

# Preface

Virtual Reality has the potential to provide descriptive and practical information for medical training and therapy while relieving the patient or the physician. Multimodal interactions between the user and the virtual environment facilitate the generation of high-fidelity sensory impressions, by using not only visual and auditory, but also kinesthetic, tactile, and even olfactory feedback modalities. On the basis of the existing physiological constraints, this book derives the technical requirements and design principles of multimodal input devices, displays, and rendering techniques. Several examples are presented that are currently being developed or already applied for surgical training, intra-operative augmentation, and rehabilitation.

This book resulted from the lecture notes of the course Virtual Reality in Medicine, which has been taught and further developed at ETH Zurich, Switzerland, since 2003. It is well suited as introductory material for engineering and computer science students as well as researchers who want to learn more about basic technologies in the area of virtual reality applied to medicine. It also provides a broad overview to non-engineering students as well as clinical users, who desire to learn more about the current state of the art and future applications of this technology.

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