



Medicine Meets Virtual Reality: 4

Health Care in the Information Age:
Future Tools for
Transforming Medicine

January 17-20, 1996
San Diego, California

Program

MMVR:4

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Health Care in the Information Age: Future Tools for Transforming Medicine

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San Diego, California

Sponsored by: UCSD School of Medicine

In Cooperation With:

Advanced Research Projects Agency (ARPA)

American Psychiatric Association (APA)

Institute for Telemedicine, Center for the New West

Institute for Interventional Informatics

Laboratory for Biological Informatics and Theoretical Medicine/UCSD

Pacific Bell Health Care Market Group

Society of Computer Simulation (SCM)

Society for Minimally Invasive Surgery (SMIT)

Society of American Gastrointestinal Endoscopic Surgeons (SAGES)

Society of Cardiovascular and Interventional Radiology (SCVIR)

Virtual Environment and Teleoperator Research Consortium/MIT (VETREC)

ACKNOWLEDGEMENT

The Conference Organizers express gratitude to the following for their contribution and participation in Medicine Meets Virtual Reality:4

AT&T has provided sponsorship for our Thursday evening Reception in *The Bridge*

AVS, Inc., has provided a computer for *The Bridge*

Bay Systems has provided computer equipment for use in *The Bridge*

Circon has provided telemedicine tools for use in *The Bridge*

CLI Compression Labs, Inc., has provided teleconferencing equipment

East Carolina University School of Medicine has provided technology and support services to create *The Bridge*

Ethicon Endo-Surgery and the Society of Gastrointestinal Endoscopic Surgeons have made possible our Invited Lecture by Mr. Alexander Tsiaras

HealthInfo has participated in supporting *The Bridge*

Med Vision, Inc., has provided computers in *The Bridge*

QD Technology has provided stereo multiplexers

Silicon Graphics Computer Systems has provided several computer systems for use in the Exhibit Hall and by our presenters

Sun Microsystems, Inc. has provided workstations for email and WWW access

United States Surgical Corporation has sponsored the printing of this program

V TEL has provided a teleconferencing system

Virtual Reality South has provided stereo vision systems for use in *The Bridge*

Welch Allyn, Inc., has provided instrumentation in *The Bridge*

THANK YOU!

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Scripps Clinic & Research Fdn

VIRTUAL REALITY and MENTAL HEALTH

Wednesday, January 17 Hyatt Regency San Diego, Regency A/B, 4th Floor

0845 to 1700

Sponsored by: Virtual Environments and Teleoperator Research Consortium (VETREC)/MIT
Laboratory for Biological Informatics and
Theoretical Medicine/UCSD

In Cooperation with: American Psychiatric Association

Co-Chairs: Nathaniel I. Durlach, Ian Alger MD

Participants include: Rita Addison MA, Lee Baer PhD, Sandra L. Calvert, PhD, Kalman Glantz PhD, Roger L. Gould MD, Walter J. Greenleaf PhD, Richard Haier PhD, John Hestenes PhD, Larry F. Hodges PhD, Ralph Lamson PhD, Max M. North PhD, Giuseppe Riva MD, Dr rer nat Hans B. Sieburg, Dorothy C. Strickland PhD, Erik Viire MD, PhD, Suzanne J. Weghorst, Paul Zimnik DO

The principal focus will be the use of Virtual Reality technology in the diagnosis and treatment of mental disorders. Secondary foci include: the use of VR in providing diagnosis and treatment remotely (teletherapy), the use of VR in basic research on brain function, and the extent to which various types of VR experiences in various types of application domains are likely to result in unanticipated and undesired "side effects". The conference will include formal presentations as well as discussion involving audience participation with invited panelists.

0845	Introductory Remarks	Ian Alger MD, Nathaniel I. Durlach
0905	Virtual Reality Exposure in the Treatment of Fear of Flying	Larry F. Hodges PhD, Barbara O. Rothbaum PhD, Benjamin A. Watson MS, G. Drew Kessler MS, Dan Opdyke PhD
0924	The Use of Virtual Reality Technology in the Treatment of Psychological Disorders	Max M. North PhD, Sarah M. North MS, Joseph R. Coble PhD
0943	Virtual Reality and Body Image: New Perspective for Eating Disorder Treatment	Giuseppe Riva MD
1002	Therapeutic Augmented Reality	Suzanne J. Weghorst
1021	Clinical Application of Virtual Therapy to Psychiatric Disorders	Ralph Lamson PhD
1040	Break	

1050	Virtual and Other Realities <i>Ian Alger MD</i>
1109	Virtual Reality and Psychotherapy: Opportunities and Challenges <i>Kalman Glantz PhD, Nathaniel I. Durlach, Rosalind C. Barnett PhD, Walter A. Aviles</i>
1128	Psychology, Functional Brain Imaging, and Virtual Environments <i>Richard J. Haier PhD</i>
1147	Measurement of Brain Activity in a Virtual Environment <i>Dorothy C. Strickland PhD</i>
1206	Virtual Reality: A New Way to Design Neuroperceptual Tools <i>Rita Addison MA</i>
1225	Break
1335	Neurology and Virtual Reality: Effects of VR on the Nervous System of Users <i>Erik Viirre MD, PhD</i>
1354	The Impact of VR on Young Adults' Aggressive Behavior and Physiological Arousal <i>Sandra L. Calvert PhD</i>
1413	A Telephone Interface for Simulated Behavior Therapy of an Anxiety Disorder <i>Lee Baer PhD</i>
1432	Behavior Modification <i>in Silico</i> <i>Dr. rer nat Hans B. Sieburg, Jason Rogers</i>
1451	The National Consortium of Telepsychiatry <i>Paul R. Zimnik DO</i>
1510	Break
1520	Panel Discussion with Audience Participation <i>Panelists include: Warren Brodey MD, Roger L. Gould MD, Walter J. Greenleaf PhD, John Hestenes PhD</i>
1700	Adjourn

UPDATE: ADVANCED BIOMEDICAL TECHNOLOGY PROGRAM

Wednesday, January 17 Hyatt Regency San Diego, Manchester I, 2nd Floor

1300 to 1700

Sponsored by: Advanced Research Projects Agency (ARPA)

Chair: Col. Richard M Satava, MD

Principal Investigators of the Advanced Biomedical Technology Program (ABMT) will present updates on the progress of their contribution to the overall Program effort. The discussion will center on integration of the projects into a seamless, interoperable system focused on military casualty care in the battlefield. Three areas: remote diagnostics, remote therapy, and virtual reality for medical training and simulation will be addressed. The purpose is to identify Program weaknesses, deficiencies, and need for additional efforts.

The ABMT workshop is a working group discussion that will provide participants with an opportunity to learn about leading edge technologies and projects currently underway.

Discussion includes:

1. Input Devices - how they will enable virtual environments

Sarcos - *I-port* • BDI - *haptic interface* • Artificial Reality - *olfaction* • UCSD - *bodysuit*
NRaD - *sensate liner* • SM&E - *sensate liner*

2. Displays - what are the best displays for training in virtual environments

SRI - *surgical console* • Dimensional Media - *holography* • HIT Lab - *VRD and ubiquitous*
UCSD - *medical education curricula* • IDA - *task analysis*

3. Virtual Environments

a) Virtual cadaver

Musculo-Graphics • High Techsplinations • Mission Research • Ninewells Hospital

b) Medical Forces planning and training

Naval Postgraduate School • Sandia National Labs • U. Pennsylvania

c) Virtual prototyping

J&J Ethicon - *OR of the Future* • MIT - *OR of the Future*
Northrup Grumman - *LSTAT* • Foster Miller - *MEDFAST*

IMAGING AND VISUALIZATION: NEW TOOLS FOR DIAGNOSIS & THERAPY

Wednesday, January 17 Hyatt Regency San Diego, Regency D/E, 4th Floor

In Cooperation With: Society of Cardiovascular & Interventional Radiology

Co-chairs: Giovanna Casola MD & Steven L. Dawson MD

Moderator:	Steven L. Dawson MD
1300	Welcome and Introduction. Faina Shtern MD
1305	Low-End Interactive Image-Directed Neurosurgery: Update on Rudimentary Virtual Reality Used in Epilepsy Surgery <i>Werner K. Doyle MD</i>
1325	The Virtual Aneurysm: VR in Endovascular Therapy <i>Michael R. Harreld MS</i>
1345	Initial Clinical Experience with an Interactive Volume Sonography Visualization System <i>Thomas R. Nelson PhD</i>
1405	Applied Virtual Reality for Simulation of Endoscopic Retrograde Cholangio-Pancreatography (ERCP) <i>John W. Peifer MA</i>
1425	Cranial Base Tumor Visualization through High Performance Computing: An Aide to Diagnosis and Treatment <i>Gregory J. Wiet MD</i>
1445	Dexterity Enhancement and Image Guided Therapy: Update on Animal and Clinical Trials <i>Steven T. Charles MD</i>
1505	Discussion
1515	Break
Moderator:	Faina Shtern MD
1530	Virtual Environments Technology to Aid Needle Biopsies of the Breast: An Example of Real-Time Data Fusion <i>Henry Fuchs PhD</i>
1550	Preliminary Clinical Experience with the Cyberknife: Image-Guided Stereotactic Radiosurgery <i>John R. Adler Jr, MD</i>
1610	3D Tomographic Guidance Techniques for Micro Endoscopic Procedures <i>Dietrich H. W. Grönemeyer MD</i>
1630	MRI Approach to the Spinal Canal <i>Rainer M. M. Seibel MD</i>
1650	Radiology in the Information Age: Perspectives from the National Cancer Institute <i>Faina Shtern MD</i>
1710	Discussion
1730	Adjourn

THE BRIDGE

Thursday & Friday, January 18 & 19 Hyatt Regency San Diego, 4th Floor
1000 to 1700

Participating Organizations:

Institute for Interventional Informatics

East Carolina University School of Medicine

Northeastern Parallel Architectures Center/Syracuse University

SUNY Syracuse Health Science Center

San Diego State University College of Sciences

Human Interface Technology Lab/University of Washington

Scripps Memorial Hospital

Human Performance Institute/Loma Linda University Medical Center

Chair: Dave Warner MD, David C. Balch MA

The Bridge is an intelligent electronic triage site (the telemedicine command center) between the point of need (care portal) and the point of service (DOCKing station). That is... The Bridge is an intelligent, connected, medical communications system devoted to the optimal (geographically-independent) distribution of medical intelligence.

The Bridge at MMVR4 will demonstrate a scaled version of a diverse networked environment which addresses the need for integrated medical communications system. The Bridge will be a real-time physical event featuring the home, the hospital, the rural clinic and other remote facilities with restricted access and their connection to a wide array of health care providers.

The Bridge will be open Thursday and Friday of the conference. A reception will be held in the Bridge Thursday evening, 1830 to 1930.

POSTER/VIDEO PRESENTATIONS

THURSDAY & FRIDAY, January 18 & 19 Hyatt Regency San Diego

Computer Aided Locoregional Assessment of Soft Tissue Sarcoma and 3D Simulator Surgery

C. Di Somma

Tactile Optical Sensor for Use in Minimally Invasive Surgery

Harald Fischer Dipl-Ing

Simplified Access to Medical Resources on the Internet: How to Get Clinicians on the Web

Subhas Gupta MD

Introduction of New Telemedicine Applications into Ophthalmic Practice: Standardized Evaluation of Technology

Subhas Gupta MD

Breast Cancer Lighthouse CD-ROM: Using Personal Stories for Patient and Clinician Education

Carrie Heeter PhD

Computer Simulation of the Birth Process

Yanxi Liu PhD

Computer-Based Surgical Education: Results of a Study in Denmark

Mikkel Pedersbaek

A Clinical Field Study in Laparoscopic Application

Cletus vonPichler Dipl-Ing

Project Evolution of a Virtual Reality Microsurgical Simulator

Roberto Puzone MD

DISOS - A Desktop Image Processing System for Computer Assisted Orthopedic Surgery

Cletus vonPichler Dipl-Ing

PIXEL: Experiences with the Elements

Claudia Reiche MA

Stereoscopic Visualization System for Clinical Angiography

Ryuzo Sekiguchi MD

Battlefield Medicine Education & Training: Transitioning the Human Factors from Reality to Virtual Reality

Annette L. Sobel MD, MS

Human Body Textbook with 3D Illustration

Tamoyuki Umehara

Computational Visualization of Cardiovascular Blood Flow

Takami Yamaguchi MD, PhD

Virtual Computer Monitor For Visually Impaired Users: Project Description and Status

Arthur L. Zwern MBA

PROGRAM

THURSDAY January 18, 1996 San Diego Convention Center

Third Floor Rooms 6C - 6F

Technology Assessment: Will It Work? Is It Better? Will It Be Paid?

Moderator: Ralph E. Holmes MD

0745 Welcome & Introduction. Col. Richard M. Satava MD

0800 Usability Testing: Critical to Medical Product Development
Clarence A. Semple

0820 Integrated Medical Environments: Magnifying the Healing Power of Information
Matthew E. Hanson MSAE, MBA

0840 Virtual Reality: From Training Systems to Designing a Simulator for a Health Care Delivery System
Joseph M. Rosen MD

0900 Medical Virtual Reality: The Current Status of the Future
Col. Richard M. Satava MD

0920 Discussion

0930 Break/Exhibits Open

Surgery: Tools for Minimally Invasive Therapies

In Cooperation With:

Society of American Gastrointestinal Endoscopic Surgeons

Society for Minimally Invasive Therapy

Moderator: Col. Richard M. Satava MD

1000 Advanced Telepresence Surgery System Development
Joel F. Jensen MSEE

1020 Interactive Visual Man-Patient Interface for Semi-Immersive Endoscopic Surgery
Christophe R. Laurent MD

1040 Interactive Operation Planning and Control with VIRIM
Christof Reinhart Dipl-Phys

1100 3D Computer Assisted Design of Plastic Reconstructive Surgery Procedures
Edoardo Raposio MD

1120 SAGES and Ethicon Invited Lecturer: Alexander Tsiaras

Sponsored by: Society of American Gastrointestinal Endoscopic Surgeons
and Ethicon Endo-Surgery, Inc.



ETHICON ENDO-SURGERY
a Johnson & Johnson company

Alexander Tsiaras' photojournalism has graced more than 75 magazine covers internationally, including LIFE, Smithsonian, and the New York Times Magazine. He is also the winner of the "World Press Award". Mr. Tsiaras will be presenting his latest works in art, science, and journalism, including computer generated images of a multi-dimensional fly-through of the entire human body.

Anatomical Travelogue

1200 Break

Moderator:	Patrick J. Kelly MD
1300	Computer Aided Surgery Planning and Virtual Reality at the Mayo Clinic <i>Richard A. Robb PhD</i>
1320	Geometric and Physical Representations Used for a Simulator of Hepatic Surgery <i>Herve Delingette PhD</i>
1340	Virtual Endoscopy of the Head and Neck <i>Cdr. Shaun B. Jones MD</i>
1400	Surgical Simulation in Endoscopic Surgery: The Virtual Reality Flexible Ureteroscopy Simulator <i>Glenn M. Preminger MD</i>
1420	Video Game Performance and Laparoscopic Skill Acquisition in First Year Surgery Residents <i>Suzanne J. Weghorst</i>
1440	Simulation and Modeling of Penetrating Wounds from Small Arms <i>Robert Eisler</i>
1500	Break

Education & Training: Tools for Future Health Care Providers

Moderator:	Dr rer nat Hans B Sieburg
1515	A Virtual Simulation Environment for Learning Epidural Anesthesia <i>Don Stredney</i>
1535	Virtual Echography: the Simulation of Ultrasonographic Examination <i>Delphine Henry</i>
1555	IMPACT - A VR-Based System for Diagnosis and Therapy for Neurological Movement Disorders <i>Torsten Kuhlen Dipl-Inform</i>
1615	The Visible Human Image Database - Male and Female <i>Victor M. Spitzer PhD</i>
1635	Incorporating Visible Human Project Data Into the Undergraduate Anatomy & Physiology Curriculum <i>Steven Senger PhD</i>
1655	Developing a Virtual Reality/Multimedia Application for Anatomy Education <i>Helene M. Hoffman PhD</i>
1715	Introduction of New Medical Technology to the Undergraduate Curriculum <i>Scott A. Klein</i>
1735	Assessing a Virtual Reality Surgical Simulator <i>Rob Johnston</i>
1755	Discussion
1815	Adjourn
1830 to 1930	Welcome Reception Sponsored by AT&T Hyatt Regency Regency Ballroom, 4th Floor



FRIDAY January 19, 1996 San Diego Convention Center
Third Floor Rooms 6C - 6F

TELEcommunications + MEDICINE = Expanding Horizons for Healthcare
In Cooperation With:
Advanced Research Projects Agency
Institute for Interventional Informatics
Institute for Telemedicine, Center for the New West
Pacific Bell Health Care Market Group

Moderator: Jack Moncrief MD

0800 The Hyper Hospital: VR-Mediated Networked Medical Care System
Takami Yamaguchi MD, PhD

0820 Recent Advances in Telemedicine: An Asynchronous Network,
Virtual Reality Tools, and the DOCKing Station
David C. Balch MA and Dave Warner MD

0840 Remote Access to Neurosurgical ICU Physiological Data Using the WWW
Valeriy Nenov PhD

0900 Primary Care and Hemodialysis Monitoring Through Telemedicine
Jack W. Moncrief MD

0920 Medical Emergency Aid Through Telematics
George Anogianakis PhD

0940 The Cybermensch Simulation Server for the Planning of Clinical Trials 2.0
Dr rer nat Hans B. Sieburg

1000 Break

Moderator: Jay Sanders MD

1030 Enhanced Surgical Conference System with VR
Hiroshi Oyama MD

1050 Remote Guided Surgical Navigation in ENT Surgery
Michael Truppe MD

1110 Health Care in Correctional Institutions: A Telemedicine Case Study
Robert M. Brecht PhD

1130 Keynote Address: Col. Fred Goeringer MS, MBA
U.S. Army Medical Research & Materiel Command
Targeting the Mission: Saving Lives Through Telemedicine

1200 Break

1215 West Managed Health Care Congress Plenary Address - SDCC 6B
Nicholas Negroponte, founder of MIT Media Lab, senior columnist Wired Magazine, author, Being Digital
MMVR:4 delegates are invited to attend this one hour session during the lunch break

Moderator:	Betsy S. Blakeslee PhD, Telemedicine Liaison, Department of Defense Telemedicine Testbed
1330	<p>Panel: Hightech Healthcare: the Emerging Market for Telemedicine <i>As the telecommunications and entertainment industries are restructured in the wake of telecom reform, they are positioning themselves to play a central role in the transformation of health care delivery systems through information and communications technologies.</i></p> <p><i>These expert panelists will explore how technology will affect systems and applications, and create emerging markets for telemedicine.</i></p> <p>Discussants: Leslie A. Sandberg PhD, Vice President Health Care Market Group, Pacific Bell Daniel R. Sudnick PhD, Director Health Informatics & Telemedicine Systems, AT&T Stuart Wolf PhD, Vice President Health Services, AND/TCI Interactive</p>
1430	<p>1996 Satava Award Presented by: Walter J. Greenleaf PhD and Samuel G. Varnado PhD <i>Instituted in 1995 and named for Col. Richard M. Satava MD, this award will be given each year to an individual demonstrating unique vision and commitment to the transformation of medicine through communication. Nominees will be selected from among those presenting at the 1996 conference.</i></p>
Moderator:	Cdr. Shaun B. Jones MD
1440	<p>Toward Virtual Teleconferencing for Telemedical Applications Henry Fuchs PhD</p>
1500	<p>Telemedicine and Security: Confidentiality, Integrity, and Availability Penny Jennett PhD</p>
1520	<p>The Risk Factors Determining the Survivability of Telemedicine Jay H. Sanders MD</p>
1540	<p>The Vestibular System and VR: User Effects, Dizzy Patient Rehabilitation and Telemedicine Consultations Erik Viirre MD PhD</p>
1600	<p>Telemedicine and the Electronic Medical Record: The Perfect Couple Howard Belzberg MD</p>
1620	<p>Transcontinental Teleradiology System: Superspecialists Serving the Community Zoran L. Barbaric MD</p>
1640	<p>Remote Obstetric Care by Telepresence John P. Brennan MD</p>
1700	<p>Teleproctaring Laparoscopic Operations with Off-the-Shelf Technology Donna R. Luttmann RN, BSN</p>
1720	<p>Complex Task Performance in Cyberspace: Surgical Procedures in a Telepresence Environment Jan C. Bowersox MD, PhD</p>
1740	Discussion
1800	Adjourn

SATURDAY January 20, 1996 Hyatt Regency San Diego

SESSION A Healthcare: The Market for Emerging Technologies

Moderator: Ben Delaney

0800 A Glimpse at the Surgery of the Next Century
S. Morry Blumenfeld PhD

0820 Next Generation Computer Architectures for Medical Visualization/Simulation
John Flynn PhD

0840 Rehabilitation and Disability Solutions
Walter J. Greenleaf PhD

0900 Initial Validation on Ixion Interactive Virtual Reality Medical Simulators
David Hon

0920 The Role of Computer Based Simulation for Training Surgeons
Kevin McGovern

0940 Discussion

1000 Break

Moderator: Glenn M. Preminger MD

1020 Teleos Virtual Environment Toolkit for Simulation-Based Surgical Education
Dwight Meglan PhD

1040 Volume Rendering of Visible Human Data for an Anatomical Virtual Environment
John Kerr PhD

1100 Virtual Reality Hysteroscopy: New Horizons in Training for Gynecologic Surgeons
Jeffrey S. Levy MD

1120 Integrated Medical Environments and the Virtual Reality Patient
Bettina A. Babbitt PhD

1140 Discussion

1200 Break

Moderator: Helene M. Hoffman PhD

1300 Virtual Reality Simulation of Endoscopic Surgery
Louis Rosenberg

1320 Virtual Design Prototyping Applied to Medical Facilities
Paul G. Breen

1340 A Virtual Reality Interface to an Intelligent Dental Care System
Jens Herder Dipl-Inform

1400 Digital Dentistry: Virtual Reality in Orthodontics
Michael D. Snow BSc

1420 Virtual Planning of Oral Implant Surgery
Kris Verstreken MD MSEE

1440 Discussion

1450 Adjourn

SESSION B Technology: The Tools to Make it Work

Moderator: Erik Viirre MD PhD

0800 Simultaneous Planning and Execution in Cranio-Maxillofacial Surgery
Petra Bohner Dipl-Inform

0820 Patient Specific Anatomic Models - Geometric Surface Generation
From 3D Medical Images Using a Specified Polygonal Budget
Bruce M. Cameron MS

0840	Ultra Wide Band Holographic 3D Ultrasonic Imaging of Breast and Liver Phantoms <i>David M. Sheen PhD</i>
0900	Robotic Arm Enhancement to Accommodate Improved Efficiency and Decreased Resource Utilization in Complex Minimally Invasive Surgical Procedures <i>W. Peter Geis MD</i>
0920	Surface EMG for the Control of Anthropomorphic Teleoperator Fingers <i>Narender P. Reddy PhD</i>
0940	Discussion
1000	Break
Moderator: Walter J. Greenleaf PhD	
1020	Surgical Simulation of Facial Paralysis <i>Tatsuya Konno</i>
1040	Virtual Reality Volumetric Display Techniques for 3D Medical Ultrasound <i>Rik Littlefield MS</i>
1100	ARTEMIS - An Advanced Robotic Telemanipulator for Minimally Invasive Surgery <i>Bernhard Neisius Dipl-Ing</i>
1120	The Influence of LCD Shutter Glasses on Spatial Perception in Stereoscopic Visualization <i>Cletus vonPichler Dipl-Ing</i>
1140	Discussion
1200	Break
Moderator: Don Stredney	
1300	Using Human Factor Analysis and VR Simulation Techniques for the Optimization of the Surgical Worksystem <i>Cletus vonPichler Dipl-Ing</i>
1320	Real Time Visually and Haptically Accurate Surgical Simulation <i>Karl D. Reinig PhD</i>
1340	Light Directed Laparoscopy: A New Approach to Intelligent Control <i>Guenter Schaller MD</i>
1400	Progress in the Development of a Telerobotic Capability for Dexterity-Enhanced Microsurgeries <i>Hari Das PhD</i>
1420	An Intelligent System with EMG Based Joint Angle Estimation for Telemanipulation <i>Srikanth Suryanarayanan MS</i>
1440	Discussion
1450	Break
Moderator: Col. Richard M. Satava MD	
1510	A Ray-Traced Texture Mapping for Enhanced Virtuality in Image-Guided Surgery <i>Pierre Jannin</i>
1530	High Resolution Ultrasound Imaging for Battlefield Applications <i>Alan K. Morimoto PhD</i>
1550	Force Feedback for a Virtual Reality Based Minimally Invasive Surgery Simulator <i>Roger Baumann Dipl-Ing</i>
1610	Respiratory Mechanics: Integrating Anatomy and Physiology in 3D <i>Dimitri Metaxas PhD</i>
1630	Expert Surgical Assistant: An Intelligent Virtual Environment with Multimodal Input <i>Mark Billingham MPhil</i>
1650	Discussion
1700	Adjourn

MMVR:5

PLAN NOW TO ATTEND

Medicine Meets Virtual Reality:V
January 22-25, 1997
San Diego Marriott Hotel & Marina

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ACCREDITATION:

The University of California, San Diego School of Medicine, is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to sponsor continuing medical education for physicians.

The University of California, San Diego School of Medicine designates this continuing medical activity for 33 hours in Category 1 of the Physician's Recognition Award of the American Medical Association and for the Certification Program of the California Medical Association.

Physicians must sign in once daily.
Attendance certificates will be mailed.

PRESENTERS

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Ian Alger MD

American Psychiatric Assoc.

George Anogianakis PhD

Aristotle Univ. Thessaloniki

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