MMVR 200

The 9th Annual
Medicine Meets Virtual Reality Conference

Outer Space,
Inner Space,
Virtual Space

Jointly sponsored by
University of California, Irvine, College of Medicine
& Aligned Management Associates, Inc.

With special participation of: Telemedicine and Advanced Technology Research Center / US Army Medical Research & Materiel Command • BARCO Projection Systems, Inc. • Stanford University Medical Media & Information Technologies • Silicon Graphics / SGI Medical • Ciprico • EDN Reality, Inc. • UsabilityMDx, Inc. & Southern California Biomedical Council • Jet Propulsion Laboratory, California Institute of Technology

JANUARY 24 – 27, 2001
NEWPORT BEACH MARRIOTT HOTEL & TENNIS CLUB
NEWPORT BEACH, CALIFORNIA
Program Committee

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Stanford University

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Medical Simulation Center

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Technical University Berlin

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Childrens Hospital Los Angeles
University of Southern California

Kevin Montgomery PhD
National Biocomputation Center, Stanford University

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University of Bern

Makoto Nonaka MD PhD
Foundation for International Scientific Advancement

Roger Phillips PhD MBCS
Dept of Computer Science, University of Hull

Richard A. Robb PhD
Biomedical Imaging Resource, Mayo Clinic & Foundation

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University of Central Florida

Gerald M. Roth MD
University of California, Irvine, College of Medicine

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Stanford University Medical Center

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AdMeTech & Beth Israel Deaconess Medical Center

Don Stredney
Ohio Supercomputer Center

Kirby G. Vosburgh PhD
CIMIT / Massachusetts General Hospital

Dave Warner MD PhD
MindTel LLC & Institute for Interventional Informatics

Suzanne J. Weghorst
Human Interface Technology Lab,
University of Washington

Brenda Wiederhold PhD MBA BCIA-C
Center for Advanced Multimedia Psychotherapy

For the past nine years, Medicine Meets Virtual Reality has promoted VR as a tool for better health. This international, multidisciplinary forum is where computer scientists and medical professionals integrate their accomplishments and vision.

The exchange of novel ideas and experience is what makes this conference vibrant. We want your participation to be educational, thought-provoking, and challenging. And please be sure to complete the evaluation form so we can make MMVR even better in the future.

Karen S. Morgan & James D. Westwood
Aligned Management Associates, Inc.

Course Description

MMVR2001 provides a forum for exchanging, developing, and disseminating innovative ideas for interactive computer-based tools in healthcare. These ideas are considered in a context supporting minimally invasive clinical care that is both medically and economically advantageous. For firms that create and market these tools, this conference provides the opportunity to demonstrate their products to an informed audience.

The program consists of three half-day general sessions, six half-day parallel sessions, three workshops, two evening educational events, two adjunct symposia, exhibits, and an exhibitor reception. All are designed to encourage open dialogue between participants, speakers, and moderators.

The conference organizers are solely responsible for the design and production of this conference, including final selection of topics and speakers. Because the conference’s goal is to promote education, all speakers are asked to present information, answer questions, and interact with participants in a manner that is both educational and free of commercial bias.

The conference sponsors and organizers encourage feedback from medical professionals, educators, industry, and conference participants. The course evaluations, including suggestions and criticism, will be welcomed and carefully analyzed to determine content and organization of future meetings.

Course Objectives

MMVR2001 has three primary goals:

- To share clinical research and experience with interactive computer-based tools for medical diagnosis, therapy, education, and rehabilitation, for the purpose of creating informed clinical use of interactive computer-based tools by physicians and other healthcare providers
- To educate healthcare providers on the goals, methods, successes, and limitations of products commercially available and refine the evaluation of products’ relevance to day-to-day clinical care and training; and also to nurture a partnership with industry to promote continually improved and economically viable products for care and education
- To define vision goals that will guide medicine into a future of (a) improved minimally invasive diagnosis and treatment, (b) significantly enhanced educational methods, (c) expanded communication and research networks for providers and patients, and (d) greater efficiency in delivering optimal patient care

After attending MMVR2001, participants will be able to:

- Discuss innovative computer-based applications in medical education, such as surgical simulators, interactive educational programs and evaluation tools, and Internet-based instructional materials
- Review the progress made in the area of telemedicine and comment upon how advances in robotics, sensors and data networks can facilitate the growth of medicine at a distance
- Describe some of the surgical tools, such as image-guided surgery and robotics, that enable minimally invasive surgery to become even more precise
- Review key issues involved in the development of a truly electronic medical record, such as data management, network architecture and reliability, and security and confidentiality
- Comment upon the use of immersive virtual environments in psychology to assist diagnosis and therapy, including the control of phobias and other disorders

Accreditation

This activity has been planned and implemented in accordance with the Essentials Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint sponsorship of the University of California, Irvine, College of Medicine and Aligned Management Associates, Inc. The University of California, Irvine, College of Medicine is accredited by the ACCME to provide continuing medical education for physicians and takes responsibility for the content, quality, and scientific integrity of this CME activity.

Presenters at this conference are expected to disclose any potential conflict of interest with any commercial entity that may have an interest in the subject matter presented here and to disclose any off-label use, if applicable, of a medical product or device at the beginning of their presentation in accordance with ACCME Essential Areas and Policies.

The University of California, Irvine, College of Medicine designates this continuing medical education activity for a maximum of 23.5 hours Category 1 credit toward the Physicians'
Recognition Award of the American Medical Association. Each Physician should claim only those hours of credit he/she actually spent in the educational activity.

**AMA, Inc. Mission Statement**

Aligned Management Associates, Inc., a biomedical communications company, aims to transform medicine through communication. Its mission is to create exceptional opportunities for healthcare providers and supporting biomedical firms to share medical and scientific experience, technology, ideas, and vision. AMA, Inc. has offices in San Luis Obispo, California and New London, Connecticut.

**Commercial Relationship Disclosures**

Thiru Annaswamy MD
Phantom (Using their device in this project).

Bettina A. Babbitt PhD
Usability MDx, Inc. (President of corporation / Said corporation maintains membership in SCBC)

Cagatay Basdogan PhD
Jet Propulsion Laboratory (Senior member of technical staff)

William C. Beavin
The Boeing Co. (Employee)

Alexander Berestov PhD
Canon (Employee)

Marly Bergerud
Eon Reality, Inc. (Is partner with South Orange County Community College District's VR center)

Thomas Buerger
Virtual Presence (Utilizes Virtual Presence's MIST VR system, is one of its biggest customers, and participates in development of this system.)

Fred Dech
Silicon Graphics / SGI Medical (Uses SGI hardware and software in research)

Andy Dobrzeniecki PhD
Insight A/S (Majority shareholder)
SAI Denmark A/S (Consultant, partnership)
BARCO (Partnership)

Shelly Farnham PhD
Microsoft (Employee)

Thomas A. Furness III PhD
Microvision (Utilizes Virtual Retinal Display and is consultant and shareholder)
Ocumed (Utilizes Scanning Fiber Endoscope and is consultant)

Anthony G. Gallagher PhD
Virtual Presence (Utilizes Virtual Presence's MIST VR system in both studies presented)

Thomas J. Goulder PhD
Harris Communications (Referral fee paid if I-Communicator is purchased)

Sanae Hariri
SUMMIT (Collaborator on simulator research study, without financial compensation)

Wm. LeRoy Heinrichs MD PhD
Immersion Corp. (Shareholder)
SUMMIT (Employee, in conjunction with Stanford University)
BARCO (Unpaid consultant)

Larry F. Hodges PhD
Virtually Better (Co-founder and shareholder)

Maureen K. Holden PhD PT
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David Kahler MD
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Smith & Nephew (Equipment loan and research support)

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SGI (Support for rendering animations)
BARCO (Some funding support)

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Stanford/SUMMIT (Non-commercial collaborator)

Gerald R. Moses PhD
USA/MRMC/TATRC (Research projects supervisor)

Nobuhiko Mukai
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Lutz-P. Nolte PhD
Medivation (Supports research with R & D grant)

Steinar Onnmedal
GE-Vingmed Ultrasound (Relationship without direct financial support)
Mison A/S (Relationship without direct financial support)

Peter Oppenheimer
SGI (Is member of Virtual Worlds Consortium and donates and leases computers to lab)
Conference Information

Carla M. Pugh MD
SUMMIT (Significant, non-commercial relationship)

Jan Sigurd Rotnes MD Phd MSc
SimSurgey AS (Managing director and minor shareholder)

Richard M. Satava MD FACS
USA/ MRMC (Part-time employee)

Ashley Seehusen
Karl Storz GmbH (Partners on MISSIMU Project)
Thomson Training & Simulation (Partners on MISSIMU Project)

Clarence A. Semple
Usability Mdx, Inc. (Vice-president / Said corporation maintains membership in SCBC)

Steven Senger PhD
SUMMIT (Associated under NGI grant)

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Dynamic Health Care (COO)
Allied Professional Health Care (COO)

Ronald J. Sparks PhD
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Victor M. Spitzer PhD
USA/MRMC (Some funding support)
SGI (Support for rendering animations)
BARCO (Some funding support)

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Clinical Tools, Inc. (President)

Lennart Thurfjell PhD
ReachIn Technologies (R & D manager)

Kirby G. Vosburgh PhD
Medical Media Systems (Consultant)
GE (Retiree)

Commercial relationship disclosures were not received from:

Ludwig M. Auer MD
ISM-Austria

Lada Gonchar
University of Karlsruhe

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Washington DC Computer Assisted Surgery Society (WashCAS)

Hunter Hoffman PhD
HIT Lab, Univ of Washington & Univ Washington Dept of Rehab Medicine/Burn Center

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EON Reality, Inc.

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Presentation Schedule

WEDNESDAY 1/24/01

Precision Healthcare: The TATRC Annual Principal Investigators Review

The Telemedicine and Advanced Technology Research Center (TATRC) of the US Army Medical Research and Material Command of the Department of Defense (DoD) will conduct their Annual Principal Investigators Review and showcase new medical technologies that are funded through Congressionally Directed Programs.

The Review is open to all MAVR2001 registrants.

Please see the separate program for the TATRC PI Review's schedule and presenter materials.

THURSDAY MORNING 1/25/01

General Session - Simulation
Moderator: Richard M. Satava MD FACS

8:00 Karen S. Morgan & James D. Westwood
     Allegiance Management Associates, Inc.
     Welcome/Continuing Medical Education, FDA, and Disclosure Issues

8:10 Richard M. Satava MD FACS
     Dept of Surgery, Yale Univ School of Medicine
     The BioIntelligence Age: An Update

8:40 Karl Reining PhD
     Center for Human Simulation, Univ of Colorado School of Medicine
     An Authoring Tool for Interactive Anatomic Animations

8:55 Sabine Girod MD DDS PhD
     National Biocomputation Center, Stanford Univ
     3-D Simulation of Craniofacial Surgical Procedures

9:10 Gerald R. Moses PhD
     TATRC, US Army Med Research & Materiel Command
     Medical Modeling and Simulation for Military Trauma Care Training

9:25 Joseph M. Rosen MD
     Dartmouth-Hitchcock Medical Center
     Future Applications of Virtual Reality to Strategically Manage Disaster Responses

9:50 Keynote: Thomas A. Furness III PhD
     Director, Human Interface Technology Lab, Univ of Washington
     True Confessions of a Photon

10:15 Break

Simulation (cont.)
Moderator: Heinz U. Lamke PhD

10:30 Thomas Buerger
     European Surgical Institute
     Inevitable Developments for VR Training Systems: The ESI Perspective

10:45 Tianyu Lu PhD
     Lab of Intelligent and Parallel Systems (LIPS), College of Engineering,
     Univ of Hawaii at Manoa
     Endoscopic Exploration and Measurement from 3D Angiography
     and Intravascular Ultrasound Images

11:00 Cagatay Bezdogan PhD
     Jet Propulsion Lab, California Inst of Technology

11:15 Richard A. Robb PhD
     Biomedical Imaging Resource, Mayo Clinic & Foundation
     From Visible to Virtual to Functional Human: Multidimensional Visualization Beyond Anatomy

11:35 Keynote: Kevin S. Mack
     Visual Effects Supervisor, Digital Domain
     Visualization of the Future

12:00 Break

THURSDAY AFTERNOON 1/25/01

Session A - Computer-Assisted Surgery
Moderator: Roger Phillips PhD MBBS

1:20 Welcome

1:30 Lutz-P. Nolte PhD
     M. E. Muller Inst. for Biomechanics, Univ of Bern
     Joint Replacement - A Challenge for Image Guided Surgery in the New Millennium

1:45 Roger Phillips PhD MBBS
     Dept of Computer Science, Univ of Hull
     A Robotic Approach to Proximal Tibia and Distal Femur Osteotomies

2:00 Oleg Krivonos, Dipl.-Inform.
     Lehrestitul fuer Informatik V, Univ of Mannheim
     Computer-Assisted Treatment of Pelvis Fractures

2:15 David M. Kahler MD
     Dept of Orthopaedic Surgery, Division of Trauma, Univ of Virginia Health System
     Virtual Fluoroscopy: A Tool for Decreasing Radiation Exposure During Femoral Intramedullary Nailing

2:30 Sorin O. Blundea MD
     Orthopedic Traumatology, Hospital Michallon
     Clinical Validation of Percutaneous Computer Assisted Pelvic Surgery Using Ultrasound: A Safe Technique with Low Radioscopic Radiation
THURSDAY AFTERNOON 1/25/01

Session B - Surgical Simulation
Moderator: Wm. LeRoy Heinrichs MD PhD

1:20   Welcome

1:30   Wm. LeRoy Heinrichs MD PhD
Medical Media & Information Technologies / Dept of Gyn. & Ob., Stanford Univ
On Implementing Fundamental Manipulations in Surgical Simulators

1:45   Randy S. Haluck MD
The College of Medicine, The Pennsylvania State Univ
A Virtual Reality Surgical Training Module for Instruction in Angled Laparoscopic Lens Navigation

2:00   Anders Larsson
Gothenburg Univ Surgical Science AB
Intracorporeal Suturing and Knot Tying in Surgical Simulation

2:15   James D. Hoskins
Center for Minimally Invasive Surgery, Univ of Kentucky College of Medicine
Immersive Virtual Reality Used as a Platform for Perioperative Training for Surgical Residents

2:30   Liliane dos Santos Machado
Lab de Sistemas Integrares, Univ de Sao Paulo
A Virtual Reality Simulator for Bone Marrow Harvest for Pediatric Transplant

2:45   Cynthia Bruyns MS
NASA Ames Research Center
Advanced Astronaut Training / Simulation System for Rat Dissection

3:00   Reider Källström MD
Dept of Biomedicine and Surgery, Linköping Univ
Application of a Novel Real-Time Simulation Model with Haptic Feedback in Training Transurethral Prostatic Surgery

3:15   Break

Session B - Surgical Simulation (cont.)
Moderator: Anthony G. Gallagher PhD

5:00   Gary Onik MD
Director of Surgical Imaging, Celebration Health
Computer-Assisted Cryosurgery

5:15   George V. Kondraske, PhD
Human Performance Institute, University of Texas at Arlington
Performance Model of Robotic-Assisted Laparoscopy

5:30   Hamid Reza Abbasi MD PhD
Image Guidance Laboratories, Dept of Neurosurgery, Stanford Univ
Sch of Medicine
Development of Fluoroscopic Registration in Spinal Neuronavigation

5:45   Break

Wolfgang K. Mülner, Dipl.-Inform.
Forschungs-Institut für Graphische Datenverarbeitung Abteilung, Visualisierung & Virtuelle Realität
LAHISTOTRAIN - Development and Evaluation of a Complex Training System for Hysteroscopy

3:45   Anthony G. Gallagher PhD
No. Ireland Center for Endoscopic Training & Research & Sch of Psychology, Queen’s Univ of Belfast
Objective Psychomotor Skills Assessment of Experienced, Junior and Novice Laparoscopists with Virtual Reality
4:00 Warren D. Smith PhD
Biomedical Engineering, California State Univ, Sacramento
Virtual Instrument Measurement of the Effect of Table Height on
Laparoscopic Surgeons' Physical and Mental Workload

4:15 Warren Viant
Dept of Computer Science, Univ of Hull
The Development of an Evaluation Framework for the
Quantitative Assessment of Computer-Assisted Surgery and
Augmented Reality Accuracy Performance

4:30 Kevin P. Sherman MA FRCS
Orthopaedic Department, Hull and East Yorkshire Hospitals NHS Trust
Surgical Trainee Assessment Using a VE Knee Arthroscopy Training System (VE-KATS): Experimental Results

4:45 Jan Sigurd Rotnes MD PhD MSc
Interventional Centre, Rikshospitalet & SimSurgery AS
Digital Trainer Developed for Robotic Assisted Cardiac Surgery

5:00 Daniel Berg MD FRCP
tUniv of Washington Medical Center
Issues in Validation of a Dermatologic Surgery Simulator

5:15 Gerald A. Higgins PhD
Washington B.C. Computer Assisted Surgery Society (WashCAS)
Modeling & Simulation in Medicine: Towards an Integrated Framework

5:30 Break

THURSDAY AFTERNOON 1/25/01

Session C - Workshops

1:20 - 3:15 Workshop: Medical Device Usability Engineering
Organizer: Bettina A. Bobbitt PhD, President, UsabilityMDx, Inc.
Sponsored by the Southern California Biomedical Council and UsabilityMDx, Inc.

Faculty:
Bettina A. Bobbitt PhD
Clarence A. Semple MA
Ronald J. Sparks PhD
UsabilityMDx Inc.

David G. Geffen
Attorney at Law

In late 1999, the National Institute of Medicine (NIM) reported that
human errors in medicine may be causing more fatalities than auto-
mobile accidents, breast cancer, or AIDS. NIM urged the healthcare
industry to reduce errors by 50% within the next 5 years. Many
errors can be eliminated through usability engineering of medical
devices. This technology can also reduce device recalls and liability
exposure, as well as expand market share.

The "Medical Device Usability Engineering" workshop provides partici-
pants with a working understanding of:

- Usability engineering objectives and methods as they apply to
  medical device Quality System Regulation (QSR)
- Associated medical device design issues, labeling, device user train-
  ing
- Legal implications such as OEM liability exposure.

Information is presented in the context of the Food and Drug
Administration's (FDA) usability engineering thrust and guidelines.

3:30 - 5:00 Workshop: Interactive Visual Simulation, VR: Changing The Way
People Learn
Sponsored by EON Reality, Inc.

Faculty:
Marly Berenger
Dean, Business and Vocational Education
Advanced Technology and Education Park, Tustin, California
South Orange County Community College District

Mats W. Johansson
President/CEO
EON Reality, Inc.
Irvine, California

As the computer changes business, educational presentation, interaction
and self-paced delivery, so will interactive, 3D realistic visual simulation
drastically alter how we train and educate the learner in the 21st century.
Preview this advanced technology of a Critical Care Nurses pilot project
where the learner enters and experiences the new learning environment on
the web and discover its impact and educational benefits of moving beyond
"Computer Based Training to Virtual Reality.

THURSDAY EVENING 1/25/01

The Poster Reception
6:00 - 7:30

A popular MMVR event, the Poster Reception offers novel one-on-one
opportunities for education. Participants discuss a broad spectrum of
topics directly with presenters while enjoying a casual social atmos-
phere. Expect engaging computer-based demonstrations as well as tra-
ditional displays of research.

POSTER PRESENTATIONS:

Hamid Reza Abbasi MD PhD
Image Guidance Laboratories, Dept of Neurosurgery, Stanford Univ
Sch of Medicine
Neuroradiological Epilepsy Focus Mapping
Hae-Bum Ahn  
Dept. of Biomedical Engineering Graduate School, College of Medicine, Hanyang Univ  
Development of Virtual Reality Driving Simulator for Rehabilitation

Rodolfo D. Altrudi MD  
Dept of Informatics and Records, The National Inst of Social Services for Retired and Pensioned  
Internet as an "Honest" Management Tool: First Experience in a National Institute of Health and Social Services in Argentina

William C. Beavin  
The Boeing Company  
The Role of an Aerospace Giant in a Deployable Healthcare System-of-Systems

Catherine Burghart PhD  
Inst of Process Control and Robotics, Univ of Karlsruhe  
Safety in Computer Assisted Surgery

Bruce D. Campbell MS  
HIT Lab, Univ of Washington  
The Virtual Anatomy Lab: A Hands-On Anatomy Learning Environment

Sascha Däuber, Dipl.-Phys.  
Institute for Process Control and Robotics, Dept of Computer Science, Univ of Karlsruhe  
Statistical Analysis of the Morphology of Three-Dimensional Objects and Pathologic Structures Using Spherical Harmonics

Venkat Devarajan PhD  
Southwestern Center for Minimally Invasive Surgery / Electrical Engineering & Biomedical Engineering Depts, Univ of Texas at Arlington  
Bimanual Haptic Workstation for Laparoscopic Surgery Simulation

Andy B. Dobrzeniecki PhD  
3D Lab, Panum Inst, Univ of Copenhagen & Medical Insight A/S  
The Visualarium: Enterprise-Wide Distribution of Visualization and Computer-Aided Diagnostics

Emmanuel Dubois  
TIMC, Faculté de Médecine (IAB), Domaine de la Marci  

Keyvan Faruhani PhD  
Dept Radiological Sciences, UCLA Sch of Medicine  
Radiologist Tele-Presence in MR-Guided Neurosurgery

Lauren W. Gevshon MA  
Center for Advanced Multimedia Psychotherapy  
Exploring Fear of Flying from a Psychodynamic Perspective

Andrea Giachetti  
Visualization and Virtual Reality Group, CRIS 4  
Measurable Models of Abdominal Aortic Aneurysm on the Web

Orlando Goletti MD  
Dept of Surgery, Pisa Univ, Santa Chiara Hospital  
Telesonography: Technical Problems, Solutions and Results in the Routine Utilization from Remote Areas

Lada Gonchar  
Inst for Process Control and Robotics, Univ Karlsruhe  
Virtual Simulation System for Collision Avoidance for Medical Robot

Darcy Drew Greene  
Michigan State Univ  
Completing A Life

Randy S. Haluck MD  
College of Medicine, The Pennsylvania State Univ  
A Prototype Haptic Suturing Simulator

Ragnhild Halvorsrud PhD  
Telenor Research & Development, Applied Media Technology  
The MATADOR Project - A Novel Simulator in Emergency Medicine

Sanaz Hariri  
Stanford Univ Medical Center, Dept of Neurosurgery  
Quantification of the Gravity-Dependent Change in the C-arm Image Center for Image Compensation in Fluoroscopic Spinal Neuravigation

Harold Hoppe, Dipl.-Phys.  
Univ of Karlsruhe (TH), Dept of Computer Science, Inst for Process Control and Robotics  
Intraoperative Visualization of Surgical Planning Data Using Video Projectors

C. Sean Hundtofte  
Dept of Computer Science, Johns Hopkins Univ  
Software Framework for a Surgical Guidance System Using Magnetic Markers

Jeffrey Jacobson  
Dept of Information Science, Univ of Pittsburgh  
The Balance NAVE: A Virtual Reality Facility for Research and Rehabilitation of Balance Disorders

Anne-Claire Jambon MD  
Hôpital Jeanne de Flandre, Centre hospitalier et universitaire de Lille  
Achievement of a Tool for Measuring the Forces Exercised During Laparoscopic Gestures

Raleigh F. Johnson, Jr. PhD  
The University of Texas Medical Branch  
An Inexpensive 3D MR and CT Imaging Phantom for Evaluation and Calibration of 3D Image Processing Algorithms

Alexander Koprelyants MD PhD  
Inst for Problems of Cryobiology & Cryomedicine, Natl Academy of Sciences of the Ukraine  
Computing of Electron-Microscopic Images of Cellular Structures

Ioannis A. Kakadiaris PhD  
Dept of Computer Science, Univ of Houston  
Computer-Aided Breast Reconstructive Surgery
Erwin Keeve PhD
Surgical Simulation and Navigation Group, CAESAR - Center of Advanced European Studies and Research
A General Software System for Surgical Planning and Intra-Operative Guidance

Sun I. Kim PhD
Dept. of Biomedical Engineering, College of Medicine, Hanyang Univ
The Development of the Virtual Reality System for the Treatment of Fears of Public Speaking

Riitta-Liisa Kortesluoma LicMSc
Learning and Research Services, Univ of Oulu
University-Level Telemedicine Education in Finland

Oleg Krivonos, Dipl.-Inform.
Lehrstuhl fuer Informatik V, Univ of Mannheim
Computer Simulation of Ostentomey Correction

Jeonghun Ku
Dept. of Biomedical Engineering, College of Medicine, Hanyang Univ
Development of Virtual Reality Therapy System for the Treatment of Acrophobia

Anders Larsson
Gothenburg Univ Surgical Science AB
An Open and Flexible Framework for Computer Aided Surgical Training

Shannon B. McGehee MA
Center for Advanced Multimedia Psychotherapy
Determinants of Levels of Presence and Immersion in a Virtual Heights Environment

Sushil Kumar Meher
All India Inst of Medical Sciences
Internet and AIDS in India

Arianeb Mehrabi MD
CBF-Labor, Chirurgische Universitatsklinik Heidelberg
Development of an International Net-Based Information System for Advanced Surgical Education

Megumi Nakao
Graduate Sch of Informatics, Kyoto Univ
4D Visible and Palpable Simulation Using Dynamic Pressure Model Based on Cardiac Morphology

Max M. North PhD
Virtual Reality Technology Lab, Computer Science and Information Systems, Kansas State Univ
Sense of Presence Factors Affecting Virtual Reality Therapy

Gabriele Optale MD
Association of Medical Psychotherapists, Venice
Rites of Passage and Virtual Reality

Daniela Pless, Dipl.-Ing. (FH)
Dept of Diagnostic Imaging, Univ of Ulm
Multislice CT and Computational Fluid Dynamics: A New Technique to Visualize, Analyze and Simulate Hemodynamics in Aortic Aneurysms and Stentgrafts

Alexandra Rodu
Romanian Radio Broadcasting
CompAc - Integrated Informatic System for Diagnosis and Treatment Assistance in Traditional Chinese Medicine

Mark Riding
Manchester Visualization Centre, Univ of Manchester
Cost Effective Haptic Feedback for Low Fidelity Surgical Trainers

Dr.-Ing. Robert Rinner
Inst of Automatic Control Engineering, Technical Univ of Munich
A Survey Study for the Development of Virtual Reality Technologies in Orthopedics

Giuseppe Riva PhD
Applied Technology for Neuro-Psychology Lab, Istituto Auxologico Italiano
Interfacing Health Care: The Reality of VR-Based Telemedicine

Louis Rosenberg PhD
Immersion Corporation
Strides in Medical Technology: Teaching with Touch and Advancing to Virtual Surgery

Prof. Ing. Alberto Rovetta
Dipartimento di Meccanica, Politecnico di Milano
A New Portable Equipment for Detection of Psychophysical Conditions in Normal and Exceptional Environments with Virtual Reality Measurements

Sarmad Sadeghi MD
Intelligent Diagnostics, Inc.
Decision Support System for Medical Triage

Arif Budi Satria
Schr. of Medicine, Padjadjaran Univ
Using E-Mail and Instant Messenger (Chatting) in the School of Medicine, Padjadjaran University: An Effort to Increase Quality of Teaching to Face Globalisation

Oliver Schorr, Dipl.-Inform.
Inst for Process Control and Robotics, Univ of Karlsruhe
Comparison of Tracking Techniques for Intraoperative Presentation of Medical Data Using a See-Through Head-Mounted Display

Oliver Schorr, Dipl.-Inform.
Inst for Process Control and Robotics, Univ Karlsruhe
An Endoscopic Navigation System

Anatoliy Shevelev PhD
Telemedicine Lab
Telemedicine of Ukraine

Noaki Suzuki PhD
Inst for High Dimensional Medical Imaging, Jikei Univ Sch of Medicine
Collaborated Surgical Works (Surgical Planning) in Virtual Space with Tactile Sensation Between Japan and Germany

T. Bradley Tanner MD
Univ of North Carolina, Chapel Hill & Clinical Tools, Inc.
Keeping Sharp: Internet CE Update and Experience
FRI DAY MORNING 1/26/01

General Session - Surgical Simulation & Some New Directions
Moderator: Richard A. Robb PhD

8:00 Welcome

8:05 Frank Tendick PhD
Dept of Surgery, Univ of California San Francisco
Measuring In Vivo Animal Soft Tissue Properties for Haptic Modelling in Surgical Simulation

8:20 Leslie L. Hiemenz Holton PhD
Center for Human Simulation, Univ of Colorado
Force Models for Needle Insertion Created from Measured Needle Puncture Data

8:35 Jacob Rosen PhD
Dept of Electrical Engineering, Univ of Washington
Objective Laparoscopic Skills Assessments of Surgical Residents Using Hidden Markov Models Based on Haptic Information and Tool / Tissue Interactions

8:50 Anthony G. Gallagher PhD
No. Ireland Center for Endoscopic Training & Research & Sch of Psychology, Queen’s Univ of Belfast
Objective Computer-Based Assessment of Perceptual Skill that Predicts Laparoscopic Performance in Three Separate Studies

9:05 John D. McBryar PhD
SAMPLES Program Manager, Sandia National Laboratories
MEMS for the Biomedical World

9:20 Alan Liu PhD
National Capital Area Medical Simulation Center, Uniformed Services Univ
A Computer-Based Simulator for Diagnostic Peritoneal Lavage

9:35 Keynote: Paul Bridger PhD
California Institute of Technology
Scanning Probe Microscopes as Biosensors

10:00 Break

Surgical Simulation & Some New Directions (cont.)
Moderator: Greg T. Mogel MD

10:15 Mitsubishi Hayashibe
Department of Mechano-Informatics, University of Tokyo
Laser-Pointing Endoscope System for Natural 3D Interface between Robotic Equipments and Surgeons

10:30 David L. Dawson MD
Medical Sciences Division, National Aeronautics and Space Administration
Modeling and Simulation for Space Medicine Operations: Preliminary Requirements Considered

10:45 Kevin Montgomery PhD
National Biocomputation Center, Stanford Univ
Virtual Reality-Based Surgical Training for Long Duration Space Missions

11:00 Alexander Twombly PhD
USRA / RMCS
NASA Virtual Glovebox (VGB): Advanced Astronaut Training and Simulation System for the International Space Station

11:15 Keynote: Julie A. Swain MD
Acting Deputy Associate Administrator, National Aeronautics and Space Administration
Astronauts and Surgeons: Challenges from Extreme Environments

11:40 Presentation of the Seventh Annual Satava Award

12:00 Break

FRI DAY AFTERNOON 1/26/01

Session A - Visualization & Modeling
Moderator: Don Strodel

1:20 Welcome

1:30 Nobushiko Mukai
Mitsubishi Electric Corporation
New Graphics Models for PC Based Ocular Surgery Simulator

1:45 Martin Rydmark MD PhD
Medvet, Gotteborg Univ
3D Visualization and Stereographic Techniques for Biomedical Research and Education
2:00  Marcelo Knorrich Zuffo PhD  
Lab do Sistemas Integrados, Univ do Sao Paulo  
Interactive Stereoscopic Full-Color Direct Volume Visualization for Virtual Reality Applications in Medicine

2:15  Ludwig M. Auwer MD  
ISM-Austria  
Validation of Virtual Endoscopy for Application in Clinical Neurosciences

2:30  Daigo Tanaka MA  
Dept of Plastic and Reconstructive Surgery, Keio Univ Sch of Medicine  
Web-Based Educational Tool for Cleft Lip Repair Using XVL

2:45  Suvarna De  
Lab for Human and Machine Haptics, MIT  
A Meshless Numerical Technique for Physically Based Real Time Medical Simulations

3:00  Andreas Paterakis  
Inst of Mathematics and Computer Science in Medicine, Univ Hospital Eppendorf  
Exploring the Visible Human's Inner Organs with the VOXEL-MAN  
3D Navigator

3:15  Break

Session A - Visualization & Modeling (cont.)
Moderator: Michael J. Ackerman PhD

3:30  Alfredo Tirado-Ramos  
Philips Research Laboratories  
Object-Oriented Representation of System Support for Biotechnologies and Biological Pathways Under Different Environments

3:45  Marco Agus  
Visualization and Virtual Reality Group, CRS4  
An Integrated Environment for Stereoscopic Acquisition, Off-Line 3D Elaboration, and Visual Presentation of Biological Actions

4:00  Christian Dieter Essemann, Dipl.-Ing. (FH)  
Mayo Clinic & Foundation  
Measurement and Display of Myocardial Motion During Post Infarct Treatment

4:15  Terry S. Yoo PhD  
Office of High Performance Computing and Communications, National Library of Medicine  
Anatomic Modeling from Unstructured Samples Using Variational Implicit Surfaces

4:30  Jeremy D. Ackerman  
Univ of North Carolina, Dept of Computer Science and Dept of Biomedical Engineering  
Real-Time Anatomical 3D Image Extraction

4:45  Jianhua Yao  
Computer Science Department, Johns Hopkins Univ  
Reconstructing a Hierarchical Tetrahedral Mesh for a Density Model of Bony Anatomy

5:00  Oliver Schorr, Dipl.-Inform.  
Inst of Process Control and Robotics, Univ of Karlsruhe  
A New Concept for Intravascular Ultrasound and CT

5:15  Clay E. Nordquist MSE  
Univ of Texas Medical Branch  
A Correction Algorithm for Image Motion Artifacts

5:30  Jonathan C. Silverstein MD MS FACS  
Virtual Reality in Medicine Lab, Univ of Illinois at Chicago  
Automatization of Three-Dimensional Radiological Data

5:45  Break

FRIDAY AFTERNOON 1/26/01

Session B - Simulation
Moderator: Rainer M.M. Seibel MD

1:20  Welcome

1:30  Daren Lee MS  
Dept of Computer Sciences, Univ of California, Los Angeles  
Automated Skeleton Generation for Visualization of 3D, Time-Dependent Fluid Flows: Application to the Virtual Aneurysm

1:45  Peter Oppenheimer  
HIT Lab, Univ of Washington  
The Representation of Blood Flow in Endoscopic Surgical Simulations

2:00  Thorsten R. Fleiter MD  
Univ of Ulm  
Individual Design of Bifurcated Aortic Stents Using Bloodflow Simulation and Interactive Virtual Environment

2:15  Björn Sander, Dipl.-Ing.  
High Performance Computing Center Stuttgart (HLRS)  
Computational Fluid Dynamics (CFD): Coupled Solving of CFD and Structure Mechanics in Aneurysms and Stentgrafts Having Regard to the Elastic Behaviour of the Aortic Wall and Varying Positions of the Stentgraft

2:30  Daniel T. Boll MD  
Dept of Diagnostic Imaging, Univ of Ulm  
Simulation and Analysis of Air Flow in Physiological and Stenotic Tracheas Utilizing Computational Fluid Dynamics Based on Multislice CT Datasets

2:45  Herwig Mayr, Dipl.-Ing.  
Dept of Software Engineering for Medicine, Upper Austrian Polytechnic Univ  
Virtual Eye Muscle Surgery Based Upon Biomechanical Models

3:00  Lennart Thurfell PhD  
ReachIn Technologies AB & Centre for Image Analysis, Uppsala Univ  
A Medical Platform for Simulation of Surgical Procedures

3:15  Break
**Session B - Simulation (cont.)**
Moderator: Kirby G. Vesburgh PhD

3:30  Dog KJE von Lubitz PhD MD(sc)
Dept of Emergency Medicine, Univ of Michigan
The Vibe of the Burning Agents: Simulation and Modeling of Burns and their Treatment Using Agent-Based Programming, Virtual Reality and Human Simulation

3:45  Derek P.M. Wills
Dept of Computer Science, Univ of Hull
An Efficient Method for Realistically Modelling Soft Tissue in Virtual Environment Training Systems

4:00  Ashley Seehusen
Univ of Bristol
Human Perception of Haptic Information in Minimal Access Surgery Tools for Use in Simulation

4:15  Nigel W. John PhD
Manchester Visualization Centre, Univ of Manchester
An Integrated Simulator for Surgery of the Petrous Bone

4:30  Thiru M. Ananiaswamy MD
University of Texas Southwestern Medical Center
Development and Evaluation of a Epidural Injection Simulator with Force Feedback for Medical Training

4:45  Ole Vilhelm Larsen
Dept of Medical Informatics and Image Analysis, Aalborg Univ
The Virtual Brain Project: Development of a Neurosurgical Simulator

5:00  Break

**FRIDAY MORNING 1/26/01**

**SYMPOSIUM: VR & Mental Health**
Brenda K. Wiederhold PhD MBA BCIA-C and Ian Alger MD, Co-Chairs
Moderators: Larry Hodges PhD and Giuseppe Riva PhD

8:30  Brenda K. Wiederhold PhD MBA BCIA-C
Center for Advanced Multimedia Psychotherapy
Introduction

8:40  Milton Huang MD
Psychiatric Informatics Program, Univ of Michigan Health System
Immersive Tendencies and Self Awareness

8:55  Azurena Garcia-Palacios PhD
Universidad Jaume I
Why Virtual Reality Exposure Therapy?

9:10  David-Paul Partenb
Dept of Computer Science, University College London
An Experiment on Fear of Public Speaking in Virtual Reality

9:25  Marel Krijn
Dept of Psychology, Univ of Amsterdam
Review of Three Dutch Studies on Virtual Reality Treatment of Acrophobia

9:40  Young Hee Choi MD
Inje Univ, Seoul Paik Hospital
The Short-Term Treatment of Acrophobia with Virtual Reality Therapy (VRT): A Casa Report

9:55  Break

**VR & Mental Health (cont.)**
Moderators: Sun I. Kim PhD and Brenda Wiederhold PhD MBA BCIA-C

10:15  Brenda K. Wiederhold PhD MBA BCIA-C
Center for Advanced Multimedia Psychotherapy
Using Advanced Technologies to Treat Fear of Driving

10:30  Azurena Garcia-Palacios PhD
Dept Psicologica Basica, Clinica y Psicobiologia, Universitat Jaume I
Telepsychology: Public Speaking Fear Treatment in Internet

10:45  Stéphane Bouchard PhD
Univ of Quebec at Hull
Psychotherapy in Videoconference: A Control Outcome Study of Behavioral Telehealth

11:00  Francesco Vincelli MS
Laboratorio Sperimentale di Psicologia, Istituto Auxologico Italiano
A Multicomponent Treatment for Panic Disorders with Agoraphobia

11:15  Ralph Mager MD
Center of Applied Technologies in Mental Health, Univ of Basel
Real Time Monitoring of Brain Activity in Patients with Specific Phobia During Exposure Therapy Employing a Stereoscopic Virtual Environment

11:30  Patrice Renaud PhD
Univ of Quebec at Hull
Visual Tracking of Virtual Objects as a Dynamic Measurement of Behavioral Avoidance in Arachnophobia

11:45  Kimberly Swinth
Dept of Psychology, Univ of California, Santa Barbara
A Threshold Model of Social Influence within Immersive Virtual Environments

12:00  Break

**FRIDAY AFTERNOON 1/26/01**

**SYMPOSIUM: VR & Mental Health (cont.)**
Moderators: Ian Alger MD and Hunter Hoffman PhD

1:30  Ian Alger MD
New York Presbyterian Hospital/Weill Medical College of Cornell Univ
Introduction

1:40  Hunter Hoffman PhD
Univ of Washington HIT Lab & U.W. Dept of Rehab Medicine/Burn Center
The Effectiveness of Virtual Reality Pain Control with Multiple Treatments
1:55 Mioko Ohsuga (Dr. Eng.)
Advanced Technology R&D Center, Mitsubishi Electric Corp.
VR System for Mental and Physical Activation

2:10 Susan M. Schneider PhD RN AOCN
Duke University
Effect of Virtual Reality on Symptom Distress in Breast Cancer Patients

2:25 Larry F. Hodges PhD
GVU Center, College of Computing, Georgia Inst of Technology
Use Virtual Reality as a Distractor for Painful Procedures in Pediatric Cancer Patients

2:40 Shelly Farnham PhD
Virtual Worlds Group, Microsoft Research
HutchWorld: Computer-Mediated Social Support for Hematopoietic Stem Cell Transplant (HCT) Recipients and Their Caregivers

2:55 Break

VR & Mental Health (cont.)
Moderators: Azucena Garcia-Palacios PhD and Alex Bullinger MD

3:15 Patrice Renaud PhD
Univ of Quebec at Hull
Measuring Sexual Preferences in Virtual Reality: A Pilot Study

3:30 Alex H. Bullinger MD
Visualization and Networking, COAT-Basel (Center of Applied Technologies in Mental Health)
Trajectories Towards Anthropocentric Stereoscopic Virtual Environments

3:45 Norman E. Alessi MD
Univ of Michigan Dept of Psychiatry, Psychiatric Informatics Program, PsychMeSiLab
Motion Analysis in Depression

4:00 Ioannis Tarnanas MSc
Aristotle Univ of Thessaloniki
Using Virtual Reality to Teach Special Populations How to Cope in Crisis: The Case of a Virtual Earthquake

4:15 Todd Bowery
Fuller Graduate School of Psychology
The Virtual Classroom: A Virtual Reality Environment for ADHD Assessment

4:30 Discussion

5:00 Break

SATURDAY MORNING 1/27/01

General Session - The Second Annual BARCO Stereoscopy Demonstration

Session Chair: Wm. LeRoy Heinrichs MD PhD
Moderators: Nigel John PhD and Kevin Montgomery PhD

8:00 Wm. LeRoy Heinrichs MD PhD
Medical Media & Information Technologies / Dept of Gyn. & Ob., Stanford Univ
Introduction to Stereoscopic Projection Technology

Andrew Joel
Market Development Manager, Virtual and Augmented Reality, BARCO Projection Systems Inc.
Introduction to BARCO Technology

Almos Elkes PhD
Medical Director, SGI
Introduction to SGI Technology

John Eric Tanner
Business Manager, Southwest, Ciprico
Introduction to Ciprico Technology

8:10 Martin Rydmark MD PhD
Mednet, Goeteborg Univ
Fifteen Years’ Experience of Biomedical 3D Reconstruction and Visualization

8:23 Victor M. Spitzer PhD
Center for Human Simulation, Univ of Colorado Sch of Medicine
The Visible Human Project ATLAS of Functional Human Anatomy
Version 1.0 The Head and Neck

8:36 Chris Lee
Univ of Colorado Health Sciences Center
Interactive Stereo Atlas of the Visible Human Male

8:49 Saki Srivastava MD MS
SUMMIT, Stanford Univ
On Teaching Hand Anatomy Dynamically

9:02 Steven Senger PhD
Dept of Computer Science, Univ of Wisconsin - La Crosse
Stereoscopic Visualization and Immersive Segmentation of Volumetric Data Sets

9:15 Alexander Berestov PhD
Canon R&D Center Americas, Inc.
Stereoscopic X-Ray Image Processing

9:28 Nigel W. John PhD
Manchester Visualization Centre, Univ of Manchester
The Radford Pelvis Collection

9:41 Megumi Nakao
Graduate Sch of Informatics, Kyoto Univ
Active Heart
9:54  Simon Wildermuth MD  
National Biocomputation Center, Stanford Univ  
Advanced Astronaut Training/Simulation System for Rat Dissection

10:07  Break

Stereoscopy Demonstration (cont.)  
Moderators: Martin Rydmark MD PhD and Victor M. Spitzer PhD

10:25  Michael J. Mastrangelo, Jr. MD  
Center for Minimally Invasive Surgery, Univ of Kentucky College of Medicine  
Using Immersive VR as a Tool for Preoperative Planning for Minimally Invasive Donor Nephrectomy

10:38  Lennox Hoyte MD  
(Wm. LeRoy Heinrichs MD PhD, presenter)  
Depts Ob/Gyn & Radiology, Brigham & Women’s Hospital  
A Virtual Pregnant Human Surrogate for Crash Testing

10:51  Steiner Ommedal BSc  
Sintef Unimed  
Stereoscopic Visualization in Neurosurgery

11:04  Kevin Montgomery PhD  
National Biocomputation Center, Stanford Univ  
Craniofacial Stereoscopic 3D Reconstruction Images

11:17  Michael Rosenthal  
Dept of Computer Science, UNC-Chapel Hill  
Three-Dimensional Intraoperative Visualization for the TIPS Intervention

11:30  Andreas Petersik  
Inst of Mathematics and Computer Science in Medicine, Univ Hospital Eppendorf  
Exploring the Visible Human’s Inner Organs with the VOXEL-MAN 3D Navigator

11:43  Parvati Dev PhD  
SUMMIT, Stanford Univ  
Stereoscopy Overview

12:00  Break

**SUNDAY AFTERNOON 1/27/01**

**Session A - Medical Education**  
Moderator: Helene M. Hoffman PhD

1:20  Welcome

1:30  Michael R. Tracey MS  
The Catholic Univ of America & AnthroTronic, Inc.  
The Interaction of Spatial Ability and Motor Learning in the Transfer of Training from a Virtual to a Real Task

1:45  Helen St. Aubin PhD  
Central Arizona College  
Implementing a Virtual Reality Paradigm In Human Anatomy / Physiology College Curricula

2:00  Christoph Kaufmann MD MPH FACS  
Uniformed Services Univ / Medical Simulation Center  
Trauma Training: Virtual Reality Applications

2:15  Helene M. Hoffman PhD  
Learning Resources Center, UCSD Sch of Medicine  
Anatomic Visualizer vs. PowerPoint: A Comparative Study Among Students Learning Lung Anatomy

2:30  Carla M. Pugh MD  
Stanford Univ  
The Effect of Simulators on Learning and Self-Assessment: Stanford University’s E-Pelvis Simulator

2:45  Gunnar Ahlberg MD  
Dept of Surgery, St. Goran’s Hospital  
Does Training in VR Simulator Improve Surgical Performance?

3:00  Sabine Trochim, Dipl-Inform.  
GMD - German National Research Center for Information Technology  
An Enabling System for Echocardiography Providing Adaptive Support through Behavioral Analysis

3:15  Break

**Session A - Medical Education (cont.)**  
Moderator: Christoph Kaufmann MD MPH FACS

3:30  Nigel W. John PhD  
Manchester Visualization Centre, Univ of Manchester  
Web-Based Surgical Educational Tools

3:45  Dr.-Ing. Robert Kienzer  
Inst of Automatic Control Engineering,Technical Univ of Munich  
Development of a Multi-Modal Virtual Human Knee Joint for Education and Training and Orthopedics

4:00  Frank Tendick PhD  
Dept of Surgery, Univ of California San Francisco  
Spatial Ability and Learning the Use of an Angled Laparoscope in a Virtual Environment

4:15  Break

**SATURDAY AFTERNOON 1/27/01**

**Session B - Telemedicine & Related Technologies**  
Moderator: David C. Balch MA

1:20  Welcome

1:30  William J. Chmielak PhD  
East Carolina Univ Sch of Medicine  
Rapid Deployment of Healthcare to Remote Disaster Areas

1:45  Alex Gandos MD  
Duke Univ Medical Center, Dept of Surgery  
Wireless Vital Signs Telemetry to Hand Held Computers
2:00  Amela Sadoglu PhD  
Advanced Networks and Services  
National Tele-Immersion Initiative: Towards Compelling Tele-Immersive Collaborative Environments

2:15  David C. Balch MA  
The Telemedicine Center, East Carolina Univ  
Telemedicine Used in a Simulated Disaster Response

2:30  Hisham M. Sherif MD  
Dr. Red Duke, Inc.  
Design and Construction of a Computer-Based Logical System for Medical Diagnosis

2:45  Jennick Rolland PhD  
O.D.A. Lab, Univ of Central Florida  
Innovative Displays for Augmented Reality Applications and Remote Collaborations

3:00  Michael D. Snow BDS(Hons) MDSc  
Dental & Cliffs Unit, Monash Medical Ctr, Southern Health Care Group  
Interactive, Virtual Teledentistry Permits Specialist Dental Consultations and Best, Direct Local Care

3:15  Break

Session B: Telemedicine & Related Technologies (cont.)  
Moderator: Suzanne J. Weghorst

3:30  Suzanne J. Weghorst  
MIT Lab, Univ of Washington  
Collaboration Tools for the Distributed Tumor Board

3:45  Michael L. Gimbel MD  
Univ of California, San Francisco & Univ of Pittsburgh Medical Center  
The Use of Web-Based Technologies to Improve Diabetic Foot Wound Management: The Pacific Rim Telehealth Project (PRTP)

4:00  Jocim Stollfors MD  
Dept. of Otolaryngology, Head and Neck Surgery, Sahlgren University Hospital  
Haptic Palpation of Head and Neck Cancer Patients: Implications for Education and Telemedicine

4:15  Fred Dohr  
Virtual Reality in Medicine Lab, Univ of Illinois at Chicago  
Manipulation of Volumetric Patient Data in a Distributed Virtual Reality Environment

4:30  Lyn Yaffe MD  
Illinois Institute of Technology Research Institute (IITRI)  
Robotics Model for an Intelligent Robotic Medic

4:45  Johannes Müller MD  
Deutsches Herzzentrum Berlin  
Transtelephonic Monitoring: Reliable Non-Invasive Rejection Monitoring after Heart Transplantation by an Implantable Multisensor Device

5:00  Break

SATURDAY AFTERNOON 1/27/01

Workshop: Simulating Minimally Invasive Surgical Procedures in Virtual Environments: MODELING

Organizer: Cagatay Basdogan PhD

This tutorial will focus on modeling aspects of medical simulation. The topics covered in this tutorial will include modeling for 3D visualization, physics-based models for graphical and haptic display of soft tissue behavior, models for simulating instrument-tissue interactions, and models for measuring tissue properties and evaluating surgical skills of the user. Although some overview of the work in the field will be given, our intent is to highlight the major research problems in the area of modeling and provide the audience with technical and practical implementation details.

Presenters:
Kevin Montgomery PhD  
Stanford-NASA Biocomputing Center  
http://biocomp.stanford.edu/kevin/

Cagatay Basdogan PhD  
Jet Propulsion Laboratory, California Institute of Technology  
http://eis.jpl.nasa.gov/~basdogan/

Uwe Kuehnnapfel PhD  
Forschungszentrum Karlsruhe, Institut fuer Angewandte Informatik  
http://www.kisnet.ifi.fz.de/

Jacob Rosen PhD  
Biorobotics Laboratory, University of Washington  
http://rcs.ee.washington.edu/BRL/

1:20  Cagatay Basdogan PhD  
Introduction and Overview

1:35  Kevin Montgomery PhD  
Modeling and segmentation for 3D visualization  
- Edge detection and segmentation  
- 3D reconstruction  
- Scientific visualization of 3D medical data

2:25  Cagatay Basdogan PhD  
Physics-based models for graphical and haptic display of tissue behavior  
- Physically-based modeling for simulating soft tissue behavior in real-time  
- Haptic rendering of deformable objects  
- Software architecture for integrating visual and haptic displays

3:15  Break

3:35  Dr.-Ing. Uwe Kühnnapfel  
Models for simulating instrument-tissue interactions  
- Simulation of grasping, clipping, and cutting  
- Visualization and animation of coagulation  
- Simulation of irrigation and suction, and pulsatile arterial bleeding  
- Morphodynamic simulation: pulse, stomach, and intestine motion  
- Simulation of sling interactions and suturing
4:25 Jacob Rosan PhD
Models for measuring tissue properties and evaluating surgical skills of the user
- Surgical device development and modification
- Force reflective grasper for MIS
- In-vivo measurements of soft tissues
- Models for objective evaluation of surgical skill

5:15 Break

SATURDAY MORNING 1/27/01

SYMPOSIUM: VR & Mental Health
Moderators: Norman E. Alesis MD and Stéphane Bouchard PhD

8:25 Ian Alger MD
New York Presbyterian Hospital/Weill Medical College of Cornell Univ
Introduction

8:30 Giuseppe Riva PhD
Applied Technology for Neuro-Psychology Lab, Istituto Auxologico Italiano
The VEPSY Project: Virtual Reality in Clinical Psychology

8:45 Marja-Leena Mielonen RN MA
Dept of Psychiatry, Oulu Univ Hospital
Telepsychiatry: Experiences of Inpatients' Care Negotiations

9:00 Pamela Whitten PhD
Michigan State Univ, Dept of Telecommunication
Integrating a Care Continuum through Telepsychiatry: Solving the Challenges of Employing Technology within Medicaid Managed Care

9:15 David Gowerhope PhD
Telehealth Unit, The Faculty of Medicine, Univ of Calgary
An Evaluation of a Computer-Based Psychiatric Assessment: Evidence for Expanded Use

9:30 James L. Spira PhD MPH ABPP
Health Psychology Program - Mental Health Services, Navy Medical Center
The Feasibility of Subtle Experiential Therapeutic Methods via Televideo Technology: Using Hypnosis and Biofeedback with ViaTV

9:45 T. Jordon Gould PhD
CSPPP Research and Service Foundation
The Greater Minnesota Capacity Assessment and Training Program (GMCAT) - Achieving Critical Mass in Rural School Districts for Deaf and Hard of Hearing Students Via Personal Intervention and Technology

10:00 Break

VR & Mental Health (cont.)
Moderators: James S. Elkind LICSW BCD and Skip Rizzo PhD

10:30 Brenda Wiedehold PhD MBA BCIA-C
Center for Advanced Multimedia Psychotherapy
Using Advanced Technologies in the Treatment of Social Phobia

10:45 Harry Karlinsky MD
Dept of Psychiatry, Univ of British Columbia
Telemental Health Programs: Underappreciated "Microbarriers" to Implementation

11:00 James S. Elkind LICSW BCD
Programs for People with Disabilities, Jewish Family & Children's Service
A Simulated Reality Scenario That Assesses Specific Executive Functions Compared with the Wisconsin Card Sorting Test: An Analysis of Preliminary Results

11:15 Lamberto Piron MD
Univ of Padova, Dept. Neurology and Psychiatry & San Camillo Hospital, Venezia
Virtual Reality as an Assessment Tool for Arm Motor Deficits after Brain Lesions

11:30 Maria T. Schultheis PhD
Neuropsychology & Neuroscience Lab, Kessler Medical Rehabilitation Research & Education Corp.
Advantages of VR in Driving Assessment of Cognitively Impaired Populations

11:45 Jocelyn McGee
Fuller Graduate School of Psychology
Assessment of Visuospatial Skills in Older Adults Using Virtual Environment Technology

12:00 Break

SATURDAY AFTERNOON 1/27/01

SYMPOSIUM: VR & Mental Health (cont.)
Moderators: Milton Huang MD and Dorothy Strickland PhD

1:30 Brenda K. Wiedehold PhD MBA BCIA-C
Center for Advanced Multimedia Psychotherapy
Introduction

1:35 Maureen K. Holden PhD PT
Dept of Brain and Cognitive Sciences, MIT
Retraining of Movement Control in Patients with Acquired Brain Injury Using a Virtual Environment

1:50 Albert "Skip" Rizzo PhD
Univ of Southern California
Judgement of Emotional Expression in 3D Facial Avatars Created Using Performance Driven Animation: Towards Populating Mental Health VR Applications with Believable Virtual Human Representations

2:05 Ian Alger MD
New York Presbyterian Hospital/Weill Medical College of Cornell Univ
The Social Context in Virtual Reality

2:20 Milton Huang MD
Psychiatric Informatics Program, Univ of Michigan Health System
Phenomenology of Consciousness in Virtual Experience
The Modified Cyberarium
6:30 - 8:30 "Grok-IT Science 2001: First Principles of Applied Mind-Altering Technology"

Sponsored by the Institute for Interventional Informatics, MindTel, Center for Advanced Multimedia Psychotherapy, Ideations, and the VR-Psych special interest group

Organizers: Dave Warner MD PhD and Brenda K. Wiederhold MBA PhD BCIA

Come have a hands-on look at what the mental health community is doing with advanced technologies. The Cyberarium will provide an opportunity for individuals to try many of the currently available tools used by mental health professionals in the diagnosis, assessment, and treatment of many disorders.

The Cyberarium will also provide a series of ten-minute talks by professionals about the research they are currently involved with. The evening will begin with songs written and performed by Galen Brandt, who has been involved with virtual healing for the past decade.

The following groups will be attending and displaying their technologies:

2Moro, Inc.
Sun I. Kim PhD
http://www.namo.hanyang.ac.kr/2m

2Moro, Inc. designs, develops, and sells virtual reality systems for phobic disorders and neurorehabilitation.

Center for Advanced Multimedia Psychotherapy
Brenda K. Wiederhold PhD MBA BCIA
http://www.wphobia.com

The Center utilizes advanced technologies in its treatment of phobic and panic disorders and eating disorders. CAMP, a non-profit organization, is involved in research, clinical services, and serves as a beta test site for virtual reality and internet-based systems.

Young Hee Choi MD
Inje University, Seoul Paik Hospital
ltohicho@ssinet.net

Dr. Choi provides treatment of phobic disorders and panic disorder using a combination of cognitive-behavioral therapy and virtual reality systems.

Michigan State University
Darcy Drew Greene
greenea@msu.edu

Interactive patient software on end-of-life issues and breast cancer issues will be displayed.

Previ, Inc.
Cristina Botella PhD
http://www.previal.com

Previ, Inc. designs, develops, and sells virtual reality systems for phobic disorders and eating disorders.

University of Southern California
Integrated Media Systems Center
Skip Rizzo PhD
http://imsc.usc.edu

USC's IMSC will demonstrate technology that allows a 360-degree panoramic view to be captured as video and ported through virtual reality head-mounted display systems. This provides an added degree of realism to the virtual experience.

Virtual Reality Aids, Inc.
Dorothy Stickland PhD
http://www.vraids.com

DozLearn.com develops web information and games for children with autism and related disabilities. Games use web-delivered 2D graphics and virtual reality to teach language, safety, and social skills.

Virtually Better, Inc.
Ken Groap MD
http://www.virtuallybetter.com

Virtually Better designs, develops and researches virtual environments for use in therapeutic settings.

VRHealth.com
Giuseppe Riva PhD
http://www.vrhealth.com

VRHealth.com designs, develops, and performs clinical trials on virtual reality systems and web-based systems for the treatment of phobic and panic disorders and eating disorders. Systems are available for purchase.