



Virtual Reality Technology

Second Edition

Virtual reality is a very powerful and compelling computer application by which humans interact with computer-generated environments in a way that mimics real life and engages various senses. Although its most widely known application is in the entertainment industry, the real promise of virtual reality lies in such fields as medicine, engineering, oil exploration, and the military, to name just a few. Through virtual reality, scientists can triple the rate of oil discovery, pilots can dogfight numerically superior "bandits," and surgeons can improve their skills on virtual (rather than real) patients.

This *Second Edition* of the first comprehensive technical book on the subject of virtual reality provides updated and expanded coverage of the technology such as:

- ♦ Input and output interfaces including touch and force feedback
- ♦ Computing architecture (with emphasis on the rendering pipeline and task distribution)
- ♦ Object modeling (including physical and behavioral aspects)
- ♦ Programming for virtual reality (WorldToolKit, Java 3D, GHOST, and

PeopleShop)

- ♦ An in-depth look at human factors issues, user performance, and sensorial conflict aspects of VR
- ♦ Traditional and emerging VR applications

Virtual Reality Technology, Second Edition is specifically designed for use as a textbook. Thus it includes definitions, review questions, and a CD-ROM with video clips that reinforce the topics covered. The CD-ROM also contains a Laboratory Manual with homework and programming assignments in VRML and Java 3D, as follows:

- ♦ Introduction to VRML & Java 3D
- ♦ Sensor and Event Processing
- ♦ VRML and Java Script
- ♦ Scene Hierarchy, Geometry and Texture.
- ♦ VRML PROTO and Glove Devices
- ♦ Viewpoint Control, Sound and Haptic Effects

The *Second Edition* serves as a state-of-the-art resource for both undergraduate and graduate students in engineering, computer science, and other disciplines. Instructors using this book for their courses will find the *companion website* (www.vrtechnology.org) very useful. The website gives adopting instructors access to updated class notes, supplemental videos, book figures, exam solutions, and sample student programming projects.

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