THE 12TH ANNUAL
Medicine Meets Virtual Reality
CONFERENCE

Building a Better You:
The Next Tools for Medical Education, Diagnosis, and Care

JOINTLY SPONSORED BY
University of California, Irvine
College of Medicine and
Aligned Management Associates, Inc.

IN COOPERATION WITH:
Telemedicine & Advanced Technology Research Center /
U.S. Army Medical Research &
Material Command
BARCO Simulation Products

JANUARY 14 – 17, 2004
NEWPORT BEACH MARRIOTT HOTEL & TENNIS CLUB
NEWPORT BEACH, CALIFORNIA
Organizing Committee

Michael J. Ackerman PhD *
Office of High Performance Computing & Communications
National Library of Medicine

Ian Alger MD
New York Presbyterian Hospital;
Weill Medical College of Cornell University

David C. Balch MA
DCB Consulting, LLC

Steve Charles MD *
MicroDexterity Systems;
University of Tennessee

Henry Fuchs PhD
Dept of Computer Science
University of North Carolina

Walter J. Greenleaf PhD *
Greenleaf Medical Systems

Randy S. Haluck MD FACS *
Dept of Surgery, Penn State College of Medicine

Wm. LeRoy Heinrichs MD PhD
SUMMIT/Dept of Gynecology & Obstetrics
Stanford University School of Medicine

Helene M. Hoffman PhD *
Educational Computing
School of Medicine, University of California, San Diego

Heinz U. Lemke PhD
Inst for Technical Informatics
Technical University Berlin

Gerald A. Maguire MD
Continuing Medical Education
University of California, Irvine College of Medicine

Greg T. Mogel MD *
Dept of Radiology, University of Southern California;
TATRC/USAMRMC

Kevin N. Montgomery PhD *
National Biocomputation Center
Stanford University

Lutz-P. Nolte PhD
M.E. Müller Institute for Biomechanics
University of Bern

Makoto Nonaka MD PhD
Fdn Ind Sci Advancement

Roger Phillips PhD MBCS *
Dept of Computer Science
University of Hull (UK)

Richard A. Robb PhD *
Biomedical Imaging Resource, Dept Physiology & Biophysics
Mayo Clinic and Foundation

Jannick P. Rolland PhD *
ODA Lab, School of Optics/CREOL
University of Central Florida

Richard M. Satava MD FACS *
Dept of Surgery, University of Washington;
TATRC/USAMRMC; DARPA

Rainer M.M. Seibel MD
Inst of Diagnostic & Interventional Radiology
University of Witten/Herdecke

Steven Senger PhD *
Dept of Computer Science
University of Wisconsin - La Crosse

Ramin Shahidi PhD *
Image Guidance Laboratories
Stanford University School of Medicine

Faina Shtern MD
Radiology Research, Beth Israel Deaconess;
Children's Medical Center/Harvard Medical School

Don Stredney
Interface Laboratory
OSC

Julie A. Swain MD *
Div of Cardiovascular and Respiratory Devices
U.S. Food and Drug Administration

Kirby G. Vosburgh PhD *
CIMIT/Massachusetts General Hospital/Harvard Medical School

Dave Warner MD PhD
MindTel; Syracuse University;
Inst for Interventional Informatics

Suzanne J. Weghorst MA MS *
Human Interface Technology Lab
University of Washington

Mark D. Wiederhold MD PhD
The Virtual Reality Medical Center

* Abstract Review Committee Member
Conference Information

Welcome
Welcome to the 12th annual Medicine Meets Virtual Reality conference.

This year’s theme, “Building a Better You: The Next Tools for Medical Education, Diagnosis, and Care,” focuses on the end use of MMVR research: physicians training and patient care. The research presented during these four days, whether directly or in a supporting role, makes possible better-educated physicians and more effective patient care.

We are pleased to offer you an expanded program on surgical simulation and its supporting technologies, modeling and haptics. The state-of-the-art will be discussed as well as obstacles to overcome before acceptance of simulators is complete.

We also offer you diverse presentations on imaging, robotics, and medical data networking. These technologies are revolutionizing the ability to meet the health needs of an expanding and aging global population.

We give thanks to all the researchers who present their work here at MMVR12. They are responsible for transforming “Building a Better You” from vision into reality.

Evaluation
Please complete and give us your conference evaluation before you leave the conference. The evaluation, as well as the attendance verification form, is mandatory from all persons who want CME credit for attendance.

Input from ALL conference participants, regardless of their need for CME, is welcomed. We will take note of your criticism and suggestions when we create next year’s program. Before you leave the conference, please take a few minutes to share your thoughts, negative and positive, about MMVR.

Target Audience
MMVR12 is for:
- Physicians, surgeons, and other healthcare professionals
- Medical educators and students
- Medical informatics researchers
- IT and medical device developers
- Biomedical futurists and investors
- Military medicine specialists

Course Description
MMVR12 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 clinical care and medical education that is medically and economically advantageous.

The program consists of three plenary sessions, six parallel sessions, three workshop activities, one poster session, and one adjunct symposium. All activities are designed to encourage open dialogue between participants, speakers, and moderators.

Course Objectives
After completion of this educational activity, participants should be able to:
- Identify the state-of-the-art for surgical simulation and its enabling technologies: haptics and tissue modeling and simulation
- Identify emerging tools for clinical diagnosis and therapy, including imaging devices, robotics, data visualization methods and networks, and simulated environments

Accreditation Statement
This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education 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.

Designation Statement
The University of California, Irvine College of Medicine designates this educational activity for a maximum of 19.25 category 1 credits toward the AMA Physician’s Recognition Award. Each physician should claim only those credits that he/she actually spent in the activity.

Policy Statement
The conference sponsors and organizers are solely responsible for the design and production of this conference, including final selection of topics and speakers. Because the meeting’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.

Disclaimer
The information provided at this conference is intended for general medical education purposes only. All physicians should fully investigate any new product or device before implementing it in their practice. In no event will the University of Cali-
Disclosure Statement

COMMERCIAL PRODUCTS OR SERVICES

The following presenters have disclosed they have no affiliation, financial agreement or arrangement which could be perceived as a potential conflict of interest in their presentation:

- Ian Alger MD
- Dale C. Alverston MD
- Tim Andersen PhD
- Antonia Anogianaki BA
- George Anogianakis MD PhD
- Marc Antonijuan Tresens
- Fernando Bello PhD
- Joao Borelli MSc MEng
- Timothy Broderick MD FACS
- Kate Caldwell
- Bruce M. Cameron MS
- Thomas Preston Caudell PhD
- M. Cenk Cavusoglu PhD
- Amrita Chanda MS
- Duncan Clarke PhD
- Chris E. Constantiniou PhD
- Stéphane Cotin PhD
- Patrick Cregan MB BS FRACS
- Kenneth C. Curley MD
- Robert W. Davis MD FACOG
- Steven L. Dawson MD
- Lucio T. De Paolis
- Nathan J. Delson PhD
- Jaydev Desai PhD
- Venkat Devarajan PhD
- Paola Di Giacomo PhD (Cand)
- Edward Dibble MEng
- Chris F. Dickhaus, Dipl.-Wi.-Ing.
- Warren E. Dixon PhD
- Todd C. Doehring PhD
- Christian Dold, Dipl.-Ing.
- Aristotelis Dosis MSc
- Eileen B. Entin PhD
- Alessandro Faraci MSc
- Li Fellander-Tsai MD PhD
- Sandra Fowler BS
- Reinhard Friedl MD
- Alejandro Gandssas MD
- Paul Gasson
- Walter J. Greenleaf PhD
- Tiffany Grunwald MD
- Chris Gunn BE
- Gregory D. Hager PhD
- Randy S. Haluck MD FACS
- Blake Hannaford PhD
- Albert K. Harris PhD
- Andrew E. Healey MB ChB BSc DMRD FRCR
- Pheng Ann Heng PhD
- Nayyar A. Hussain BMd
- Sung Bae Hwang BS
- Bei Jin MS
- Nigel W. John PhD
- Raleigh F. Johnson PhD

Acknowledgements

The conference organizers wish to thank TATRC/USAMRMC for its educational grant in support of Friday’s surgical simulation plenary session. The conference organizers also wish to thank David Hananel of METI for his invaluable assistance to ensure the educational success of this activity.

The conference organizers also wish to thank BARCO Simulation Products for its educational grant for Saturday’s stereoscopy session.

Additional Thanks

The conference organizers also wish to thank:

- TATRC/USAMRMC for its extensive participation in the conference
- The Abstract Review Committee for its time, energy, and critical judgment
- The Organizing Committee for its ongoing support and shared experience
- The Proceedings editors for their time and expertise
- Andrew Joel and Steven Senger for their help organizing the stereoscopy session

Contact

Medicine Meets Virtual Reality
C/o Aligned Management Associates, Inc.
793-A Foothill Blvd, PMB #119
San Luis Obispo, CA 93405 USA
Phone 805-534-0300
Fax 805-534-9030
mmvr@nextmed.com
http://www.nextmed.com/mmvr_virtual_reality.html
DB Karron PhD
Madeleine Keehner PhD
Thenkurussi Kesavadas PhD
Walaa Khaled, Dipl.-Ing.
Sun I. Kim PhD
Masaya Kitagawa MS
Paul Kizakevich MS PE
Sharon R. Klein
Takamitsu Kondo
S.N. Ragu Kumar MSc MPhil MBA
Yoshihiro Kuroda MS
Hans Lamecker, Dipl. Phys.
Christophe R. Laurent MD
Pascal Le Mer PhD
Doon Yong Lee PhD
Polytirisi Leonardou MD
Harold W. Lewis III PhD
Yi-Je Lim MS
Alex J. Lindblad MS
Kevin Mack
J. Harvey Magee
Ramesh Makam DNB
Maud Marchal MS
Marco Masseroli PhD
David A. McClusky MD
Andrew T. Miller PhD
Greg T. Mogel MD
Louise Moody PhD
Jesper Mosgaard MSc
José Luis Mosso Vázquez MD
Megumi Nakao PhD
Günter Niemeyer PhD
Tore Nilsson DDS
Sarah M. North EdD
Tobias Obst, Dipl.-Ing. Univ.
Allison Okamura PhD
Dmitry Olevnikov MD
Arthur J. Olson PhD
Mark P. Ottensmeyer PhD
Abhilash Pandya PhD (Cand)
Andrew Phelps
Roger Phillips PhD MBCS
Francesco Pinioloni
Mark C. Preul MD
Sonia Pujol PhD (Cand)
Mark E. Rentschler MS
Robert Rienert, Dr.-Ing
Steffen G. J. Rödel MD
Jacob Rosen PhD
James C. Rosser, Jr MD
Ajit K. Sachdeva MD FRCS FACS
Stan Saiki
Armen Sarvazyan PhD DSc
Richard M. Satava MD FACS
Sudhanshu Kumar Senwal PhD
Ramin Shahidi PhD
Jonathan C. Silverstein MD
Alison Simo MSc PhD (Cand)
Jennifer Simpson
Karisa Solt
Syliva Stracke MD
Ségolène Tarre, Dipl.-Math. Eng.
Timo H. Tossavainen MSc
Jakob T. Valvoda, Dipl.-Inform.
Raquel Viciana-Abad MSc
Sebastian Vogt, Dipl.-Inform.
Roger Webster PhD
Suzanne J. Weghorst MA MS
Steve Winner
Yongming Xie
Yasushi Yamauchi PhD
Sun Young Yi MD PhD
Hui Zhang M.A.Sc.
Zhan Zhang PhD
Aleksander Zivanovic PhD

The following presenters have disclosed that their presentation(s) will include discussion of commercial products or services, but they have disclosed that they have no affiliation, financial agreement or arrangement which could be perceived as a potential conflict of interest in their presentation.

Mike Bailey PhD
Mark W. Bowyer MD FACS COL MC USAF
Redmond P. Burke MD
M. Cenk Cuvuoglu PhD
Drew Cheng MD
Kenneth C. Cutley MD
Ann E. Elsner PhD
Anthony G. Gallagher PhD
Karim A. Gawad MD
Brian P. Kritzstein
Alan Liu PhD
Azul K. Madan MD
Michael R. Marohn COL USAF MC FS FACS
Kevin N. Montgomery PhD
Lucian Panait MD
Azhari Rafiq MD
Donald A. Riusucci PhD
E. Matt Ritter MD
Jannick Rolland PhD
Mark W. Scerbo PhD
Neal Seymour MD FACS
Warren D. Smith PhD
Feras M. Toufali MS
Ivan Vesely PhD
Kenneth J. Waldron PhD DS
Bruce Watson
John Winder MSc

SIGNIFICANT COMMERCIAL RELATIONSHIPS

The following presenters have disclosed that their presentation(s) will include discussion of commercial products or services, and the presenters have a significant financial interest or other relationship with the manufacturer of products or provider of services they intend to discuss. Their relationships are also described:

Jeremy Ackerman PhD
InnerOptic stock holder, medical lead
Michelle M. Bagur BS
Touch of Life Technologies
RELATIONSHIP WITH BARCO OR TATRAC/USAMRMC

This activity is supported by grants from BARCO Simulation Products (equipment loan only) and TATRAC/USAMRMC (unrestricted educational grant). The following presenters have disclosed that they have a significant financial interest or other relationship with these commercial supporters. Their relationships are also described:

- Timothy Broderick MD FACS
- TATRAC - IPA for TATRAC
- Duncan Clarke PhD
- Our research is funded by TATRAC
- Stéphane Cotin PhD
- Research partially funded by TATRAC
- Kenneth C. Corley MD
- TATRAC - Program Manager at TATRAC
- Robert W. Davis MD FACOG
- TATRAC is project sponsor for Crowley Davis Research
- Steven L. Dawson MD
- Research support from TATRAC
- Ann E. Elner PhD
- TATRAC manages a line-item grant to my institute on another project: DAMD 17-01-2-0032
- Eileen B. Entin PhD
- Aedima has a project contract with TATRAC
- Anthony G. Gallagher PhD
- TATRAC - I hold a research grant for a multi-center, international VR to OR study
- Randy S. Haluck MD FACS
- Research projects at Penn State funded by TATRAC
- Blake Hannaford PhD
- Our laboratory has a research grant from USAMRMC
- Carol Heiser RN ND
- We are recipients of SBIR-STTR grants from TATRAC in the research and development of medical simulators and haptic technology. It should be noted that no grant from TATRAC directly funded this specific project.
- Brian P. Kritzstein
- Batelle has a relationship with BARCO where we have installed Starlight on their VCAD system to showcase the power of visualization on their hardware.
- William E. Lewandowski MS
- We have several ongoing SBIRs that have been awarded by TATRAC
- Alan Liu PhD
- TATRAC funded contract to perform R & D on medical simulation
- Michael J. Mastroangelo MD
- BARCO - equipment provider
- Kevin N. Montgomery PhD
- TATRAC-funded principal investigator
- Mark P. Ottensmeyer PhD
- The work is supposed by a grant from the US Army, grant # DAMD 17-01-1-0677. The opinions expressed do not necessarily represent those of the Department of Defense.
- Carla M. Pugh MD PhD
- TATRAC - Interpersonnel Agreement (IPA)
- Mark W. Scebo PhD
- TATRAC provided partial funding for the research

Chris Briscoe MA
Primal Pictures Ltd - Creative Director
Neil D. Glossop PhD
Neil Glossop is president of Traxal Technologies (the manufacturer). Product is still a prototype.
Carol Heiser RN ND
Immersion Medical is a for-profit organization which specializes in the commercialization of medical simulators
Eric Herbranson DDS
Brown & Herbranson’s Tooth Atlas (owner)
Jürgen Hesser PhD
Cathi GmbH, spinoff company of the underlying research project
Vassilios Hurnostadis PhD
employee of Primal Pictures Ltd
William E. Lewandowski MS
I will use a simulation developed for Medtronic, Inc. as a case history
Bin Li
We (Ontar Corporation) are developing commercial products as part of the DOD SBIR program. Commercialization is a goal of the SBIR program.
Dag J.E. von Lubitz PhD MD(Sc)
Laerdal, Inc. - equipment grant
Reinhard Masseger PhD
VRmagic GmbH - shareholder
John S. Maier MD PhD
ChemImage Corp - employee
Michael J. Mastroangelo MD
BARCO, Polhemus - equipment provider
Carla M. Pugh MD PhD
METI - license agreement, consultant
Karl D. Reineg PhD
Founding member of Touch of Life Technologies
Daniel J. Scott MD
Grant support - Karl Storz Endoscopy, U.S. Surgical Corporation
Victor M. Spitzer PhD
I am president of Touch of Life Technologies which manufactures the VH Dissector program I will demonstrate
Morris Steffin MD
VR Neurotech is a private start-up owned and funded by Morris Steffin MD
Ivan Veverina MD
xtact SA - employee
Malte Westerhoff
Indeed Visual Concepts GmbH - co-founder
Mark D. Wiederhold MD PhD FACP
President, the Virtual Reality Medical Center
Brenda K. Wiederhold PhD MBA
Principal, Virtual Reality Medical Center
David H. Wilks MD
Medical Education Technology, Inc. (METI) - member of consulting committee
Jurjen Zoetbro PhD
xtact SA - employee and founder
UNLABELED OR INVESTIGATIONAL USE

The following presenters have disclosed that their presentation(s) will include an unlabeled use of a commercial product, or an investigational use not yet approved for any purpose:

Ann E. Elsner PhD
The GDx is made by LDT in San Diego, CA but they do no intend to license or produce this.

Li Fellander-Tsai MD PhD
Procedius Simulator and visual spatial ability

Carol Heiser RN ND
We will be introducing the AccuTouch Hysteroscopy simulation trainer into academic institutions which we believe alter the training of residents, fellows, and practicing physicians from their current way of training.

John S. Maier MD PhD
Falcon Microscopy is unlabeled by FDA for any use.

Michael J. Mastrangelo MD
Amira, “Smart Scene” use with medical dissection

Jannick Rolland PhD
Human Patient Simulator from METI Corporation

James C. Rosser, Jr MD
Grip Lap training

Morris Steffin MD
Method of drowsiness monitoring of drivers in development phase.

Ivan Vecerina MD
Technologies for haptic simulation

Jurjen Zoethout PhD
New tracking and haptic device

NO DISCLOSURE PROVIDED

At the time of this printing, the following presenters did not provide information regarding discussion of commercial products or services, or a significant financial interest or other relationship with a manufacturer of products or provider of services that may be discussed. Additionally, they have not disclosed their intention to discuss the use of any unlabeled/unapproved drugs or devices. However, they have been instructed to provide any such information prior to their presentation:

Vincenzo Costigliola MD
Venkat Devarajan PhD
Yael Friedman PhD
Amin Hadadzadeh MS
Kishalay Kundu MSc
Ariane Mehrabi MD PhD
Naoki Suzuki PhD MD
Mike J.F. Van der Geer MSc
Presentation Schedule

**WEDNESDAY 1/14/04**

8:00 – 5:30  TATRC’s Annual Principal Investigators’ Review * Program

5:30 – 7:30  Networking Reception

See “Special Activities” for additional information.

* Not a CME activity

**THURSDAY MORNING 1/15/04**

**GENERAL SESSION**

8:00  Karen S. Morgan & James D. Westwood
     Aligned Management Associates, Inc.
     Welcome; CME Issues

8:10  Panel Discussion: “Adoption of Advanced Technologies in Medical Education, Diagnosis & Care: Economic and Human Realities”

* Moderator
  Greg T. Mogel MD, Panel Moderator
  Radiology, Univ of Southern California;
  TATRC/USAMRMRC

* Panelists
  Ian Alger MD
  New York Presbyterian Hosp/ Weill Medical College of Cornell Univ
  Psychiatrist-as-Patient: Personal Experience of Full-Body Imaging

  Brenda Wiederhold PhD
  The Virtual Reality Medical Ctr
  A Decade of Virtual Reality in Mental Health: A Road Well-Traveled

  Walter Greenleaf PhD
  Greenleaf Medical Systems
  Rehabilitation Devices and Marketplace Issues for Emerging Technology

  Ramin Shahidi PhD
  Image Guidance Lab, Stanford Univ Sch of Medicine
  Strengths and Limitations of Information-Guided Surgery

  Steve Winner MS
  Silverado Senior Living
  A First-Hand Experience of “Dr. Robot” as Surrogate Healthcare Worker

  Carla M. Pugh MD PhD
  Ctr for Advanced Surgical Education, Northwestern Univ
  Using Simulation Tools to Improve the Established Medical Curriculum

  David M. Hananel
  Surgical Programs, Medical Education Technologies, Inc.
  A Developer’s Perspective on the Implementation of Surgical Simulation Tools

  Sharon R. Klein
  Stradling Yocca Carlson & Rauth
  Legal Barriers to the Adoption of Disruptive Technology

  Panel Discussion - Audience Q/A

10:20  Break – Exhibit Hall Opens

**11:00  GENERAL SESSION (CONT.)**

* Moderator
  Kirby G. Vosburgh PhD

* Panelists
  11:00  Suzanne J. Weghorst MA MS
         HIT Lab, Univ of Washington
         Arthur J. Olson PhD
         Molecular Graphics Lab, Scripps Research Institute
         Augmented Tangible Models for Molecular Biology

  11:15  Anthony G. Gallagher PhD
         Emory Endosurgery Unit, Emory Univ
         VR Applied

  11:35  Presentation of the 10th Annual Satava Award *

12:00  Break

* Not a CME activity
THURSDAY AFTERNOON SESSION A

SESSION A - EDUCATION

Moderator
Helene M. Hoffman PhD

1:10 Moderator's Welcome

1:15 Robert Rieker, Dr.-Ing.
Automatic Control Laboratory, ETH Zurich
A Sensorized Human Torso Phantom

1:30 Alison Simo MSc PhD
Sch of Computing and Mathematics, Univ of Teesside
Virtual Patients in Clinical Medicine

1:45 Robert Rieker, Dr.-Ing
Automatic Control Laboratory, ETH Zurich
Phantom-Based Interactive Simulation System for Dental Treatment Training

2:00 Dale C. Alverson MD
Ctr for Telehealth, Univ of New Mexico Sch of Medicine
Distributed Interactive Virtual Environments for Collaborative Experiential Learning and Training Independent of Distance over Internet2

2:15 Paul Kizakevich MS PE
Technology Assisted Learning, RTI International
Chemical Casualty Simulation for Emergency Preparedness Training

2:30 Dag K.J.E. von Lubitz PhD MD(Sc)
MedSMART, Inc.
Multipoint First Responder Training in Acute Medical Response to Bioterrorism

THURSDAY AFTERNOON SESSION B

SESSION B - HAPTICS

Moderator
Roger Phillips PhD MBCS

3:30 Carla M. Pugh MD PhD
Ctr for Advanced Surgical Education, Northwestern Univ
The Surgical Illustrator: A Web Enabled Computer Program for Documenting Procedural Details

3:45 Alejandro Gandras MD
Surgery, Univ of Kentucky
The Role of Handheld Computers in Telementoring Endoscopic Procedures

4:00 Kevin Montgomery PhD
National Bio-computation Ctr, Stanford Univ
LifeGuard - A Personal Physiological Monitor for Extreme Environments

4:15 Mark D. Wiederhold MD PhD FACP
The Virtual Reality Medical Ctr
Next Generation Biometrics: Non-Imaging Physiometrics

4:30 Morris Steffin MD
VRNEUROTECH
Occam's Approach to Video Critical Behavior Detection: A Practical Real Time Video In-Vehicle Alertness Monitor

4:45 Break

SESSION A - NETWORKING

2:45 Redmond P. Burke MD
Cardiovascular Surgery, Miami Children's Hosp
Virtual Patient Rounds: Creation of a Web-Based Information Management System for a Congenital Heart Team

3:00 Pascal Le Mer PhD
France Telecom R&D
Argonauta 3D: A Real Time Cooperative Medical Planning Software on DSL Network

3:15 Break
### THURSDAY AFTERNOON SESSION B (CONT.)

#### SESSION B – MODELING

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker Name</th>
<th>Presentation Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:45</td>
<td>Blake Hannaford PhD</td>
<td>Characterization of In-Vivo and Postmortem Compressive Biomechanical Properties of Porcine Abdominal Organs</td>
</tr>
<tr>
<td>2:00</td>
<td>Mark P. Ottensmeyer PhD</td>
<td>Comparison of In Vivo, In Vitro Perfused and Unperfused Liver Mechanical Properties</td>
</tr>
<tr>
<td>2:15</td>
<td>Vassilios Hurmusiadis PhD</td>
<td>Visualization of Muscle Function for Medical Education</td>
</tr>
<tr>
<td>2:30</td>
<td>Yoshihiro Kuroda MS</td>
<td>FEM-Based Interaction Model Between Elastic Objects for Indirect Palpation Simulator</td>
</tr>
<tr>
<td>2:45</td>
<td>Bruce M. Cameron MS</td>
<td>Patient Specific Dynamic Geometric Models from Sequential Volumetric Time Series Data</td>
</tr>
<tr>
<td>3:00</td>
<td>Alessandro Faraci MSc</td>
<td>Soft Tissue Deformation Using a Hierarchical Finite Element Model</td>
</tr>
</tbody>
</table>

#### Break

### THURSDAY AFTERNOON SESSION C

#### SESSION C – WORKSHOP-PANEL

<table>
<thead>
<tr>
<th>Time</th>
<th>Presentation Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:15 - 2:30</td>
<td>Evaluation and Validation Standards and Guidelines for Operating Room of the Future R &amp; D</td>
</tr>
</tbody>
</table>

See "Special Activities" for additional information.

### THURSDAY AFTERNOON POSTERS

#### POSTER SESSION

<table>
<thead>
<tr>
<th>Time</th>
<th>Poster Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:45 - 6:00</td>
<td>During this session, authors will discuss their research person-to-person with conference participants. Posters will be judged and the best posters awarded prizes and the opportunity to give &quot;bullet&quot; presentations in the Friday afternoon general session. Poster presentations are:</td>
</tr>
</tbody>
</table>
|       | Antonia Anogeianaki BA  
|       | Physiology, Aristotle Univ of Thessaloniki |
|       | The Korydallos, Greece, Prisons Telemedicine System Experience: Why Technology Alone is Not a Sufficient Condition |
|       | George Anogeianakis MD PhD  
|       | Physiology, Aristotle Univ of Thessaloniki |
|       | Real Time Estimation of Physical Activity and Physiological Performance Reserves of Players During a Soccer Game |
George Anogianakis MD PhD
Physiology, Aristotle Univ of Thessaloniki
A Transnational Telemedicine Link Between Bulgaria and Greece

Marc Antoniujan Tresens
Electrical Engineering and Computer Science, Univ of California, Irvine
Hybrid-Reality: A Collaborative Environment for Biomedical Data Exploration Exploiting Two-Dimensional and Three-Dimensional Correspondence

Michelle M. Bagur BS
Ctr for Human Simulation, Univ of Colorado
Developing a User Interface for Teaching Diagnostic Arthroscopy Skills in a Virtual Environment

Mike Bailey PhD
San Diego Supercomputer Ctr, Univ of California
San Diego
Manipulation of Volume Data to Manufacture Vascular Replicas

Fernando Bello PhD
Surgical Oncology and Technology, Imperial Coll, London
Validation of Soft Tissue Properties in Surgical Simulation with Haptic Feedback

Joao Borelli MSc MEng
Mechatronics in Medicine Lab, Mechanical Engineering Dept, Imperial College, London
An Active Constraint Environment for Minimally Invasive Surgery: Early Experience on Cutting Operation

Chris Briscoe MA
Primal Pictures Ltd
Digital Human Anatomy

Kate Caldwell
Cambridge eScience Centre, Cambridge Univ
Telemedicine, Delivering Collaborative eScience

Thomas Preston Caudell PhD
Electrical and Computer Engineering, Univ of New Mexico
Distributed Interactive Virtual Environments for Collaborative Medical Education and Training: Design and Characterization

M. Cenk Cavusoglu PhD
Electrical Engineering and Computer Science, Case Western Reserve Univ
GIPSi: An Open Source / Open Architecture Software Development Framework for Surgical Simulation

Drew Cheng MD
Anesthesiology, Harbor-UCLA Medical Ctr
Utilization of the Head-Mounted Display in Clinical Anesthesiology Practice

Duncan Clarke PhD
Visualization & Vision Science, Univ of Kentucky
Reconstruction and Enhancement in Monocular Laparoscopic Imagery

Chris E. Constantineou PhD
Stanford Univ Medical School
Development of a Novel Surgical Support Instrument and Virtual System Incorporating New Tactile Sensor Technology

Vincenzo Costigliola MD
European Medical Association
COCOON Project: How to Reduce Risk in Medicine

Patrick Cregan MB BS FRACS
Wentworth Area Health Service
The VICCU Project - Application of Ultra-Broadband Internet for Simulated VR Training and Clinical Application in Complex Critical Environments

Lucio T. De Paolis
Innovation Engineering, Univ of Lecce, Italy
Computer-Based Simulator for Catheter Insertion Training

Venkat Devarajan PhD
Electrical Engineering, Univ of Texas at Arlington
Use of the Visible Human Dataset and 3D Studio Max to Model Laparoscopic Inguinal Herniorrhaphy

Extraction of Realistic Anatomical Texture from Visible Human Data for Laparoscopic Surgery Simulation

StapSim: A Virtual Reality Based Stapling Simulator for Laparoscopic Herniorrhaphy

Paola Di Giacomo PhD (Cand)
Ctr of Biomedical Research, Univ La Sapienza, Rome
An Instance of a Possible XML Schema for the ECG Telemetry
THURSDAY AFTERNOON POSTERS (CONT.)

Edward Dibble MEng
Mechanical Engineering, Imperial College, London
A One Degree of Freedom Haptic System to Investigate Issues in Human Perception with Particular Application to Probing Tissue

Chris F. Dickhaus, Dipl.-Wl.-Ing.
Surgical Planning Laboratory, Brigham and Women’s Hospital, Harvard Medical Sch
Workflow Modeling and Analysis of Computer Guided Prostate Brachytherapy Under MR Imaging Control

Warren E. Dixon PhD
Engineering Science and Technology Division, Oak Ridge National Laboratory
Automated Kinematic Generator for Surgical Robotic Systems

Alternative Operator Interface Concepts for Telesurgery

Todd C. Doehring PhD
Biomedical Engineering, Lerner Research Inst, Cleveland Clinic Foundation
Advanced 3D Poroviscoelastic Models for Soft Tissue: Implications for Haptic Interfaces

Ann E. Elsner PhD
Scheppens Eye Research Inst, Harvard Medical Sch
Visualization of Two Image Variables Simultaneously Using Cardinal Directions of Color Vision

Alessandro Faraci MSc
Surgical Oncology and Technology, Imperial College, London
Segmentation and Generation of Patient-Specific 3D Models of Anatomy for Surgical Simulation

Sandra Fowler BS
RDE Command, Orlando, FL
How Simulation is Training the Army’s New 91W

Reinhard Friedl MD
Heart Surgery, Univ Hospital of Ulm
Multimedia-Driven Teaching Significantly Improves Understanding of Procedures in Heart Surgery when Compared to Print-Media

Yael Friedman PhD
Simbionix USA Corp
Developing a Computerized Simulator for Endoscopic Ultrasound (EUS)

Paul Gasson PhD (Cand)
Sch of Computing Sciences, Univ of East Anglia
Introducing a Novel Haptic Interface for the Planning and Simulation of Open Surgery

Karim A. Gawad MD
Surgery, Univ Hospital Eppendorf
Multimedia Symposiaware - A Tool For Better Medical Education?

Chris Gunn BE
Mathematics and Information Sciences, CSIRO
Surgical Training Using Haptics Over Long Internet Distances

Amin Hadadzadeh MS
Bio-Medical Engineering, Iran Univ of Science & Technology
A Simulation Study on Transcellular and Transcapillary Fluid Shifts Induced by Hemodialysis

Blake Hanaford PhD
Electrical Engineering, Univ of Washington
Quantifying Grasping Mechanics in Laparoscopic Surgery Using the Blue DRAGON System

Andrew E. Healey MB ChB BSc DMRD FRCR
Interventional Radiology, Royal Liverpool Univ Hospital, UK
Challenges in Realising Effective Radiological Interventional Virtual Environments - The CRIVE Approach

Carol Heiser RN ND
Immersion Medical
An Advanced Hysteroscopy Training Simulation System

Jürgen Hesser PhD
Inst for Computational Medicine, Univ Mannheim
Cath - From Patient Data Generation to Cardiovascular Training Systems

Nayyar A. Hussain BBMed
Surgery, Trinity College, Dublin
eSurgery: Applied use of Digital Video, CGI Animation and Internet Streaming Media for Teaching Clinical and Surgical Skills to Medical Students and Interns

Sung Bae Hwang BS
Anatomy, Ajou Univ Sch of Medicine
Virtual Dissection and Endoscopy Software Developed on the Basis of the New Anatomical and Segmented Images of Korean Entire Body
THURSDAY AFTERNOON POSTERS (CONT.)

Sung Bae Hwang BS
Anatomy, Ajou Univ Sch of Medicine
Segmented Images and 3D Images for Studying the Anatomical Structures in MRIs of Entire Body

Bei Jin MS
Bioengineering, Univ of Illinois at Chicago
Virtual Reality Simulation of Eye Diseases

Nigel W. John PhD
Sch of Informatics, Univ of Wales, Bangor
Medical Visualization Across the Computational Grid

Raleigh F. Johnson PhD
Radiology, UTMB
3-D CT and MR Imaging of A Pygmy Sperm Whale Nicknamed “The Firecracker Whale”

DB Kannon PhD
Computer Aided Surgery, Inc.
DECODING the Digital Human: A Digital Morse Theory INDEX into Visible Human Dataset

Madeleine Keehner PhD
Psychology, Univ of California, Santa Barbara
Cognitive Factors and Interactivity: Implications for the Design and Implementation of 3D Computer Visualizations for Medical Education

Sun I. Kim PhD
Biomedical Engineering, Hanyang Univ
The Development of a Virtual Reality System for the Cognitive Behavioral Assessment and Therapy of Schizophrenia

Takamitsu Kondo
Intelligent Systems, IEEE, Kyushu Univ
A Study of Overlapping Virtual Objects on Real Objects in 3D Space

S.N. Ragu Kumar MSc MPhil MBA
Computer Facility, All India Inst of Medical Sciences,
A Pilot Study on the Perception of Health Care Professionals Towards Telemedicine in Health care Services in India

Kishalay Kundu MSc
Computer Science and Electrical Engineering, Univ of Maryland Baltimore County
Experimental Design to Study Effects of System Latencies on Human Performance in Interactive Graphics and Haptics

Christophe R. Laurent MD
Emergency Medicine, Monica General Hospital
A New Form of Application Service Provider (ASP) in the Development of Data Systems and Data Flow and Management of Data in (Multiple Campus) Health Care Institutions

Doo Yong Lee PhD
Mechanical Engineering, Korea Advanced Inst of Science and Technology
Interactive Haptic Modeling of Colon and Colonoscope

Polystimi Leonardou MD
Gen Hosp of Athens ‘G Gennimatas’ / Univ of Athens
The Virtual Colonoscopy as a New Imaging Modality in the Follow-Up of the Postcolectomy Patients

Harold W. Lewis III PhD
Systems Science, SUNY-Binghamton
Telerobotic Surgery: An Intelligent Systems Approach to Mitigate the Adverse Effects of Communication Delay

Bin Li
Ontar Corporation
Agent-Based Medical Guideline Simulation Framework

John S. Maier MD PhD
Biomedical Applications, ChemImage Corporation
Biomedical Applications of Raman Spectroscopy and Raman Chemical Imaging

Ramesh Makam DNB
Bangalore Endoscopic Surgery Training Inst & Research Centre
Training and Assessment of Psychomotor Skills for Performing Laparoscopic Surgery Using BEST-IRIS Virtual Reality Training Module

Maud Marchal MS
GMCAO, TIMC Laboratory, Grenoble
A One-DOF Free-Hand Haptic Device for Robotic Tele-Echography

Marco Masseroli PhD
Bioengineering, Politecnico di Milano
WHILE: Web Health Information Linking and Exchanging

Arianob Mehrabi MD PhD
General, Visceral and Transplant Surgery, Univ of Heidelberg
Development of an Experimental Trainings Module for the Clinical Introduction of the DaVinci Robotic System in Visceral Surgery
THURSDAY AFTERNOON POSTERS (CONT.)

Arianeb Mehrabi MD PhD
General, Visceral and Transplant Surgery, Univ of Heidelberg
A New Way for Improving Information Dissemination in Endoscopic Surgery

Louise Moody PhD
Statistics, Univ of Warwick
Ensuring the Usability of a Knee Arthroscopy Simulator

A Flexible Virtual Reality Tutorial for the Training and Assessment of Arthroscopic Skills

Jesper Mosegaard MSc
Computer Science, Univ of Aarhus
Parameter Optimisation for the Behaviour of Elastic Models over Time

LR-Spring Mass Model for Cardiac Surgical Simulation

José Luis Mosso Vázquez MD
ISSTE / IMSS / CONACY
Hand-Free Navigation in Laparoscopy: New Concept

Megumi Nakao PhD
Medical Informatics, Kyoto Univ Hospital
Physics-Based Preoperative Approach Planning Using Hybrid Virtual Bodies

Günter Niemeyer PhD
Telebotics Lab, Mechanical Engineering Dept, Stanford Univ
THUMP: An Immersive Haptic Console for Surgical Simulation and Training

Sarah M. North EdD
Computer Science and Information, Clark Atlanta Univ
Virtual Reality Combats Test Anxiety: A Case Study Report

Allison Okamura PhD
Mechanical Engineering, The Johns Hopkins Univ
Haptic Rendering of Tissue Cutting with Scissors

Lucian Panait MD
Surgery, Virginia Commonwealth Univ
Surgical Skill Performance Validation with Digital Video Display

Andrew Phelps
Sch of Medicine, Univ of California, San Diego
Passive vs. Active Virtual Reality Learning: The Effects on Short- and Long-Term Memory of Anatomical Structures

Francesco Pincirolli
Bioengineering, Politecnico di Milano
BIRD: Bio-Image Referral Database
A 3D Interactive Multimodal Viewer as Data Mining Tool for the Visible Human Dataset Color Images

Sonia Pujol PhD (Cand)
TIMC-GMCAO Laboratory, Grenoble
A Virtual Reality Based Navigation System for Endovascular Surgery

Azhar Rafiq MD
Medical Informatics and Technology Applications Consortium, Dept of Surgery, Virginia Commonwealth Univ
Evaluation of Virtual Reality Surgical Training in Microgravity

Steffan G.J. Rödel MD
Surgery, Medical Spectrum Twente
An Expert System for Risk-Evaluation of Endovascular Stent Prosthesis Placement

Stanley M. Saiki, Jr MD
Medicine, Univ of Hawaii
Realization of Abstract Bio-Medical Concepts in Interactive Virtual Environments to Enhance Learning: A Renal Fly-Through Model

Armen Sarvazyan PhD DSc
Medical Tactile, Inc. / Artann Laboratories, Inc.
Tactile Sensors in Medical Diagnostics

Sudhanshu Kumar Semwal PhD
Computer Science, Univ of Colorado
An Exploration of the Application of Wearable Computing Techniques to Knee Replacement Implants

Jennifer Simpson
Scientific Computing and Imaging Inst, Univ of Utah
Annot3D: Annotation and Packaging of 3D Visualizations for Educational Purposes

Karisa Solt
Biomedical Engineering, New Jersey Inst of Technology
Design of a Hybrid-Virtual, Computer-Assisted Knee Injection Model for Orthopaedic Surgical Simulation
THURSDAY AFTERNOON POSTERS (CONT.)

Sylvia Stracke MD
Nephrology, Univ Hospital Ulm
Teaching Nephrology Using LaMedica - An Online Multimedia Educational System Integrated into the Curriculum

Ségolène Tarte, Dipl.-Math. Eng.
Inst for Surgical Technology and Biomechanics, M.E. Müller Research Ctr for Orthopaedic Surgery
CT-Based Diagnosis, Planning, Simulation and Education Tool for Complex Orthopaedic Trauma Surgery

Timo H. Tossavainen MSC
Computer and Information Sciences, Univ of Tampere
Comparison of CAVE and HMD for Visual Stimulation in Human Postural Control Research

Feras M. Toufaili MS
Mechanical Engineering, Univ of Washington
Simulation of Vision Loss

Jakob T. Valvoda, Dipl.-Inform.
VR Group, Ctr for Computing and Communication, Aachen Univ
Reaction-Time Measurement and Real-Time Data Acquisition for Neuroscientific Experiments in Virtual Environments

Mike J.F. Van der Geer MSC
Radiology, Erasmus MC - Univ Medical Ctr Rotterdam
The Virtual In Situ Image Navigation Interface (VISINI) for 3D Interaction with Radiological Imaging Data

Ivan Vacerina MD
xitact S.A.
Compound Anatomical Structures and Large Tissue Distortions in Haptic Laparoscopic Surgery Simulators

Raquel Viciana-Abad MSc
Tecnología Electrónica, Univ of Málaga
A Preliminary Study of Presence in Virtual Reality Training Simulation for Medical Emergencies

Bruce Watson
Univ Dept of Surgery, Manchester Royal Infirmary
The Effect of Music and Noise on Simulated Surgical Performance (LapSim) - New Tunes For Simulators?

Roger Webster PhD
Computer Science, Millersville Univ
A Haptic Surgical Simulator for the Capsulorhexis Procedure in Cataract Surgery

Yongming Xie
Computer Science & Engineering, Chinese Univ of Hong Kong
Interactive Cutting Simulation with Adaptive Refinements Using Digital Logic Design Analogy

Level Set Based Auto Segmentation of the Tagged Left Ventricle MR Images

Sun Young Yi MD PhD
Internal Medicine, Ewha Womans Univ
Endoscopy Training Simulator with Haptic Fidelity

Hui Zhang M.A.Sc.
Engineering, Simon Fraser Univ
Acquiring Laparoscopic Manipulative Skills: A Virtual Tissue Dissection Training Module

Zhan Zhang PhD
High Performance Computing & Communications, National Library of Medicine, NIH
Toward Rapidly Displaying and Flexibly Viewing Anatomic Objects Online

Aleksander Zivanovic PhD
Mechanical Engineering, Imperial Coll, London
Novel Force Resolver Designs for a Haptic Surgery Simulator

THURSDAY EVENING 1/15/04

EXHIBITOR RECEPTION

6:00 – 7:00 PM

* Not a CME activity
<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker/Title/Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:55</td>
<td>Moderator's Welcome</td>
</tr>
</tbody>
</table>
| 8:00  | Thenkurussi Kesavadas PhD, Mechanical and Aerospace Engineering, State Univ of New York at Buffalo  
A Prototype Virtual Reality System for Preoperative Planning of Neuro-Endovascular Interventions |
| 8:15  | Walae Khaled, Dipl.-Ing., Electrical Engineering, High Frequency Eng Inst, Ruhr-Univ Bochum  
A New Approach: Palpation Imaging Using a Haptic System for Virtual Reality Applications in Medicine |
| 8:30  | Christian Dold, Dipl.-Ing., Cognitive Computing and Medical Imaging, Fraunhofer Inst for Computer Graphics  
The Compensation of Head Motion Artifacts Using an Infrared Tracking System and a New Algorithm for fMRI |
| 8:45  | Andrew T. Miller PhD, Computer Science, Columbia Univ  
In-Vivo Stereoscopic Imaging System with 5 Degrees-of-Freedom for Minimal Access Surgery |
| 9:00  | Abhilash Pandya PhD (Cand), Electrical and Computer Engineering, Wayne State Univ  
Development and Human Factors Analysis of Neuronavigation vs. Augmented Reality |
| 9:15  | Jeremy Ackerman PhD, Sch of Medicine, Univ of North Carolina at Chapel Hill  
Building a Laparoscopic Range Imager: Enabling Technology for VR/AR-Assisted Laparoscopy |
| 9:30  | Sebastian Vogt, Dipl.-Inform., Imaging & Visualization, Siemens Corporate Research  
An AR System with Intuitive User Interface for Manipulation and Visualization of 3D Medical Data |
| 9:45  | Gregory D. Hager PhD, Computer Science, Johns Hopkins Univ  
Real-Time Biomedical Surface Tracking in Stereo Microscopy |
| 10:00 | Break                                                                                   |
| 10:15 | Neil D. Glossop PhD, Traxtal Technologies Inc.  
Augmented Reality Laser Projection Device for Surgery |
| 10:30 | Mark C. Preul MD, Neurosurgery Research, Barrow Neurological Inst  
An Improved Intraoperative Recorded Imaging Experience: Stereoscopic QTVR in Neurosurgery |
| 10:45 | Megumi Nakao PhD, Medical Informatics, Kyoto Univ Hosp  
Practical Haptic Navigation with Clickable 3D Region Input Interface for Supporting Master-Slave Type Robotic Surgery |
| 11:00 | Masaya Kitagawa MS, The Johns Hopkins Univ  
Effect of Sensory Substitution on Suture Manipulation Forces for Surgical Teleoperation |
| 11:15 | Naoki Suzuki PhD MD, Inet for High Dimensional Medical Imaging, Jikei Univ Sch of Medicine  
VR Navigation Function for an Endoscopic Robot System for Gastric Tube Surgeries |
| 11:30 | Mark E. Rentschler MS, Biomedical Engineering, Univ of Nebraska  
In Vivo Robots for Laparoscopic Surgery |
| 11:45 | Break                                                                                   |
## FRIDAY MORNING SESSION B

### SESSION B: SURGICAL SIMULATION - EDUCATION ISSUES & DESIGN

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker</th>
<th>Institution/Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:45</td>
<td>Warren D. Smith PhD</td>
<td>Biomedical Engineering, California State Univ, Sacramento</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>A Simple Virtual Instrument to Monitor Surgeons' Workload While They Perform Minimally Invasive Surgery Tasks</em></td>
</tr>
<tr>
<td>10:00</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Moderator</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Randy S. Haluck MD FACS</td>
<td></td>
</tr>
<tr>
<td>10:15</td>
<td>Nathan J. Delson PhD</td>
<td>Mechanical and Aerospace Engineering, Univ of California San Diego</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Method for Estimation In Vivo Stiffness Properties with both Sliding and Compression Forces During Laryngoscopy</em></td>
</tr>
<tr>
<td>10:30</td>
<td>Aristotelis Dosis MSc</td>
<td>Surgical Oncology &amp; Technology, Imperial College, London</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Real-Time Synchronization of Kinematic and Video Data for the Comprehensive Assessment of Surgical Skills</em></td>
</tr>
<tr>
<td>10:45</td>
<td>John Winder MSc</td>
<td>Life and Health Sciences, Univ of Ulster</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Increasing Face Validity of a Vascular Interventional Training System</em></td>
</tr>
<tr>
<td>11:00</td>
<td>Karl D. Reining PhD</td>
<td>Ctr for Human Simulation, Univ of Colorado</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Creating a High-Fidelity Virtual Environment for Practicing Diagnostic Arthroscopy Skills</em></td>
</tr>
<tr>
<td>11:15</td>
<td>Alex J. Lindblad MS</td>
<td>HIT Lab, Univ of Washington</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Two-Handed Next Generation Suturing Simulator</em></td>
</tr>
<tr>
<td>11:30</td>
<td>Break</td>
<td></td>
</tr>
</tbody>
</table>

## FRIDAY MORNING SESSION C

### SESSION C – WORKSHOP AND TUTORIAL

<table>
<thead>
<tr>
<th>Time</th>
<th>Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00</td>
<td>Medical Simulation—The State-of-the-Art and Beyond</td>
</tr>
<tr>
<td>10:00</td>
<td>Break</td>
</tr>
<tr>
<td>11:45</td>
<td>Resume</td>
</tr>
</tbody>
</table>

*See “Special Activities” for additional information.*
### FRIDAY AFTERNOON 1/16/04

**GENERAL SESSION**

**Moderator**  
Rainer M.M. Seibol MD

1:00  **Poster Winners’ “Bullet” Presentations and Prizes**

1:20  **Featured Session: Surgical Simulation:**  
*It's Not About Technology; It Is About Education*  
*See “Special Activities” for additional information.*

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:55</td>
<td>Panel Discussion</td>
</tr>
<tr>
<td></td>
<td><em>Additional Panelists:</em></td>
</tr>
<tr>
<td></td>
<td>Gerald R. Moses PhD</td>
</tr>
<tr>
<td></td>
<td>Clinical Applications Division, TATRC</td>
</tr>
<tr>
<td></td>
<td>Anthony G. Gallagher PhD</td>
</tr>
<tr>
<td></td>
<td>Emory Endosurgery Unit, Emory Univ</td>
</tr>
<tr>
<td>5:25</td>
<td>Ajit K. Sachdeva MD FRCSC FACS</td>
</tr>
<tr>
<td></td>
<td>Education, American Coll of Surgeons</td>
</tr>
<tr>
<td></td>
<td><em>Summary</em></td>
</tr>
<tr>
<td>5:40</td>
<td>Break</td>
</tr>
</tbody>
</table>

### SATURDAY MORNING 1/17/04

**SESSION A: STEREOSCOPY - THE 5TH ANNUAL BARCO STEREOSCOPY SESSION**

**Session Chair**  
Steven Senger PhD

**Moderator**  
Victor M. Spitzer PhD

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:20</td>
<td>Richard M. Satava MD FACS</td>
</tr>
<tr>
<td></td>
<td>Surgery, Univ of Washington; DARPA; TATRC/USAMRMN</td>
</tr>
<tr>
<td></td>
<td><em>From Validation Studies to Implementation: How Do We Proceed?</em></td>
</tr>
<tr>
<td>1:30</td>
<td>Ajit K. Sachdeva MD FRCSC FACS</td>
</tr>
<tr>
<td></td>
<td>Div Education, American Coll of Surgeons</td>
</tr>
<tr>
<td></td>
<td><em>Assurance of Competence and Patient Safety through Simulation: The Evidence and the Promise</em></td>
</tr>
<tr>
<td>2:00</td>
<td>Steven L. Dawson MD</td>
</tr>
<tr>
<td></td>
<td>CIMIT; Massachusetts General Hosp; Harvard Univ, MIT</td>
</tr>
<tr>
<td></td>
<td><em>Waiting for GO: The Research Challenges Before Us</em></td>
</tr>
<tr>
<td>2:40</td>
<td>David H. Wilks MD</td>
</tr>
<tr>
<td></td>
<td>Anesthesiology, Univ of New Mexico Sch of Medicine</td>
</tr>
<tr>
<td></td>
<td><em>The Science of Education; The Science of Learning</em></td>
</tr>
<tr>
<td>3:20</td>
<td>Break</td>
</tr>
<tr>
<td>3:35</td>
<td>Donald A. Risucci PhD</td>
</tr>
<tr>
<td></td>
<td>Educational Research/Surgery, New York Medical Coll</td>
</tr>
<tr>
<td></td>
<td><em>What Is It; How Do We Do It?</em></td>
</tr>
<tr>
<td>4:15</td>
<td>Daniel J. Scott MD</td>
</tr>
<tr>
<td></td>
<td>Tulane Ctr for Minimally Invasive Surgery, Tulane Univ Sch of Medicine</td>
</tr>
<tr>
<td></td>
<td>Neal Seymour MD FACS</td>
</tr>
<tr>
<td></td>
<td>Surgery, Baystate Health System</td>
</tr>
<tr>
<td></td>
<td><em>Bite the Bullet; See the Rewards</em></td>
</tr>
<tr>
<td>7:55</td>
<td>Andrew Joel</td>
</tr>
<tr>
<td></td>
<td>BARCO Simulation Products</td>
</tr>
<tr>
<td></td>
<td><em>Introduction to Stereoscopic Projection Technology</em></td>
</tr>
<tr>
<td>8:10</td>
<td>Malte Westerholf</td>
</tr>
<tr>
<td></td>
<td>Indeed - Visual Concepts GmbH</td>
</tr>
<tr>
<td></td>
<td><em>From Micro to Macro: 3D Data and Stereoscopic Viewing in Bio-Medical Research</em></td>
</tr>
<tr>
<td>8:25</td>
<td>Brian P. Kritzstein</td>
</tr>
<tr>
<td></td>
<td>Battelle Memorial Inst</td>
</tr>
<tr>
<td></td>
<td>*Stereoscopic Visualization and Analysis of Text-Based Medical Data Using the Starlight Informa-</td>
</tr>
<tr>
<td></td>
<td><em>tion Visualization System</em></td>
</tr>
<tr>
<td>8:40</td>
<td>Hans Lamecker, Dipl. Phys.</td>
</tr>
<tr>
<td></td>
<td>Scientific Visualization, Zuse Inst Berlin</td>
</tr>
<tr>
<td></td>
<td><em>Visualization of the Variability of 3D Statistical Shape Models by Animation</em></td>
</tr>
<tr>
<td>8:55</td>
<td>DB Karron PhD</td>
</tr>
<tr>
<td></td>
<td>Computer Aided Surgery, Inc.</td>
</tr>
<tr>
<td></td>
<td><em>Visiting the Decoded Digital Human</em></td>
</tr>
</tbody>
</table>
SATURDAY MORNING SESSION A (CONT.)

9:10  Roger Phillips PhD MBCS
      Simulation & Visualization Group, Univ of Hull (UK)
      Immersive Visualization of Patient-Specific
      Intensity Modulated Radiotherapy (IMRT)
      Treatment Plans for Education and Training

9:25  Jonathan C. Silverstein MD
      Surgery, The Univ of Chicago
      Enhancing Radiological Volumes with Symbolic
      Anatomy Using Image Fusion and Collaborative
      Virtual Reality

9:40  Mike Bailey PhD
      San Diego Supercomputer Ctr, Univ of California
      San Diego
      Realtime Volume Interaction and Its Role in Cance
      Research

9:55  Tore Nilsson DDS
      Oral and Maxillofacial Radiology, Umeå Univ
      Virtual Radiography

10:10 Break

Moderator
Steven Senger PhD

10:25  Eric Herbranson DDS
       Endodontics, Univ of the Pacific Sch of Dentistry
       The Three-Dimensional Computer Model - The
       Art and the Science

10:40  Victor M. Spitzer PhD
       Ctr for Human Simulation, Univ of Colorado Sch of
       Medicine
       VH Dissector: A Platform for Curriculum
       Development and Presentation for the
       Anatomical Arts and Sciences

10:55  Michael J. Mastrangelo MD
       Oregon Health & Science Univ
       A Novel Immersive Stereoscopic Tele-Collabora-
       tion Utilizing Volumetric Medical Imaging

11:10  Pheng Ann Heng PhD
       Computer Science & Engineering, The Chinese Univ of
       Hong Kong
       PC-Based Real-Time Stereoscopic Volume Vis-
       sualization of Multi-Gigabyte Digital Human Data

11:25  Break

SATURDAY MORNING SESSION B

SESSION B: SURGICAL SIMULATION - SYSTEMS, ASSESSMENT & VALIDATION

9:00  Jurjen Zoethout PhD
      Research & Development, xitact S.A.
      A Novel Tool for the Development of a Common
      Haptic VR-Platform for Minimally Invasive
      Surgical Training

8:15  Reinhard Maenner PhD
      Computer Science 5, Univ of Mannheim
      EYESI - Ophthalmo-Surgery in Cyberspace

8:30  Tobias Obst, Dipl.-Ing. Univ.
      Orthopaedic Clinic, Technical Univ Munich
      The Delivery-Simulator: A New Application of
      Medical VR

8:45  Kenneth J. Waldron PhD DEng
      Mechanical Engineering, Stanford Univ
      Performance Characteristics of the Immersion
      Bimanual Surgical Simulation Interface

9:00  Dmitriy Oleynikov MD
      Surgery, Univ of Nebraska Medical Ctr
      Objective Skill Assessment Using da Vinci Surgi-
      cal System in 2D vs 3D by Flight Path Analysis

9:15  Atul K. Madan MD
      Surgery, Univ of Tennessee
      Substituting Virtual Reality Trainers for Inanimate
      Trainers Does Not Decrease Laparoscopic Skill
      Acquisition

9:30  Yasushi Yamauchi PhD
      Inst for Human Science & Biomedical Engineering,
      National Inst of Advanced Industrial Science and
      Technology (AIST)
      An Endoscopic Sinus Surgery Training System
      for Assessment of Surgical Skill

9:45  Mark W. Scerbo PhD
      Psychology, Old Dominion Univ
      A Comparison of the CathSim System and Simu-
      lated Limbs for Teaching Intravenous Cannulation

10:00 Fernando Bello PhD
      Surgical Oncology and Technology, Imperial Coll, London
      Evaluation of the Benefit of VR Simulation in a
      Multi-Media Web-Based Educational Tool
SUNDAY MORNING SESSION A + B

SESSION A + B - PANEL DISCUSSION

11:30 Panel Discussion: MMVR12 Conference Summary by past Satava Awardees

Panelists

Michael J. Ackerman PhD
National Library of Medicine

Wm. LeRoy Heinrichs MD PhD
Stanford Univ School of Medicine

Richard A. Robb PhD
Mayo Clinic College of Medicine

Richard M. Satava MD FACS
Univ of Washington; TATRC; DARPA

Faina Shtern MD
Beth Israel Deaconess; Harvard Medical School

Victor M. Spitzer PhD
Univ of Colorado School of Medicine

Dave Warner MD PhD
MindTel; Syracuse Univ; Inst for Interventional Informatics

Suzanne J. Weghorst MA MS
Univ of Washington

12:30 Adjourn