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

Medicine Meets Virtual Reality 14

Accelerating Change in Healthcare: Next Medical Toolkit

January 24 – 27, 2006
Hyatt Regency Long Beach
Long Beach, California

CONFERENCE AT A GLANCE

MONDAY, January 23

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

An adjunct activity organized by Stanford University Medical Media & Information Technologies (SUMMIT). Separate registration required via http://simworkshop.stanford.edu

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

Morning	Plenary: MMVR Opens; ICCAS
All Day	Posters Display (Group 1)
Late Morning	Exhibits Open
Afternoon	A: Education & Simulation
	B: Modeling
	C: Patient Safety
Evening	Poster Session (Group 1)
	Exhibitor Reception

THURSDAY, January 26

Morning	A: Surgical Simulation-Tools, Design
	B: Information Guided Therapies; Robotics
	C: Virtual Patient
	D: Integrating TATRC & DARPA Technologies *†
All Day	Posters Display (Group 2)
Late Morning	Exhibits Continue
Afternoon	Plenary: Rehabilitation; Satava Award; Intelligent Tutoring †
Late Afternoon	Exhibits Close
Evening	Poster Session (Group 2)

FRIDAY, January 27

Morning	A: Surgical Simulation-Didactics, Metrics, Assessment
	B: Haptics; Visualization
	C: Interoperability Standards for MM&S *
Afternoon	A: Surgical Simulation-Validation, Future
	B: Serious Games
	C: Biodefense

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

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 Panaiotis 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]
Surgical Multimedia Academic, Research and Training (S.M.A.R.T.) Tool: A Comparative
Analysis of Cognitive Efficiency for Two Multimedia Learning Interfaces

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

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

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

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

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 Engingeering, 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

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]
Computer-Aided Navigation for Arthroscopic Hip Surgery Using Encoder Linkages for Position Tracking

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 & Conitive 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

Thursday Morning, Session C

Workshop/Panel:

Integrating TATRC & DARPA Technologies

Gerald Moses PhD
TATRC/USAMRMC

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.

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]

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.Popa" 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]
Structure-Function Relationships in the Human Visual System Using DTI, fMRI and Visual Field Testing: Pre- and Post-Operative Assessments in Patients with Anterior Visual Pathway Compression

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

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

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

Friday Afternoon, Session B

Workshop:

Developing Serious Games

Bryan Bergeron MD
Archetype Technologies

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.