, especially the concept of “style” in architectural design; introduction of collaborative declarative modeling techniques.

The last chapter is dedicated to the web security problem, as an intelligent scene modeling information system must be able to work in open environments. Artificial Intelligence techniques, as well as information visualization techniques, are proposed to easily detect web attacks.

Intelligent scene modeling information systems may reduce the complexity of scene modeling, by using well adapted Artificial Intelligence techniques, together with a lot of libraries and other tools, allowing easy description, search or modification of scenes. The use of declarative modeling techniques in the heart of such systems was experimented and seems to give interesting results, even if these techniques have to be still improved.

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Intelligent Scene Modelling Information Systems

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2009, XII, 216 p. 113 illus., 10 illus. in color., Hardcover

ISBN: 978-3-540-92901-7