Important: *Program is subject to change to accommodate programming and presenter needs. Please check back for updates.*

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**Medicine Meets Virtual Reality 14**

*Accelerating Change in Healthcare: Next Medical Toolkit*

January 24 – 27, 2006

Hyatt Regency Long Beach
Long Beach, California

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**CONFERENCE AT A GLANCE**

**MONDAY, January 23**

All Day
Creating Games & Simulation for Learning: 2nd Annual TATRC West / SUMMIT Workshop at MMVR


**TUESDAY, January 24**

All Day
TATRC Day at MMVR *

*Organized by the Telemedicine & Advanced Technologies Research Center (TATRC), US Army Medical Research & Materiel Command*

Morning
Virtual Soldier Update †

Afternoon
Virtual Autopsy Update †
Trauma Pod Update †

*Updates organized by DARPA/Defense Sciences Office*
**WEDNESDAY, January 25**

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<tr>
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<th>Plenary: MMVR Opens; ICCAS</th>
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<td>A: Education &amp; Simulation</td>
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**THURSDAY, January 26**

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<tr>
<th>Morning</th>
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<td>D: Integrating TATRC &amp; DARPA Technologies *†</td>
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<tr>
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<td><strong>Afternoon</strong></td>
<td>Plenary: Rehabilitation; Satava Award; Intelligent Tutoring †</td>
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<td>Late Afternoon</td>
<td>Exhibits Close</td>
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<tr>
<td><strong>Evening</strong></td>
<td>Poster Session (Group 2)</td>
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**FRIDAY, January 27**

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<td>C: Interoperability Standards for MM&amp;S *</td>
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<td><strong>Afternoon</strong></td>
<td>A: Surgical Simulation-Validation, Future</td>
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<td>B: Serious Games</td>
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<td>C: Biodefense</td>
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* Organized in partnership with TATRC
† Organized in partnership with DARPA
FULL SCHEDULE

Wednesday, January 25

Wednesday Morning General Session

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

8:10 Special Invited Speaker TBA

8:30 George Berci MD FACS FRCS Ed (Hon.)
Surgery, Cedars-Sinai Medical Ctr [US]
The Impact of Video Technique in Anesthesia

8:45 Gregory S. Fischer MSE
Computer Integrated Surgery ERC, Johns Hopkins Univ [US]
Image Overlay Guidance for MRI Arthrography Needle Insertion

9:00 Chris J. Hughes BSc
School of Informatics, University of Wales, Bangor [UK]
A Flexible Infrastructure for Delivering Augmented Reality Enabled Transcranial Magnetic Stimulation

9:15 Anuj Taneja BTech
Mechanical & Aerospace Engineering, Univ of California, Irvine [US]
Catheter-Guided Drug Delivery System - A New Generation of Biomedical Micro-Devices

9:30 Robert J. Stone Msc
Human Interface Technologies Team, Univ of Birmingham [UK]
Interactive Trauma Simulation Using Games Engine Technologies: A Human-Centred Case Study

9:45 James A. Bacon MS
Energid Technologies [US]
The Surgical Simulation and Training Markup Language (SSTML): An XML-Based Language for Medical Simulation

10:00 Minho Kim MS
CISE, Univ of Florida [US]
Exploiting Graphics Hardware for Haptic Authoring

10:15 Steve Dawson MD
CIMIT [US]
AIMS Update on Simulation Funding

10:30 Break [Extended]
**General Session**, continued

*The Innovation Center Computer Assisted Surgery (ICCAS), Leipzig, Germany*

Session Chairs: Juergen Meixensberger MD & Andreas Dietz MD

11:00 Jürgen Meixensberger MD  
ICCAS/Neurosurgery, Univ of Leipzig [DE] &  
Heinz U. Lemke PhD  
Inst for Technical Informatics, Technical Univ Berlin [DE]  
ICCAS - A New Interdisciplinary Research Setting for CAS

11:15 Oliver Burgert PhD  
ICCAS, Univ of Leipzig [DE]  
Surgical Workflow Modeling

11:30 Werner Korb PhD  
ICCAS, Univ of Leipzig [DE]  
Surgical PACS for the Digital Operating Room

11:45 Discussion

12:00 Break

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**Wednesday Afternoon, Session A**

*Education & Simulation*

1:25 Moderator’s Welcome

1:30 Jonathan C. Silverstein MD  
Surgery, Univ of Chicago [US]  
Web-Based Viewer for Systematic Combination of Anatomy and Nomenclature

1:45 Brittany S. Hampton MD  
Obstetrics & Gynecology, Div of Reconstructive Pelvic Surgery & Urogynecology, New York Univ Hospital [US]  
Construction of a Web-Based Virtual Pelvis Trainer

2:00 Mark Bowyer MD FACS  
National Capital Area Medical Simulation Ctr, Uniformed Services Univ [US]  
Combining High Fidelity Patient Simulation with a Standardized Family Member: A Novel Mixed Reality Approach to Teaching Breaking Bad News

2:15 Matt Kaufman MS  
Forterra Systems, Inc. [US]  
Team Training of Medical First Responders for CBRNE Events Using Multiplayer Game Technology
2:30 N. Ty Smith MD  
Anesthesia, Univ California, San Diego (Retired) [US]  
Worst-Case Scenario: Battlefield Injury/Can’t Intubate

2:45 Victor M. Vergara MS  
Electrical & Computer Engineering, Univ of New Mexico [US]  
Flatland Sound Services Design Supports Virtual Medical Training Simulations

3:00 Panaitios PhD  
Electrical & Computer Engineering / Music, Univ of New Mexico [US]  
Using Algorithmically Generated Music to Enhance VR Nephron Simulation

3:15 Break

3:30 Robert F. Dickerson BS  
Computer & Information Science/Engineering, Univ of Florida [US]  
Virtual Patients: Assessment of Synthesized Versus Pre-Recorded Speech

3:45 Frederic D. McKenzie PhD  
Electrical & Computer Engineering, Old Dominion Univ [US]  
Medical Student Evaluation Using Augmented Standardized Patients: Preliminary Results

4:00 Tiffany Grunwald MEd  
Plastic & Reconstructive Surgery, Keck Sch of Medicine, Univ Southern California [US]  

4:15 Dale C. Alverson MD  
Ctr for Telehealth & Cybermedicine Research, Univ of New Mexico [US]  
Reification of Abstract Concepts to Improve Comprehension Using Interactive Virtual Environments and a Knowledge-Based Design: A Renal Physiology Model

4:30 Karl D. Reinig PhD  
Ctr for Human Simulation, Univ of Colorado [US]  
Creating and Displaying Virtual Trauma in Models Derived from the Visible Human

4:45 Pheng-Ann Heng PhD  
Computer Science & Engineering, Chinese Univ of Hong Kong [HK]  
Virtual Acupuncture Human Based on Chinese Visible Human Dataset

5:00 Discussion

5:15 Break

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**Wednesday Afternoon, Session B**

**Modeling**

1:25 Moderator’s Welcome

1:30 Roy Kerckhoffs PhD  
Bioengineering, Univ of California, San Diego [US]  
From Myocyte to Torso: Spatially and Temporally Multi-Scale Simulation of Cardiac Injury

1:45 Martin Berzins PhD  
SCI Inst, Univ of Utah [US]  
Ballistic Injury Simulation Using the Material Point Method

2:00 Michel A. Audette PhD  
Surgical Assist Group, AIST [JP]  
A Topologically Faithful, Tissue-Guided, Spatially Varying Meshing Strategy for the  
Computation of Patient-Specific Head Models for Endoscopic Pituitary Surgery Simulation

2:15 Timothy P. Kelliher  
Imaging Technologies, GE Global Research [US]  
Computer-Aided Forensics: Facial Reconstruction

2:30 Xunlei Wu PhD  
Simulation Group, Massachusetts General Hospital [US]  
Smooth Vasculature Reconstruction from Patient Volume Data

2:45 Denis Laroche MASc  
National Research Council Canada [CA]  
Computer Prediction of Balloon Angioplasty from Artery Imaging

3:00 Balakrishna Haridas PhD  
Biomedical Engineering, Colleges of Medicine & Engineering, Univ of Cincinnati [US]  
PelvicSim - A Computational-Experimental System for Biomechanical Evaluation of Female  
Pelvic Floor Organ Disorders and Associated Minimally Invasive Interventions

3:15 Break

3:30 Woojin Ahn PhD (Cand)  
Mechanical Engineering, Korea Advanced Inst of Science & Technology [KR]  
Centerline-Based Parametric Model of Colon for Colonoscopy Simulator

3:45 Bruce M. Cameron MS  
Biomedical Imaging Resource, Mayo Clinic College of Medicine [US]  
Tissue Engineering Templates Using Minimal Surfaces

4:00 Michael Wehner BS  
Mechanical Engineering, Univ of California Berkeley [US]  
Geometric Nonlinearity: Is it Important for Real-Time FEM Surgical Simulation?
4:15 Venkat Devarajan PhD
Electrical Engineering /Bio-Med, Univ of Texas at Arlington [US]
Selective Tessellation Algorithm for Modeling Interactions Between Surgical Instruments and Tissues /
Physically Accurate Mesh Simulation in a Laparoscopic Hernia Surgery Simulator

4:30 Alan Liu PhD
National Capital Area Medical Simulation Ctr, Uniformed Services Univ [US]
Bounds for Damping that Guarantee Stability in Mass-Spring Systems

4:45 Bryan C. Lee PhD (Cand)
BioMedIA Lab, CSIRO ICT Ctr [AU]
Efficient Topology Modification and Deformation for Finite Element Models Using Condensation

5:00 Discussion

5:15 Break

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Wednesday Afternoon, Session C

Workshop:

Patient Safety and Medical Simulation: Challenges and Opportunities

Alan Liu PhD
National Capital Area Medical Simulation Center

Mark Bowyer MD FACS
National Capital Area Medical Simulation Center

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Wednesday Evening

Poster Session – Group 1

5:15 – 6:15 PM

Education

Corinne E. Collier BSc
Creative Technologies, Univ of Portsmouth [UK]
The Effect of Virtual Immersive Scenarios in High Human Cost Task Based Learning

Judith E. Grunwald PhD
Speech Communication Studies, Iona College [US]
The Application of Virtual Reality in the Healthcare Communication Interaction
Claudia L. Johnston PhD
Special Projects, Texas A&M Univ - Corpus Christi [US]
Pulse!! - A Virtual Learning Space Project

Dale E. Olsen PhD
SIMmersion LLC [US]
Interactive Simulation Training: Computer Simulated Standardized Patients for Medical Diagnosis

Eric Savitsky
Emergency Medicine, Univ of California, Los Angeles Medical Ctr [US]
Natural Progression: Multimodal Education and Procedural Training

**Mental Health**

Cheryl A. Bolstad PhD
SA Technologies [US]
Medical Cognitive Readiness: From Theory to Practice

José Luis Mosso MD
Surgical/Endoscopy Depts,
National Medical Ctr la Raza IMSS; Clínica-Hospital A. Pisanty ISSSTE [MX]
Pain Reduction with Entertainment Game In: Upper Gastrointestinal Endoscopies Extensive Injuries Treatments in Infected Soft Tissues and Cervical Conization with Diathermy Loop

Giuseppe Riva PhD
Applied Technology for Neuro-Psychology Lab,
Istituto Auxologico Italiano [IT]
Stress Treatment Using UMTS Cellular Phones: A Controlled Trial

Morris Steffin MD
VRNEUROTECH [US]
Avionics-Compatible Video Facial Cognizer for Detection of Pilot Incapacitation

Jonathan L. Wright MD
Urology, Univ of Washington Medical Ctr [US]
Virtual Reality as an Adjunctive Pain Control During Transurethral Microwave Thermotherapy

**Modeling**

Fernando Bello PhD
Surgical Oncology & Technology, Imperial College London [UK]
Simulating Tele-Manipulator Controlled Tool-Tissue Interactions Using a Nonlinear FEM Deformable Model

Pei Chen PhD
Electrical & Computer Engineering, Univ of Delaware [DE]
A Mass-Spring Deformable Surface Model for Soft Tissue Simulation with Haptic Feedback

Kup-Sze Choi PhD
Computing, Hong Kong Polytechnic Univ [HK]
Simulation of Collaborative Soft-Tissue Deformation for Medical Training
Clément Forest PhD  
IRCAD [FR]  
Breath Modeling, Application to Ultrasound Simulation

Balakrishna Haridas PhD  
Biomedical Engineering, Colleges of Medicine & Engineering, Univ of Cincinnati [US]  
A New Experimental Methodology for In Vivo Measurement of Elastic and Viscoelastic Properties of Pelvic Floor Organs/Tissues

Don Hilbelink PhD  
College of Medicine, Dept Anatomy, Univ of South Florida [US]  
Wavelet Analysis of Heart Geometry for Morphological Modeling

Sebastian König Dipl-Inf  
Inst for Computational Medicine, Univ of Mannheim/ Univ Heidelberg [DE]  
3D Live-Wires on Mosaic Volumes

Alex J. Lindblad MSCE  
Human Interface Technology Lab, Univ of Washington [US]  
Real-Time Finite Element Based Virtual Tissue Cutting

Maud Marchal PhD (Cand)  
TIMC-GMCAO Lab [FR]  
A Discrete Soft Tissue Model for Simulating Complex Anatomical Environments

Maxwell L. Neal BS  
Bioengineering, Univ of Washington [US]  
Hemodynamics of Hemorrhage Simulated with an Open-Loop Cardiopulmonary Model

Edmond C. Prakash PhD  
Sch of Computer Engineering, Nanyang Technological Univ, Singapore [SG]  
Flat Maps: A Multi-Layer Parameterization for Surgery Simulation

Yingge Qu PhD (Cand)  
Computer Science & Engineering, Chinese Univ of Hong Kong [HK]  
Semi-Automatic Segmentation and Marking of CVH Data

Jing Ren  
Canadian Surgical Technology & Advanced Robotics (CSTAR) [CA]  
Rendering of Virtual Fixture for MIS Using Generalized Sigmoid Functions

Sascha Seifert Dipl-Inform  
Inst of Computer Science & Engineering, Univ Karlsruhe (TH) [DE]  
Soft Tissue Modeling Forum

Yuzhong Shen PhD  
Virginia Modeling, Analysis, & Simulation Ctr, Old Dominion Univ [US]  
Realistic Irrigation Visualization in a Surgical Wound Debridement Simulator

Ofek Shilon MSc  
Simbionix Ltd [IL]  
Simulating Bending Behaviour of Suturing Thread and Needle
Govindarajan Srimathveeravalli PhD (Cand)
Mechanical & Aerospace Engineering, State Univ of New York at Buffalo [US]
Parametric Patient Specific Modeling and Simulation of Trocar Insertion Using Reduced Basis Method

Michael Stoettinger Dipl-Ing
Medical Informatics, Upper Austrian Research [AT]
An Approach for Anthropometrically Correct 3D Adaptation of Human Body Models

**Surgical Simulation**

Christoph Aschwanden PhD (Cand)
John A. Burns Sch of Medicine, Univ of Hawaii at Manoa, Telehealth Research Inst [US]
A Surgical and Fine-Motor Skills Trainer for Everyone? Touch and Force-Feedback in a Virtual Reality Environment for Surgical Training

Ifesegun D. Ayodeji MD
General Surgery, Maxima Medical Ctr [NL]
Determination of Face Validity for the Simbionix Lap Mentor Virtual Reality Training Module

Lee A. Belfore II PhD
Electrical & Computer Engineering, Old Dominion Univ [US]
A Software Framework for Surgical Simulation Virtual Environments

Nathan D. Brown BS
Electrical Engineering & Computer Science, Case Western Reserve Univ [US]
Virtual Environment-Based Training Simulator for Endoscopic Third Ventriculostomy

Allen Burnett PhD
Learning Technologies, MountainTop Technologies, Inc. [US]
Virtual Medical Simulation Training for Nerve Block Anesthesiology

M. Cenk Cavusoglu PhD
Electrical Engineering & Computer Science, Case Western Reserve Univ [US]
Evaluation Methods of a Middleware for Networked Surgical Simulations

George Chami MD
Computer Science, Univ of Hull [UK]
Factors Affecting Targeting Using the Computer Assisted Orthopaedic Surgery System (CAOSS)

Chee-Kong Chui PhD
Mechanical Engineering, National Univ of Singapore [SG]
Integrative Haptic and Visual Interaction for Simulation of PMMA Injection During Vertebroplasty

Raymond Glassenberg MD
Anesthesiology, Northwestern Univ, Feinberg Sch of Medicine [US]
Virtual Epidural
Reidar Källström MD
Biomedicine & Surgery, Univ of Linköping [SE]
Development and Evaluation of a Novel Real-Time Simulation Model with Haptic Feedback for Training Transurethral Prostatic Surgery

José Luis Mosso MD
Surgical/Endoscopy Depts, National Medical Ctr la Raza IMSS; Clínica-Hospital A. Pisanty ISSSTE [MX]
Towards a Simulator of the Upper Gastrointestinal System

Daniel C. Shang BASc
Kinesiology, Univ of Waterloo [CA]
Modeling of a Laparoscopic Needle Driver: Implication for the Design of Virtual Reality Simulators

Mark Smith MD PhD
Medical Informatics & Advanced Laparoscopy, Banner Good Samaritan Medical Ctr, Phoenix [US]
Gesture Based Hand Movement Analysis and Haptic Feedback for Surgical Training

Hyun Soo Woo PhD (Cand)
Mechanical Engineering, Korea Advanced Inst of Science & Technology [KR]
Evaluation of the Training Effectiveness of the Colonoscopy Simulator

Haisheng Wu PhD (Cand)
Electrical & Computer Engineering, Univ of Western Ontario [CA]
A Haptics Based Simulator for Laparoscopic Pyeloplasty

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Exhibitor Reception

6:15 – 7:30 PM
Thursday, January 26

Thursday Morning, Session A

*Surgical Simulation: Development Tools – Design Issues*

7:55 Moderator’s Welcome

8:00 Alan Liu PhD
National Capital Area Medical Simulation Ctr, Uniformed Services Univ [US]
The Design and Implementation of a Pulmonary Artery Catheterization Simulator

8:15 Kevin N. Montgomery PhD
National Biocomputation Center, Stanford University
Project Hydra - A New Paradigm of Internet-Based Surgical Simulation

8:30 Johanna Pettersson PhD (Cand)
Biomedical Engineering, Univ Linköping [SE]
A Hip Surgery Simulator Based on Patient Specific Models Generated by Automatic Segmentation

8:45 John Hu PhD
Medical Robots & Systems, Energid Technologies [US]
Effectiveness of Haptic Feedback in Open Surgery Simulation and Training System

9:00 George Chami MD
Computer Science, Univ of Hull [UK]
Smart Tool for Force Measurements During Knee Arthroscopy: In Vivo Human Study

9:15 Julien Lenoir PhD
Simulation Group, CIMIT [US]
Interactive Physically-Based Simulation of Catheter and Guidewire

9:30 Oliver Tonet PhD
CRIM Lab, Scuola Superiore Sant’Anna [IT]
Tracking Endoscopic Instruments without Localizers: Image Analysis-Based Approach

9:45 Discussion

10:00 Break

10:15 Magnus G. Eriksson PhD (Cand)
Mechatronics Lab/Machine Design, Royal Inst of Technology [SE]
A Virtual Reality and Haptic Milling Surgery Simulator - Use High-Resolution Volume Data

10:30 Daniel Bachofen
Inst for Applied Information Technology, ZHW [CH]
Enhancing the Visual Realism of Hysteroscopy Simulation
10:45 Pablo José Figueras-Sola MSc  
Bioingeniería y Telemedicina, Polytechnic Univ of Madrid [ES]  
Virtual Reality Thread Simulation for Laparoscopic Suturing Training

11:00 Pablo Lamata MSc  
Bioingeniería y Telemedicina, Polytechnic Univ of Madrid [ES]  
Study of Laparoscopic Forces Perception for Defining Simulation Fidelity

11:15 Fernando Bello PhD  
Surgical Oncology & Technology, Imperial College London [UK]  
The Use of a GripForce System to Map Force Distribution Patterns of Laparoscopic Instruments

11:30 Anton J.B. Sanders MSc  
Kunst & van Leerdam Medical Technology bv [NL]  
Validation of Open-Surgery VR Trainer

11:45 Discussion

12:00 Break

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Thursday Morning, Session B

Information-Guided Therapies

7:55 Moderator’s Welcome

8:00 Kirby G. Vosburgh PhD  
CIMIT; Brigham & Women’s Hospital; Harvard Medical Sch [US]  
Tracking Instruments and Probes in the Body: Current and Future Opportunities

8:15 Mathias Hofer MD  
Innovation Ctr Computer Assisted Surgery (ICCAS), Univ of Leipzig [DE]  
Establishing Navigated Control in Head Surgery

8:30 Maryam E. Rettmann PhD  
Biomedical Imaging Resource, Mayo Clinic College of Medicine [US]  
An Integrated System for Real-Time Image Guided Cardiac Catheter Ablation

8:45 Michael N. D’Ambra MD  
Div of Cardiac Anesthesiology, Brigham & Women’s Hospital [US]  
Image Guided Cannulation of Central Veins Using Real-Time Machine-Vision Analysis and Live Image Fusion - A Precursor to Fully Automated Motion Control

9:00 Simon P. DiMaio PhD  
Surgical Planning Lab, Dept Radiology, Brigham & Women’s Hospital, Harvard Medical Sch [US]  
Needle Artifact Localization in 3T MR Images
9:15 Yoshito Otake MS
Inst for High Dimensional Medical Imaging, Jikei Univ Sch of Medicine [JP]
Evaluation of Soft Tissue-Generated Forces by Intraoperative Contact Pressure Measurement of the Hip Joint-Supportive Structures During Total Hip Arthroplasty

9:30 Kevin F. Fitzpatrick MD
Orthopaedics & Rehabilitation, Walter Reed Army Medical Ctr [US]
The Use of CT-based 3D Model Construction to Aid in Resection of Heterotopic Ossification after Traumatic Transfemoral Amputation: A Case Series

9:45 Emily M. Monahan MS
Mechanical Engineering, Carnegie Mellon Univ [US]

10:00 Break

Robotics

10:15 Henry C. Lin PhD (Cand)
Computer Science, Johns Hopkins Univ [US]
Vision-Assisted Automatic Detection and Segmentation of Robot-Assisted Surgical Motions

10:30 Mitchell J.H. Lum MSEE
Electrical Engineering, Univ of Washington [US]
Dynamic Analysis of a Spherical Mechanism for a Minimally Invasive Surgical (MIS) Robot - Design Concepts for Multiple Optimizations

10:45 Lars Matthaeus Dipl. Math. techn.
Inst for Robotics & Cognitive Systems, Univ of Luebeck [DE]
Planning and Analyzing Robotized TMS Using Virtual Reality

11:00 Christopher C. Enedah PhD (Cand)
Mechanical Engineering, Stanford Univ [US]
Robotic Perception of Mechanical Properties of the Human Skin: A Validation Study

11:15 Simon P. DiMaio PhD
Surgical Planning Lab, Dept Radiology, Brigham & Women’s Hospital, Harvard Medical Sch [US]
Robot-Assisted Needle Placement in Open-MRI: System Architecture, Integration and Validation

11:30 Mark E. Rentschler MS
Mechanical Engineering, Univ of Nebraska [US]
Mobile In Vivo Biopsy Robot

11:45 Discussion

12:00 Break

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Thursday Morning, Session C

Workshop/Panel:

**Integrating TATRC & DARPA Technologies**

Gerald Moses PhD
TATRC/USAMRMC

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Thursday Morning, Session D

Workshop:

*Virtual Patient: Research Roadmap for Integration of New Learning Technologies into Medical Simulation*

Brian Athey PhD
University of Michigan

Henry Kelly PhD
Federation of American Scientists

Gerry Higgins PhD
Federation of American Scientists; Laerdal Medical Corp.

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Thursday Afternoon, General Session

*Rehabilitation*

1:25 Moderator’s Welcome

1:30 He Huang PhD (Cand)
Harrington Dept Bioengineering, Arizona State Univ [US]
Design of Interactive Multimodal Biofeedback for Stroke Rehabilitation

1:45 Emma L. Patchick BSc
Sch of Psychological Sciences, Univ of Manchester [UK]
Can Immersive Virtual Reality Reduce Phantom Limb Pain?

2:00 Albert “Skip” Rizzo PhD
Inst for Creative Technologies & Sch of Gerontology, Univ of Southern California [US]
User-Centered Design Driven Development of a VR Therapy Application for Iraq War Combat-Related Post Traumatic Stress Disorder: From Training to Toy to Treatment
2:15 **Featured Speaker:** John Smart  
President, Acceleration Studies Foundation [US]  
[Presentation Title TBA]

2:40 **Presentation of the 12th Annual Satava Award**

3:00 Break

3:15 **General Session**, continued

*Intelligent Tutoring Technology: Accelerating Change in Medical Instruction*

3:15 – 5:15PM

Susann LuperFoy PhD

[Session presentation schedule TBA]

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**Thursday Evening**

**Poster Session – Group 2**

5:15 – 6:15 PM

**Display Technology**

Yoshifumi Kitamura PhD  
Human Interface Engineering Lab, Osaka Univ [JP]  
An Interactive Stereoscopic Display for Cooperative Work – Volume Visualization and Manipulation Environment with Multiple Users

Fuji Lai MS  
Medical Systems, Aptima, Inc. [US]  
Gestalt Operating Room Display Design for Perioperative Team Situation Awareness

Warren S. Sandberg MD PhD  
Anesthesia & Critical Care, Massachusetts General Hospital [US]  
Integration of All Operating Room Digital Data on a Single, Large-Format Display

Gunther Sudra Dipl Wi-Ing  
Inst of Computer Science & Engineering, Univ Karlsruhe (TH) [DE]  
Augmented Reality with Fiber Optics

**General Issues**

Bryan P. Bergeron MD  
HST Div, Harvard Medical Sch & MIT [US]  
Augmented Assessment as a Means to Augmented Reality
C. Donald Combs PhD  
NCCMMS/Planning & Program Dev, Eastern Virginia Medical Sch [US]  
Simulating the Domain of Medical Modeling and Simulation: The Medical Modeling and Simulation Database

Sarah D. Miyahira PhD  
Pacific Telehealth & Technology Hui, VA Pacific Islands Health Care System [US]  
A Meta-Analysis and Review of Virtual Reality in Training, Treatment, and Rehabilitation

Hisham M.F. Sherif MD  
[US]  
Is Practicing Medicine Virtually Impossible?

**Haptics**

Laurent Barbé PhD (Cand)  
AVR Team, LSIIT, UMR 7005 CNRS-ULP [FR]  
Online Robust Model Estimation During In Vivo Needle Insertions

Robert Riener Dr-Ing  
Automatic Control Lab, ETH Zurich [CH]  
Haptic Device for a Ventricular Shunt Insertion Simulator

**Information-Guided Therapies**

Raj Arangarasan PhD (Cand)  
Information Technology, Purdue Univ  
Lifecycle Planning and Management for IMRT Treatment

David A. Gilbert MD  
ASPS/ASAPS/FCACS, Eastern Virginia Medical Sch [US]  
3D Scanner: An Aid for Planning Breast Augmentation Surgery

Jiro Inoue MSc  
Sch of Computing, Queen’s Univ, Kingston, Ontario [CA]  
Fast Assessment of Acetabular Coverage Using Stereoscopic Volume Rendering

Timothy P. Kelliher  
Imaging Technologies, GE Global Research [US]  
Computer-Aided Forensics: Metal Object Detection

Uwe Kirschstein Dipl-Inf  
Computing Science,  
Div of Automation & Measurement Technologies, KISUM, Univ of Oldenburg [DE]  
Navigated Imaging for 3D Planning of Excisions and Register-Free Milling in Spine Surgery

Ching-Yao Lin PhD  
IT & Visualization Div, National Ctr for High-Performance Computing [TW]  
A VR Surgery Planning System for Craniosynostosis
Henry C. Lin PhD (Cand)  
Computer Science, Johns Hopkins Univ [US]  
Vision-Based Human-Machine Collaborative System for Ophthalmic Micro-Surgery

John S. Maier PhD MD  
Biomedical Application Science, ChemImage Corp [US]  
Raman Molecular Imaging in Application to Bladder Cancer Diagnosis

Ulrich Mueller  
Inst for Computational Medicine, Univ of Mannheim [DE]  
Fast Rigid Registration in Radiation Therapy

Daigo Tanaka PhD (Cand)  
Biomedical Engineering, Carnegie Mellon Univ [US]  
Computerized Planning of Prostate Cryosurgery

Guoyan Zheng PhD  
MEM Research Ctr, Univ of Bern [CH]  
Zero-Dose Fluoroscopy-Based Close Reduction and Osteosynthesis of Diaphyseal Fracture of Femur

**Networking**

Ruth A. Bush PhD  
Field Medical Technologies, Naval Health Research Ctr [US]  
Naval Medical Knowledge Management System: Providing In-Theater Visibility across the Entire Evacuation Chain

Martin J. Dudziak PhD  
R & D, TETRAD Technologies Group, Inc. [US]  
Flat, Flexible Postage-Stamp-Sized Sensor Modules and Networks for Invasive and Non-Invasive Monitoring During Surgical Procedures

Martin J. Dudziak PhD  
R & D, TETRAD Technologies Group, Inc. [US]  
A Mechanism for Detecting Trigger Points and Irreversibility Thresholds in Shock and Trauma for Critical Large-Population Catastrophic Events

Paul N. Kizakevich MS PE  
Digital Solutions, RTI International [US]  
Technologies for Measuring Human Exposure-Related Behavior

Damini Kumar PhD (Cand)  
Sch of Physiotherapy, Medicine, Univ College Dublin [IE]  
Wearable Kinematic and Physiological Biofeedback System for Movement Based Relaxation

Lori Maiolo  
Telemedicine, Driscoll Children’s Hospital [US]  
Telecommuting to Virtually Manage a Telemedicine Program in South Texas and Portions of Mexico Using Advanced Communications
Azhar Rafiq MD MBA  
Surgery, Virginia Commonwealth Univ [US]  
Development of Triage and Casualty Informatics Tool for Mass Casualty Incidents

Azhar Rafiq MD MBA  
Surgery, Virginia Commonwealth Univ [US]  
Coherent Event Capture in the Operating Room: A Tool for Patient Safety

Sarmad Sadeghi MD  
Sch of Health Information Sciences, Univ of Texas Health Science Ctr at Houston [US]  
Point-of-Care Decision Support System on Pocket PC Using Bayesian Inference

Warren S. Sandberg MD PhD  
Anesthesia & Critical Care, Massachusetts General Hospital [US]  
Automatic Detection and Annunciation of Geographic Location Errors in a Hospital

**Robotics**

Kenneth J. Fodero II BS  
Electrical Engineering, Univ of Washington [US]  
Control System Architecture for a Minimally Invasive Surgical Robot

Fuji Lai MS  
Medical Systems, Aptima, Inc. [US]  
Integrating Surgical Robots into the Next Medical Toolkit

**Visualization**

Fabio Bettio EE  
Visual Computing Group, CRS4 [IT]  
A Holographic Collaborative Medical Visualization System

WeeKee Chia BSE  
R & D, Volume Interactions Pte Ltd [SG]  
Contouring in 2D while Viewing Stereoscopic 3D Volumes

Chee-Kong Chui PhD  
Mechanical Engineering, National Univ of Singapore [SG]  
Flow Visualization for Interactive Simulation of Drugs Injection During Chemoembolization

Octavian Ciobanu PhD  
Medical Bioengineering, "Gr.T.Popu" Univ of Medicine & Pharmacy, Iasi [RO]  
The Use of a Computer Aided Design (CAD) Environment in 3D Reconstruction of Anatomic Surfaces

Celina Imielinska PhD  
Biomedical Informatics, Columbia Univ [US]  
Edmond A. Jonckheere PhD
Electrical Engineering, Univ of Southern California [US]
Visualization of a Stationary CPG-Revealing Spinal Wave

Dmitry V. Romanov
Central Child Polyclinic, M.I.A. [RU]
Virtual Medical Ultrasound Simulator

André Luiz Miranda da Rosa
Lab de Sistemas Integráveis, Dept Sistemas Eletrónicos, Univ de São Paulo [BR]
Direct Volumetric Rendering Based on Point Primitives in OpenGL

Gunther Sudra Dipl Wi-Ing
Inst of Computer Science & Engineering, Univ Karlsruhe (TH) [DE]
Marker Detection with Minolta Vi-900 Laser Scanner

Bharti H. Temkin PhD
Computer Science / Surgery, Texas Tech Univ [US]
Segmenting the Visible Human Female

Bharti H. Temkin PhD
Computer Science / Surgery, Texas Tech Univ [US]
Registration and Segmentation for the High Resolution Visible Human Male Images

John R. Winder PhD
Health & Rehabilitation Sciences Research Inst, Univ of Ulster [UK]
3D Surface Accuracy of CAD Generated Skull Defect Contour
Friday, January 27

Friday Morning, Session A

*Surgical Simulation: Didactics/Metrics – Skills Assessment*

7:55 Moderator’s Welcome

8:00 Adam Dubrowski PhD
Surgery, Univ of Toronto [CA]
Quantification of Process Measures in Laparoscopic Suturing

8:15 Bin Zheng MD PhD
Minimally Invasive Surgery, Legacy Health System [US]
Effects of Assembling Virtual Fixtures on a Virtual Navigation Task

8:30 Kent R. Van Sickle MD
Surgery, Univ of Texas Health Science Ctr at San Antonio [US]
The Pre-Trained Novice: Bringing Simulation-Based Training to Improve Learning in the Operating Room

8:45 Li Felländer-Tsai MD PhD
Clinical Science, Intervention & Technology, Karolinska Inst [SE]
Working Memory and Virtual Image Guided Surgical Simulation

9:00 Thomas R. Mackel MSEE
Biorobotics Lab, Electrical Engineering, Univ of Washington [US]
Data Mining of the E-pelvis Simulator Database - A Quest for a Generalized Algorithm Capable of Objectively Assessing Medical Skill

9:15 Jan-Maarten Luursema PhD (Cand)
Behavioral Sciences, Univ of Twente [NL]
Stereopsis and User-Interaction in Anatomical learning

9:30 Sayra M. Cristancho PhD (Cand)
Univ of British Columbia [CA]; Univ Pontificia Bolivariana, Bucaramanga [BO]
Assessing Cognitive & Motor Performance in Minimally Invasive Surgery (MIS) for Training & Tool Design

9:45 Discussion

10:00 Break

10:15 Linh N. Tran
Bioengineering & Mathematics, Univ of Washington [US]
Face, Content and Construct Validation Study of SimPraxis™: A Novel Prototype Cognitive Simulator for Standard Teaching and Assessment

10:30 Sheena J. Johnson MSc
Organisational Psychology, Univ of Liverpool NHS Trust [UK]
Metrics for an Interventional Radiology Curriculum: A Case for Standardisation?
10:45 Filippo Cavallo PhD (Cand)
CRIM Lab, Scuola Superiore Sant'Anna [IT]
Biomechanical Analysis of Surgeon’s Gesture for Evaluating Skills in Virtual Laparoscopy

11:00 Piet Kommers
Behavioral Sciences, Univ of Twente [NL]
Conceptual Navigation for Surgical Training in VR

11:15 James R. Korndorffer, Jr MD FACS
Surgery, Tulane Health Sciences Ctr [US]
Haptic Interfaces: Do They Matter?

11:30 Erich Schneider PhD
Neurology, Hospital of the Univ of Munich [DE]
Documentation and Teaching of Surgery with an Eye Movement Driven Head-Mounted Camera: See What the Surgeon Sees and Does

11:45 Discussion

12:00 Break

Friday Morning, Session B

Haptics

7:55 Moderator’s Welcome

8:00 Thomas Sangild Sørensen PhD
Ctr for Advanced Visualisation & Interaction, Univ of Aarhus [DK]
Haptic Feedback for the GPU-Based Surgical Simulator

8:15 Adrianus J. Houtsma PhD
Aircrew Protection Div, US Army Aeromedical Research Lab [US]
Can Augmented Virtual Force Feedback Facilitate Virtual Target Acquisition Tasks?

8:30 Zhuming Ai PhD
Biomedical & Health Information Sciences, Univ of Illinois at Chicago [US]
New Tools for Sculpting Cranial Implants in a Shared Haptic Augmented Reality Environment

8:45 Thomas Moix MS
IPR-LSRO, EPFL [CH]
A Haptic Device for Guide Wire in Interventional Radiology Procedures

9:00 Yi-Je Lim PhD (Cand)
Mechanical Engineering, Rensselaer Polytechnic Inst [US]
Measurement of the Mechanical Response of Intra-Abdominal Organs of Fresh Human Cadavers for Use in Surgical Simulation
Visualization

9:15 Gabor Fichtinger PhD
Computer Science, Mechanical Engineering & Radiology, Johns Hopkins Univ [US]
Bootstrapped Ultrasound Calibration

9:30 Toshikuni Saito
Graduate Sch of Science & Engineering, Waseda Univ [JP]
Estimation of Skeletal Movement of Human Locomotion from Body Surface Shapes Using Dynamic Spatial Video Camera (DSVC) and 4D Human Model

9:45 Yi Su PhD
Physiology & Biomedical Engineering, Mayo Clinic College of Medicine [US]
TRUS-Fluoroscopy Fusion for Intraoperative Prostate Brachytherapy Dosimetry

10:00 Break

10:15 Peter Kazanzides PhD
Computer Science, Johns Hopkins Univ [US]
System Architecture and Toolkits for Image-Guided Intervention Systems

10:30 Scott A. Gregory BS
Human Interface Technology Lab, Univ of Washington [US]
Patient-Specific Creation of a Global Static Model of the Bladder Urothelium Using AutoStitch: A Potential Enhanced Clinical Application for the Patient Record

10:45 Hakim Atmani PhD (Cand)
Le2i UMR CNRS 5158, ENSAM [FR]
Towards a Computer-Aided Surgery System for Shoulder Prosthesis Placement

11:00 Anand P. Santhanam MS
Sch of Computer Science, Univ of Central Florida [US]
Medical Simulation and Visualization of Pneumothorax Influenced 3D Lung Dynamics

11:15 John R. Winder PhD
Health & Rehabilitation Sciences Research Inst, Univ of Ulster [UK]
‘Virtual Unwrapping’ of a Mummified Hand

11:30 Eric Herbranson DDS
Stanford University [US]
Mummy Project

11:45 Discussion

12:00 Break

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Friday Morning, Session C

Workshop:

*Interoperability Standards for Medical Modeling and Simulation: Review of Progress and Future Plans*

Kenneth C. Curley MD  
TATRC; USUHS  

J. Harvey Magee  
TATRC

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Friday Afternoon, Session A

*Surgical Simulation: Validation – Future Issues*

1:25 Moderator’s Welcome

1:30 Peter Leskovsky MSc  
Computer Vision Lab, ETH Zurich [CH]  
A Web-Based Repository of Surgical Simulator Projects

1:45 Jonathan Marmurek  
Imaging Research Labs, Robarts Research Inst [CA]  
Image-Guided Laser Projection for Port Placement in Minimally Invasive Surgery

2:00 Pim Warntjes MSc  
Kunst & van Leerdam Medical Technology bv [NL]  
Open Surgery in VR: Inguinal Hernia Repair According to Lichtenstein

2:15 Eelco E. Kunst PhD  
Kunst & van Leerdam Medical Technology bv [NL]  
Towards a VR Trainer for EVAR Treatment

2:30 Timothy N. Judkins PhD (Cand)  
HPER Biomechanics Lab, Univ of Nebraska at Omaha [US]  
Real-Time Augmented Feedback Benefits Robotic Laparoscopic Training

2:45 Christopher M. Sewell MS  
Computer Science, Stanford Univ [US]  
Achieving Proper Exposure in Surgical Simulation

3:00 Break

3:15 M. Cenk Cavusoglu PhD  
Electrical Engineering & Computer Science, Case Western Reserve Univ [US]  
GiPSiNet: An Open Source/Open Architecture Network Middleware for Surgical Simulations
3:30 Wei Jin MS
Mechanical, Aerospace & Nuclear Engineering, Rensselaer Polytechnic Inst
Use of Surgical Videos for Realistic Simulation of Surgical Procedures

3:45 Matthias Harders PhD
Virtual Reality in Medicine Group, ETH Zurich [CH]
Highly-Realistic, Immersive Training Environment for Hysteroscopy

4:00 Todd H. Stokes BS
Biomedical Engineering, Georgia Tech [US]
Development of a 3D Stomach Model and Validation of Usability with Haptic Device

4:15 Cristian J. Luciano MS
Computer Science, Univ of Illinois at Chicago [US]
Second Generation Haptic Ventriculostomy Simulator Using the ImmersiveTouch™ System

4:30 Mark W. Scerbo PhD
Psychology, Old Dominion Univ [US]
A Simulation-Based Training System for Surgical Wound Debridement

4:45 William E. Lewandowski MS
[US]
A Return on Investment (ROI) Model to Measure and Evaluate Medical Simulation Using a Systematic, Results-Based Approach

5:00 Discussion

5:15 Adjourn

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Friday Afternoon, Session B

Workshop:

Developing Serious Games

Bryan Bergeron MD
Archetype Technologies

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Friday Afternoon, Session C

Workshop:

Integration of Biodefense with Public Health and Preventive Medicine: How the Functions and Technologies Can Collaborate and Support Each Other

Martin Dudziak PhD
TETRAD Technologies Group, Inc.