

PREFACE

For many patients, the real world is too risky or disconcerting for them to move around in. The agoraphobic patient has a fear of open or public places and so may become housebound. The psychiatric technique of desensitization has been in use for a number of years. The patient is asked to imagine the things that are most disturbing and gradually their fears are controlled. Now a virtual environment can be created for treatment of these patients. They can gradually experience their feared objects in a manner with complete control. Similarly, people who need rehabilitation from weakness or loss of body function or control can have a custom environment created for them that will represent an appropriate challenge to help them recover.

Delivery of medical care has been progressively hampered by the lack of ability to provide specialized information uniformly to all people. Specialists tend to be located in university, urban centers that are distant from many patients and their primary care physicians. With the explosion of understanding of many diseases, the primary care physician will need more and more access to agents able to understand and synthesize information about patients.

Beyond telemedicine, telesurgery has been touted as a means of getting surgeon to a remote location and allowing him to operate on his patient. Since there are many surgeons, this application of telepresence will only be useful in places that doctors are not willing to go, such as the battlefield. However, there are remote locations that no surgeon is currently able to go; microscopic sites inside the body. Surgeons now manipulate blood vessels inside the eye or bones in the middle ear. However, at current size, even when viewed through the best microscope, the VRT can also be used in the areas of physical disabilities. Virtual environments can be created for the treatment of the patients with the motor disturbances such as parases. The speech disabilities can be assisted by simply using the data gloves which translate the gestures into spoken words.

In this volume, we will discuss the use of information technologies in the rehabilitation, treatment of physical disabilities in details and the delivery of health care using the information technologies.

The first chapter by W. J. Greenleaf summarizes the current status of the virtual reality technologies and discusses the use of these technologies in neuro/orthopedic rehabilitation as well as the new systems under development.

The second chapter by B. K. Wiederhold and M. D. Wiederhold gives the use of virtual reality technologies for the treatment of many anxiety disorders including fear of heights, flying, spiders, driving, social phobia, and the possi-

bility of using these technologies for the treatment of acute stress disorders and generalized anxiety disorders.

The third chapter by L. Beolchi and G. Riva gives an indepth summary of virtual reality technoloigoies and their applications in health care as well as the healt care market analysis.

The fourth chapter by Das et al. presents the recently developed RAM tele-robot system and its demonstration of a simulated microsurgery procedure performed at the JPL.

The fifth chapter by Viirre et al. discusses motion sickness caused by the virtual reality technology and the application of VR for vestibular patients.

The sixth chapter by Guo et al. introduces a telemedicine diagnosis support systems based on the computer graphics and multimedia technologies.

The seventh chapter by J. Wang presents the implementation of a picture-achieving and comunication system (PACS) and teleradiology system by emphasizing the practical issues in the implementation of a clinical PACS.

The eighth chapter by Stone discusses the adoption of virtual reality technologies in medicine and other sectors and presents a case study of one surgical training system.

The last chapter by Sarti et al. discusses a simulation method that allows one to deal with extremely complex anatomical geometrics and gives a detailed comparison between virtual and real surgical opertions performed on patients.

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