Virtual reality and persons with disabilities

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ABSTRACT

There are many exciting developments in the field of virtual reality. This presentation will use slides and videotapes to demonstrate three important applications of the technologies of virtual reality: one with people with movement disorders, another with people who experience height anxiety, and a third that deals with the treatment of injuries on the battlefield. More people in the field of disability need to become involved in the potential of virtual reality. Conferences such as this one play an important role in stimulating ideas that may result in more applications.

Keywords: overview, movement disorder, anxiety, injury, Center on Disabilities (CSUN)

1. INTRODUCTION

The CENTER ON DISABILITIES at California State University, Northridge (CSUN) has three major functions: (1) provide leadership to the Office of Disabled Student Services at the university, where 700 students with disabilities are assisted with educational support services such as counseling and tutoring; provide training to students with disabilities in assistive technologies which will assist them in their university studies, prepare them for employment, and help them live independently, (2) conduct major international conferences in the area of technology and disability, and (3) engage in a variety of grants and contracts such as our current training program, "Leadership and Technology Management," (LTM).

As many of you know, the CENTER ON DISABILITIES conducts the largest, annual, international conference of its kind in the world, "Technology and Persons with Disabilities," each March in Los Angeles. This conference deals with many issues in the area of technology and disability. We try to keep a focus on new and emerging technologies to bring these to the attention of our field, and to advocate for their use among people with disabilities. This conference brings more than 2,000 people each year to Los Angeles from almost every state and 25 foreign countries. There are about 150 exhibitors, and 300 speakers at this conference.

In 1991, the conference keynote speaker, Ted Saenger, President and CEO of Pacific Telesis, the large phone company on the west coast of the United States, spoke on "Virtuality." In broad terms, Mr. Saenger addressed the issue of virtual environments including the virtual corporation and the virtual office, and the power of telecommuting for individuals with disabilities. He also whetted our appetite for virtual reality: three dimensional, interactive, computer generated worlds. It was clear that virtual reality had great potential for training, as well as other applications, to assist people with disabilities.

2. THE VIRTUAL REALITY FIELD BECOMES INTERESTED IN DISABILITY; THE DISABILITY FIELD BECOMES INTERESTED IN VIRTUAL REALITY

At about the same time that Ted Saenger spoke to us on "Virtuality," we had contacted Jaron Lanier, who is credited with coining the term, "Virtual Reality." Lanier at that time was chief scientist with VPL in Redwood City, California. We booked Lanier as keynote speaker for our 1992 conference, "Technology and Persons with Disabilities," and invited him to bring virtual reality equipment (input glove, head mounted display, hardware and software) to the conference to demonstrate virtual reality to our participants.

Lanier did so to the great interest of the field of technology and disability. It become clear to us that we had identified a major developing technology. We assumed the obligation to follow this technology and keep its potential before the field.

To this end, we developed a separate conference devoted entirely to virtual reality and disability. This conference has been conducted in 1993, 1994, and 1995 in San Francisco. Keynote speakers have included Brenda Premo, Director, California State Department of Rehabilitation, Ray Bradbury, the famous science-fiction writer, and once again, Jaron Lanier. Attendees from the virtual reality field, and the disability field, have had the opportunity to mingle, discuss applications, and share ideas of what the future might hold for persons with disabilities.

The objectives of the separate conference,"Virtual Reality and Persons with Disabilities," are:

(1) engage the virtual reality field in disability issues; engage the disability field in the new technologies of virtual reality

(2) encourage new applications and provide a forum for dissemination of information

(3) engage the international community

3. PARTICIPATION OF THE INTERNATIONAL COMMUNITY

The CENTER ON DISABILITIES is very active in the international community. Participants from about 25 foreign countries participate in the conference, "Technology and Persons with Disabilities," and participants from about a dozen countries participated in our most recent "Virtual Reality and Persons with Disabilities" conference. I have keynoted conferences in six or seven countries and have provided technical assistance in Sweden and England to those wishing to develop "Virtual Reality and Person with Disabilities" conferences of their own. We strongly encourage our friends around the world to become more engaged in assistive technology (including virtual reality) field through conferences, research, and demonstration projects.

4. INTERESTING DEVELOPMENTS IN VIRTUAL REALITY AND DISABILITY

The major part of this presentation will be conducted through the showing of videotapes of leading applications. Several that are worthy of mention include:

(1) Suzanne Weghorst of the University of Washington. Dr. Weghorst has worked with people with movement disorders, such as Parkinson's Disease. She has developed a computer-generated world that trains a person to walk in relation to virtual objects. As you will see on the videotape, the training effect results in dramatic improvement.

(2) Ralph Lamson of Kaiser Hospital. Dr. Lamson has worked with people who fear heights. His computer-generated worlds provide training in incremental increases in distances. He has demonstrated reduction of fear through blood pressure and heart rate measures.

(3) Richard Satava of Walter Reed Hospital. Dr. Satava is a Colonel in the U. S. Army and a surgeon. His work includes a project in telepresence and will be shown in the videotape, "Modern Medical Battlefield." Through television and robotics, paramedics on site, and a surgeon at a remote location, can communicate and intervene in order to treat a wounded soldier at a battlefield location.

5. SUMMARY

There are many exciting developments in the field of virtual reality. Applications in the field of disability are at an early stage. Most of the applications have been developed with "off the shelf" technologies, and minimal specialized programming. More people in the field of disability need to become involved in the potential of virtual reality. Conferences such as this one play an important role in stimulating ideas that may result in more applications.