

Frederic (Rick) D. McKenzie

Professor

Modeling, Simulation, and Visualization Engineering Department
Joint Appointment, Electrical and Computer Engineering Department

Batten College of Engineering and Technology

Old Dominion University

1303 ECSB, 4700 Elkhorn Avenue, Norfolk, VA 23529

Phone : (757) 683-5590 Email : rdmckenz@odu.edu

Home Page: www.ece.odu.edu/~rdmckenz

EDUCATION

Ph.D. in Computer Engineering, University of Central Florida, May 1994,

Research area: Model-based diagnostic reasoning.

Masters of Science in Computer Engineering, University of Central Florida, May 1990.

Bachelor of Science in Engineering, University of Central Florida, May 1988.

EXPERIENCE

March 2011 – Present: *Promotion to Full Professor, Old Dominion University,*
Modeling, Simulation and Visualization Engineering (MSVE) Dept., Norfolk, VA.

March 2010 – Present: *Graduate Program Director, Old Dominion University,*
Modeling, Simulation and Visualization Engineering (MSVE) Dept., Norfolk, VA.

January 2010 – Present: *Adjunct Associate Professor, Eastern Virginia Medical School (EVMS),* School of Health Professions, Norfolk, VA.

Summer 2007 – Present: *Director of the Medical Imaging, Diagnosis, and Analysis (MIDA) Laboratory, Old Dominion University,* Department of Electrical and Computer Engineering (ECE) - Norfolk, VA.

August 2010 – Present: *Graduate Faculty Scholar, University of Central Florida (UCF),* School of Electrical Engineering and Computer Science, Orlando, FL.

April 2005 – March 2011: *Tenure and Promotion to Associate Professor, Old Dominion University,* Department of Electrical and Computer Engineering - Norfolk, VA.

August 1999 – Present: *Faculty Member, Old Dominion University,* MSVE Department and joint appointment in ECE Dept. - Norfolk, Virginia.

Oct. 1997 – August 1999: *Senior Scientist, Joint Simulation System (JSIMS) Project -* Science Applications International Corporation (SAIC) Orlando, FL.

- Team Lead for the JSIMS External Systems Interfaces (ESI) Working Integrated Product Team (WIPT).
- Develop and manage work products associated with an Object Oriented Software Development Process.

April 1995 - Oct. 1997: *Senior Scientist, Advanced Distributed Simulation (ADS)* Research Team - SAIC Orlando, FL.

- Project Director for the Modular Reconfigurable C4I Interface (MRCI) project.
- Project Director on the Command Decision Modeling (CDM) project.

- Active member of the Software Engineering Process Group (SEPG) at SAIC Orlando – a Software Engineering Institute (SEI) level 3 organization.

August 1996 - Dec. 1996: **Adjunct Faculty, University of Central Florida (UCF)**

Department of Electrical and Computer Engineering - Orlando, FL.

- Taught EEL 6878 - Modeling and Artificial Intelligence. Course covered Intelligent Tutoring Systems, knowledge-based reasoning, and Distributed Interactive Simulation.

July 1993 - April 1995: **Scientist, Integrated Development Team (IDT)** - Science Applications International Corporation (SAIC) Orlando, FL.

- Designed and developed the representation of tactical behaviors of Semi-Automated Forces (SAF) on the Close Combat Tactical Trainer (CCTT) project.
- Performed knowledge engineering activities involving US and Russian military experts and developed 50% of the knowledge base required to capture military platoon tactics for the first integrated version of the system.
- Used various OO design tools and methodologies to carry out the design and development (ObjectMaker, Rational Apex, Rumbaugh, Buhr).

Sept. 1990 - Oct. 1993: **Research & Teaching Assistant**, UCF Electrical & Computer Engineering Dept.

- Taught ECM4230 - C, C++, Data Structures & Taught EGN3211 - FORTRAN.
- Researched issues concerning Automated Knowledge Generation (AKG) from CAD data using NASA Kennedy Space Center's control & diagnostic system called Knowledge Automated Test Engineer (KATE). Translated over 90% of the KATE system from LISP to C++ on Sun/Unix workstation.
- Redesigned and optimized this system to diagnose a space station power distribution network patterned after the system on Space Station Freedom at NASA Marshall Space Flight Center (MSFC) in real-time.

SUMMARY STATEMENT

Dr. McKenzie is the Graduate Program Director in the new Modeling, Simulation and Visualization Engineering (MSVE) Dept. and a joint faculty member in the Department of Electrical and Computer Engineering (ECE) at Old Dominion University. In addition, he is the director of the Medical Imaging, Diagnosis, and Analysis (MIDA) Laboratory, Adjunct Associate Professor of Eastern Virginia Medical School (EVMS) in the School of Health Professions, and Graduate Faculty Scholar at University of Central Florida (UCF) in the School of Electrical Engineering and Computer Science. Before coming to Old Dominion University, Dr. McKenzie spent 6 years in the simulation industry as a senior scientist.

Dr. McKenzie's research has been in medical modeling and simulation, human behavior representation, and simulation architectures often focusing on aspects of scientific visualization and virtual reality. For the past 10 years he has fostered collaborative ongoing efforts with 1) Drs. Nuss, Kelly, and Obermeyer (Children's Hospital of the King's Daughters) in the determining the cause of pectus excavatum (PE) and developing tools to aid in the planning and conduct of the minimally invasive Nuss procedure for treating PE; with 2) Thomas Hubbard, MD (Eastern Virginia Medical School) instrumenting standardized patients to improve the quality of professional skills training for medical students where Dr. McKenzie coined the term augmented standardized patient (ASP); and with 3) Drs. Paul Schellhammer, John Semmes and the EVMS proteomics center which has resulted in successful preliminary results combining molecular imaging (MALDI) with optical imaging for supporting prostate cancer biomarker identification.

GRANTS AWARDED

- Collaborative Research: Engineering Laboratory Instruction in Immersive Virtual Environments (ENLIIVEN), NSF, PI Sushil Chaturvedi, Co-PI Rick McKenzie. \$198,536. 17% summer time. Jan. 2011 - Dec. 2012.
- Nuss Procedure Simulator Planner, CHKD - Children's Surgical Specialty Group (CSSG), PI Rick McKenzie, \$50,000 Fall 2010 - Summer 2012.
- Communication Outcomes for Naming Treatments in Aphasia: American Recovery and Reinvestment Act (ARRA) Supplemental Grant, National Institutes of Health (NIH), PI Stacie Raymer, Co-PI Rick McKenzie, \$34,587, Fall 2009 to Fall 2010.
- Cognitive Modeling for Closed-Loop Task Mitigation, NASA SBIR, PI Jiang Li, Co-PI Rick McKenzie, 2 months Summer, Spring 2010 - Fall 2011.
- Cyberknife Radiation Modeling: Effects of Reduced Parameter Corrections on Healthy Tissue Irradiation, EVMS Dept. of Radiology, PI Rick McKenzie, \$9,792, Fall 2009 to Spring 2010.
- Modeling and Simulation Solutions for Standardized Patients: Selection, Refinement, and Augmentation, EVMS, PI Mark Scerbo, Co-PI Rick McKenzie, support for 2 graduate students, Fall 2009 - October 2010.
- Simulation and Visualization Enhanced Engineering Education, NSF, PI Sushil Chaturvedi, Co-PI Rick McKenzie. \$999,741. Fall 2005 - Summer 2009.

- Quality Dental Implant Site Preparation and Placement Using 3D Imaging and Robotics: Initial Phase, PI Jiang Li, Co-PI Rick McKenzie Fall 2008 to Summer 2009. \$41,397.
- Health iManage (HiM): Incentivized Type 2 Diabetes Management Using I-Phone Technology, ODU Office of Research, PI Rick McKenzie, Spring 2009 to Summer 2009, \$27,000.
- Hybrid Texture Imaging and Molecular Biomarker Classification of Prostate Cancer Tumor Cells, ODU Office of Research, PI Jiang Li, Co-PI Rick McKenzie, Spring 2009 to Summer 2009, \$79,997.00.
- Physics Based Process Simulation and Models with Stochastic Variability and Visualization, Northrop Grumman, PI Ravi Joshi, Co-PI Rick McKenzie, Fall 2008 to Spring 2009, \$115,976.
- Co-PI - National Center for Collaboration in Medical Modeling and Simulation (NCCMMS), (Fall 2006 – Fall 2009), \$1,399,943, NAVAIR Orlando, 4 person months per year.
- Crowd Behavior Modeling in Massively Multi-Player On-line Games, RDE-COM, PI Rick McKenzie. \$48,000. Summer 2007 – Fall 2007.
- PI - Agent-Based Modeling Short Course Development and Conduct, (Fall 2007), \$60,000, NASA Langley.
- PI - Discrete Event Simulation Asynchronous Course Development, (Fall 2007 – Spring 2008), \$32,000. Old Dominion University Office of Research.
- Crowd Behavior Modeling (3rd Award), DMSO, AFRL, JFCOM, PI Rick McKenzie. \$468,000. Summer 2005 – Fall 2006.
- The Augmented Standardized Patient: Using Augmented Reality for Assessment, Stemmler Medical Education Research Fund. PI Rick McKenzie, \$70,000. Summer 2005 – Fall 2006.
- Human Performance Modeling using Circadian Rhythms, USAMRMC, PI Rick McKenzie, \$100,000, Fall 2004 – Summer 2005.
- Quantifying Prostate Surgery Success (3rd Award), EVMS, PI Rick McKenzie, \$10,000. Fall 2004.
- The National Center for Collaboration in Medical Modeling and Simulation (NCCMMS), NAVAIR Orlando, PI Bowen Loftin, Approx. 25% release time for Rick McKenzie, Spring 2004 – Fall 2005.
- Crowd Behavior Modeling (2nd Award), DMSO, PI Rick McKenzie, PI Mikel Petty. Approximately \$490,000. Fall 2004 – Summer 2005.
- NSF Planning Grant: Simulation and Visualization Enhanced Engineering Education, NSF, PI Sushil Chaturvedi, Co-PI Rick McKenzie. \$99,895. Fall 2003.
- Quantifying Prostate Surgery Success (2nd Award), EVMS, PI Rick McKenzie, \$18,816. Spring 2003 to Spring 2004.
- Composable, Reconfigurable, Environment for Acquisition, Training and Experimentation (CREATE), DMSO, Co-PI Rick McKenzie. \$42,500 (Project Total: \$298,925, Fall 2002 to Spring 2004.
- Virtual Environments for Training, ONR, PI R. Bowen Loftin, Co-PIs Rick McKenzie and Mark Scerbo. \$1,556,000. Oct. 2000 – September 2002.

- Quantifying Prostate Surgery Success, EVMS, PI Rick McKenzie, \$31,954. Spring and Summer 2002.
- Formal Methods for Simulation Architectures, STRICOM, PI Mikel Petty, Co-PI Rick McKenzie. \$45,000. Fall 2001-Spring 2002.
- Joint Battlespace Environment (JBE) IITSEC Integration, JFCOM J7, PI Mark Phillips, Co-PI Rick McKenzie. \$42,000. Fall 2001.
- Joint Futures Predicting Intentions, JFCOM J9, PI Mikel Petty, Co-PIs Rick McKenzie, Jeff McNeil, and Mark Phillips. \$30,000. Spring 2001.
- Personality-based Human Behavior Modeling, VMASC IR&D, PI Rick McKenzie. \$25,000. Summer 2000.
- 2D/3D Navigation Display sponsored by WR Systems, PI Dave Dryer, Co-PI Rick McKenzie. \$30,000. Spring 2000.

STATUS OF OTHER RECENT GRANTS

- **Recommended for Funding:** NSF MRI: Acquisition of a 3D Metal Object Printer for Innovative Manufacturing, Biomedical and Implant Applications, NSF Major Research Instrumentation (MRI) Grant, PI Rick McKenzie, \$844,658, Fall 2010 – Fall 2013. – Although this was recommended for funding by reviewers, it was not funded due to funding constraints. This proposal was resubmitted January 2011.

PATENTS

- Several patents are close to be filed including: Type 2 diabetes management, Robotic Dental Implantation, and Cyberknife Radiation Modeling.
- Surgical Tool for Pectus Bar Extraction. Utility. Jan, 22, 2010. Ref. #US 12/692,232.
- Subject Actuated System and Method for Simulating Normal and Abnormal Medical Conditions. Utility. Oct. 31, 2006. Ref. #113019.224US .
- System, method, and medium for simulating normal and abnormal medical conditions. Provisional. Oct. 25, 2004. Utility. Ref. #60/621084. **Now commercial product:** <http://www.cardionics.com/stanPattheStandardizedPatientAuscultationSystem.htm>
- Surgical simulator to support wound debridement. Provisional. July 2005. Prov. #60/706414.

CONSULTING ACTIVITIES

- HLA Instruction, NASA Langley, 2005.
- Advanced Distributed Simulation, Science Applications Int'l Corporation (SAIC), 1999 – 2000.

HONORS, AWARDS AND PRIZES

- IEEE Senior Member
- ODU ECE Department 2007 Researcher of the Year.
- Modeling & Simulation Professional Certification Commission (M&SPCC) Certified Modeling and Simulation Professional (CMSP). December 2002.
- HIPAA Research Training Certificate
- NIH Protection of Human Research Subjects Certificate
- Global Command and Control System (GCCS) Operator Training. 1997.
- ModSAF User / Developer Training. 1996.
- DoD Secret Clearance. 1996.
- Engineering Intern (EI) certificate. 1987.

COURSES TAUGHT

ENGN 110/111 - Explore Engineering and Technology

- Notes Handout on Discrete Event Simulation

ECE 462/562 - Medical Imaging and Simulation (Co-instructed Spring 2008/2009)

- Required Text: Atam Dhawan, *Medical Image Analysis*, Wiley-IEEE Press, 2003. ISBN: 0471451312

ECE 405/505 - Introduction to Discrete Event Simulation

- Required Text: A. M. Law and W. D. Kelton, *Simulation Modeling and Analysis*, Third Edition, McGraw-Hill, New York, NY, 2000. ISBN: 0-07-059292-6
- Required Text: W. D. Kelton, R. P. Sadowski, and D. T. Sturrock: *Simulation with Arena*, Third Edition, WCB/McGraw-Hill, Boston, MA, 2002. Version with software enclosed. ISBN: 0-07-291981-7.

MSIM 601 - Introduction to Modeling & Simulation (DES section)

- Notes Handout

ECE 605 - Engineering Systems Modeling

- Required Text: Paul A. Fishwick, *Simulation Model Design and Execution: Building Digital Worlds*, Prentice Hall, 1995. ISBN-0-13-098609-7.
- Required Text: UML Distilled: A Brief Guide to the Standard Object Modeling Language by Martin Fowler, Kendall Scott. Addison-Wesley Pub Co; 2nd edition (August 25, 1999) ISBN: 020165783X.
- Concepts Covered: UML, Markov models, Bayesian networks, Petri nets, system dynamics, Bond graphs, cellular automata, and distributed simulation.

MSIM 710/810 - Advanced Discrete Event Simulation (Co-taught)

- Required Text: W. D. Kelton, R. P. Sadowski, and D. T. Sturrock: *Simulation with Arena*, Third Edition, WCB/McGraw-Hill, Boston, MA, 2002. Version with software enclosed. ISBN: 0-07-291981-7.

Others - Previously taught

- Intelligent tutoring systems, knowledge-based reasoning, C, C++, data structures, and Fortran

GRADUATE DEGREES SUPERVISED

- GyuTae Kim, Ph.D. ECE, "Statistical Optimizations of Muscle Action Potentials Based on Modeling and Analysis of Ion Channel Dynamics," Old Dominion University (ODU), August 2011
- Bo Sun, Ph.D. MSIM, "Real-Time Ultrasound Simulation for Medical Training and Standardized Patient Assessment," Old Dominion University (ODU), May 2008
- Rania Hussein, Ph.D. ECE, "An Adaptive Algorithm to Identify Ambiguous Prostate Capsule Boundary Lines for 3D Reconstruction and Quantitation," Old Dominion University (ODU), August 2006
- Sudha Potineni, "Cyberknife Radiation Modeling: Effects of Reduced Translational and Rotational Constraints on Healthy Tissue Irradiation," M.S. Thesis, ECE, Old Dominion University (ODU), August 2011.
- Sujith Surendran, "EKG Tracking for Augmented Standardized Patient Virtual Pathology Stethoscope Heart Auscultation," M.S. Thesis, ECE, Old Dominion University (ODU), May 2010
- Annette Castilano, "Augmented Skin Pathology for Simulation and Training" M.S. Thesis, ECE, Old Dominion University (ODU), December 2009
- Natalie Chuang, "Adjacent Slice Prostate Cancer Predication to Inform MALDI Imaging Biomarker Analyses," M.S. Thesis, ECE, ODU, August 2009.
- Swetha Purmandla, "Immersive Active Learning for Virtual Laboratory Experiments," M.S. Thesis, ECE, Old Dominion University (ODU), August 2008.
- ZhenZhen Yan, "An Approach to Identifying the Biomechanical Differences Between Intercostal Cartilage in Subjects with Pectus Excavatum and Normals In Vivo: Reconstruction and CT Registration," M.S. Thesis, ECE, Old Dominion University (ODU), May 2008.
- Taryn Cuper, "Investigation of a Validation Technique for the Registration of 3D Points Directly to Subjects with Pectus Excavatum," M.S. Thesis, MSIM, Old Dominion University (ODU), May 2008.
- Jason Loveland, "Integrating Game Technology and Discrete Event Simulation to Analyze Mass Casualty Scenarios," M.S. Thesis, MSIM, Old Dominion University (ODU), May 2008.
- Scott Guirlinger, "Simulation to Augment Standardized Patients in Obstetric Ultrasound Training," M.S. Thesis, MSIM, Old Dominion University (ODU), December 2007.
- Gurkan Haznedaroglu, "What Should be in Human Behavior Representation Federation Object Model for High Level Architecture," M.S. Thesis, ECE, Old Dominion University (ODU), May 2007.
- Reynel Castelino, "Augmented Reality for Auscultation in Standardized Patients," M.S. Thesis, ECE, Old Dominion University (ODU), December 2005.
- Sai Boyepadu, "Support for a Delivery Train Based Material Handling Mechanism," M.S. Thesis, ECE, Old Dominion University (ODU), August 2005.
- Fatemah Al-Douli, "Applying A Simulation-Based Real-time Decision Making Method to Mass Casualty Scenarios in Hospital Emergency Departments," M.S. Thesis, Old Dominion University (ODU), May 2005.

- Roger Wuerfel, "Distributed Simulation Data Flow Visualization Environment," M.E. Project, MSIM, ODU, May 2005.
- Sylva Girtelschmid, "Fine-tuning of mass-spring model properties for simulating realistic soft body deformation," M.S. Thesis, ODU, May 2005.
- Joseph Stoner, "Simulation of Cutting Human Tissue Using the Finite Element Method," M.E. Project, MSIM, ODU, May 2004.
- Adnan Jafri, "Development of an Efficient Interactive Federate to Manage and Monitor an HLA Federation Exercise Using the Management Object Model," M.S. Thesis, ODU, May 2003.
- Taimur K. Khan, "Approaching High Fidelity Human Tracking and Representation in Interactive Virtual Environments," M.S. Thesis, ODU, December 2002.
- Satyam Das, M.S. Project, Old Dominion University, May 2002.

CURRENT GRADUATE STUDENTS

Austin Stoudenmire, PhD, expected graduation, December 2011
 Xiaoyan Sun, PhD, expected graduation, December 2011
 Dennis Bergin, PhD, expected graduation, December 2011
 Krzysztof Rechowicz, PhD, expected graduation, May 2012
 Hector Garcia, PhD, expected graduation, May 2012
 Natalie Chuang, PhD, expected graduation, August 2012
 Salim Chemlal, PhD, expected graduation, August 2012
 Kasi Vegesana, PhD, expected graduation, May 2013
 Nahom Kidane, MS, expected graduation, August 2012
 Shuo (Andy) Ren, MS, expected graduation, December 2012

UNIVERSITY SERVICE

- College Tenure and Promotion Committee – MSVE Department representative
- ODU Human Subjects Review Committee and Institutional Review Board (IRB) Engineering Member 2007-Present
- Faculty Senate Committee G - Faculty Status and Remuneration 2008-Present
- BCET Suspension & Appeals Committee – Committee Member Fall 1999 to Present
- ODU Human Subjects Review Committee and Institutional Review Board (IRB) Engineering Alternate 2006-2007
- Electrical and Computer Engineering Department Graduate Committee 2008-2010
- BCET Suspension & Appeals Committee – Committee Chairman 2003-2006
- MSIM Graduate Program Committee 2005/2006
- Search Committees
 - MSVE Assistant Professor Fall 2010, VMASC Chief Scientist Summer 2010
 - VMASC Director Fall 2005, Spring 2010, ECE Department Chair Fall 2005
 - ECE Visualization Faculty Spring 2006, ME Mechatronics Faculty Spring 2006
 - ENMA Faculty Spring 2001 & 2006, ECE Faculty Spring 2001
- ECE Graduate Seminar invited talk Spring 2001, 2009

PROFESSIONAL SERVICE

- IEEE Senior Member 2005, Member since 1987.
- Association of Computing Machinery (ACM) Special Interest Group on Simulation (SIGSIM) -- Vice Chairman 2003 – Summer 2005.
- Association of Computing Machinery (ACM) Special Interest Group on Simulation (SIGSIM) Secretary/Treasurer December 1999 to 2003.
- General Chair, The 2012 Modeling, Simulation, and Visualization (MS&V) Student Capstone Conference.
- Technical Program Committee Member
 - AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference 2006
 - IEEE/ACIS International Conference on Computer and Information Science
- Expert Panelist on Human Behavior Representation, Behavior Representation in Modeling and Simulation (BRIMS), Universal City CA, May 2005.
- Expert Panelist on Healthcare Simulation Triangle, 10th Annual International Meeting on Simulation in Healthcare (IMSH 2010), Phoenix, Arizona, January 2010.
- Conference Special Session Organizer
 - Invited Session "Pediatric Treatment Modeling and Simulation" at the 4th International Conference on BioMedical Engineering and Informatics (BMEI 2011) October 2011.
 - Special Session in Biological Applications of Optimization in the AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference, September 2006.
- Conference Tutorial
 - Crowd Modeling for M&S, Simulation Interoperability Workshop Fall 2006.
- Session Chair, Computer Aided Design (CAD) Conference, BioEngineering
- Proposal Reviewer, National Institutes of Health (NIH) Challenge Grants 2009.
- Proposal Reviewer, The Prostate Cancer Charity, Hammersmith, London, UK
- Reviewer, IEEE Transactions on Biomedical Engineering
- Reviewer, IEEE Transactions on Medical Imaging
- Reviewer, IEEE Virtual Reality conference
- Reviewer, IEEE Computing in Science & Engineering (CiSE) magazine
- Reviewer, SIMULATION: Transactions of the Society for Modeling and Simulation International
- Reviewer, Information Sciences Journal, Elsevier
- Reviewer, SISO Behavior Representation in Modeling and Simulation (BRIMS)

COMMUNITY SERVICE

- Design judge for senior design, Norfolk State University Engineering Dept., 2009
- Virginia Beach Neighborhood Youth Soccer League U4 Coach, Fall 2005
- Design judge for School of the Future high school design competition, Spring 2000
- Engineering exposure after school lecture, Greenwich Middle School, Spring 2000.

PUBLICATIONS

Book Chapters:

Jiang Li, Natalie Chuang, Vamsi Mantena, Feng Li and Frederic D. McKenzie, "Application of Machine Learning Techniques to Biomarker Identification for Prostate Cancer," *Computational Techniques and Algorithms for Image Processing*. S. Ramakrishnan & Ibrahim M. M. El Emary, Editors. Lambert Academic Publishing (LAP), Germany, 2010. ISBN: 978-3-8433-5802-6.

Frederic D. McKenzie, "Systems Modeling: Analysis and Operations Research," *Modeling and Simulation Fundamentals: Theoretical Underpinnings and Practical Domains*. J. Sokolowski and C. Banks, Editors. John Wiley & Sons, Inc, 2010. ISBN: 978-0-470-48674-0, pp. 147-180.

R. B. Loftin, M. D. Petty, R. C. Gaskins , and F. D. McKenzie. "Modeling Crowd Behavior for Military Simulation Applications." *Organizational Simulation*, W. B. Rouse and K. R. Boff, Eds. John Wiley & Sons, Inc, 2005. ISBN: 0471681636, pp 471-536.

Book Articles:

Sun, Bo, Frederic D. McKenzie, Hector M. Garcia, Thomas Hubbard, John Ullian, Gayle Gliva, "Medical Student Evaluation using Augmented Standardized Patients: New Development and Results," *Medicine Meets Virtual Reality 15 - in vivo, in vitro, in silico: Designing the Next in Medicine*, Edited by James D. Westwood, Randy S. Haluck, Helene M. Hoffman, Greg T. Mogel, Roger Phillips, Richard A. Robb, Kirby G. Vosburgh. Volume 125, pp. 454 - 456, IOS Press, 2007, ISBN 978-1-58603-713-0.

McKenzie, Frederic D., Thomas Hubbard, John Ullian, Hector M. Garcia, Reynel Castelino, Gayle Gliva. "Medical Student Evaluation using Augmented Standardized Patients: Preliminary Results." In *Medicine Meets Virtual Reality 14 - Accelerating Change in Healthcare: Next Medical Toolkit*. Edited by James D. Westwood, Randy S. Haluck, Helene M. Hoffman, Greg T. Mogel, Roger Phillips, Richard A. Robb, Kirby G. Vosburgh, Volume 119, pp. 379 - 384, IOS Press, 2006, ISBN 978-1-58603-583-9.

H. Myler, A. Gonzalez, M. Towhidnejad, F. McKenzie, R. Kladke. "Automated knowledge generation from incomplete CAD data: Research results." *Advances in Artificial Intelligence*, Volume II. Mark Fishman, Editor. JAI Press, 1991.

A. Gonzalez, H. Myler, M. Towhidnejad, F. McKenzie, R. Kladke, R. Laureano. "Automated extraction of knowledge from CAD databases." *Knowledge Discovery in Databases*. W. Frawley and G. Piatetsky-Shapiro, Editors. AAAI Press, 1991.

Journal Papers:

Yongki Yoon, Xiaoyan Sun, Jen-Kuang Huang, Gene Hou, Krzysztof Rechowicz, Frederic D. McKenzie. "Designing Natural-Tooth-Shaped Dental Implants based on Soft-Kill Option Optimization." *Computer-Aided Design and Applications*, In Press April 2012.

Hoang-Anh T Nguyen, John Musson, Feng Li, Wei Wang, Guangfan Zhang, Roger Xu, Carl Richey, Tom Schnell, Frederic D McKenzie, Jiang Li. "EOG artifact removal using a wavelet neural network," *Neurocomputing*, In Press April 2012.

Krzysztof J. Rechowicz, Frederic D. McKenzie, Sebastian Y. Bawab and Robert Obermeyer. "Evaluation of Fatigue for a Pectus Bar Removal Surgical Tool Design for a Safe Clinical Practice Use Setting." *Computerg-Aided Design and Applications*, In Press March 2012.

Shao-Hui Chuang, Jiang Li, Xiaoyan Sun, Ayyappa Vadlamudi, Bo Sun, Lisa Cazares, Julius Nyalwidhe, Dean Troyer, John Semmes, Frederic D. McKenzie. "Prostate Cancer Region Prediction by Fusing Results from MALDI Spectra Processing and Texture Analysis." *Simulation: Transactions of the Society for Modeling and Simulation International*, February 2012 In Press.

Krzysztof J. Rechowicz, Frederic D. McKenzie, Sebastian Y. Bawab and Robert Obermeyer. "Application of CAD Analysis to Update the Design for a Pectus Excavatum Bar Extraction Tool." *Computer-Aided Design and Applications*, Volume 9, No. 2, 2012, pp 227-234.

Xiaoyan Sun, Yongki Yoon, Jiang Li, Frederic D. McKenzie. "An Integrated Computer-Aided Robotic System for Dental Implantation." *The MIDAS Journal - Systems and Architectures for Computer Assisted Interventions 2011. Selected papers from the 14th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI 2011) Workshop on Systems and Architectures for Computer Assisted Interventions 2011*, On-line Journal publication date October 1, 2011, pp. 1-8.

Roland R. Mielke, James F. Leathrum, Jr., and Frederic D. McKenzie. "A Model for University-Level Education in Modeling and Simulation" *Modeling and Simulation (M&S) Journal*, Volume 6, No. 3, 2011, pp. 14-23.

Loc Tran, Deb Banerjee, Xiaoyan Sun, Jihong Wang, Ashok J. Kumar, David Vinning, Frederic D. McKenzie, Yaohang Li and Jiang Li. "A Large-Scale Manifold Learning Approach for Brain Tumor Progression Prediction." *Machine Learning in Medical Imaging, Lecture Notes in Computer Science*, Volume 7009, 2011, pp. 265-272.

Xiaoyan Sun, Frederic D. McKenzie, Sebastian Bawab, Jiang Li, Yongki Yoon, Jen-K Huang. "Automated Dental Implantation Using Image-guided Robotics - Registration Results." *International Journal of Computer Assisted Radiology and Surgery*, Volume 6, 2011, pp. 627-634.

Bo Sun and Frederic D. McKenzie. "Real-Time Sonography Simulation for Medical Training." *International Journal of Education and Information Technologies*. Issue 3, Volume 5, 2011, pp. 328-335.

Li, J, R. McKenzie, L. Cazares, R. Drake, J. Semmens. "An efficient algorithm for biomarker identification." *CANCER BIOMARKERS*. Volume 4, No. 3, 2008, pp. 149-150. ISSN: 1574-0153.

McKenzie, F.D., M.D. Petty, P.A. Kruszewski, R.C. Gaskins, Q.H. Nguyen, J. Seevinck, and E.W. Weisel. "Integrating Crowd-Behavior Modeling into Military Simulation using Game Technology." *Simulation & Gaming Journal: An Interdisciplinary Journal of Theory, Practice, and Research*. Volume 39, No. 1, March 2008, pp. 10-38.

Moya L., F. McKenzie, Q. Nguyen. "Visualization and Rule Validation in Human-Behavior Representation." *Simulation & Gaming Journal: An Interdisciplinary Journal of Theory, Practice, and Research*. Volume 39, No. 1, March 2008, pp. 101-117.

Mathews, Mary, Min Song, Sachin Shetty and Frederic McKenzie. "An Anomaly-based Approach to Detect Compromised Nodes in Wireless Sensor Networks." *International Journal of Computer and Information Science*. Volume 9, No. 1, January 2008, pp. 11-20.

Hussein, Rania, Frederic D. McKenzie. "Identifying Ambiguous Prostate Gland Contours from Histology Using Capsule Shape Information and Least Squares Curve Fitting." *International Journal of Computer Assisted Radiology and Surgery*, Volume 2, Numbers 3-4, December 2007, pp. 143-150.

Diaz JI, Corica A, McKenzie R, Schellhammer PF. "Comparative study of surgical efficacy in open and laparoscopic prostatectomy: virtual reconstruction of the prostate and quantification of periprostatic tissue." *Actas Urology Espanol*, Vol. 31, No.9, 2007, pp. 1045-1055. ISSN 0210-4806.

Schellhammer, Paul F., Jose I. Diaz, Michael D. Fabrizio, John W. Davis, Robert W. Given, Brian Main, N. Rao Chaganty, Rania Hussein, and Rick McKenzie. "Computer Modeling Technology to Assess Extra-Capsular Tissue Coverage of Whole Mount Sections after Retropubic and Laparoscopic Radical Prostatectomy." *Journal of Urology*, Vol. 178, October 2007. pp. 1301-1305. Featured on the front cover of journal.

Hans P.A. Van Dongen, Christopher G. Mott, Jen-Kuang Huang, Daniel J. Mollicone, Frederic D. McKenzie, David F. Dinges, "Optimization of Biomathematical Model Predictions for Cognitive Performance Impairment in Individuals: Accounting for Unknown Traits and Uncertain States in Homeostatic and Circadian Processes." *SLEEP Journal*. Vol. 30 No. 9, September 2007. pp. 1129-1143.

Hans P.A. Van Dongen, Christopher G. Mott, Jen-Kuang Huang, Daniel J. Mollicone, Frederic D. McKenzie, David F. Dinges, "Confidence intervals for individualized performance models." *SLEEP Journal*. Vol. 30 No. 9, September 2007. pp. 1083-1083.

Sun, Bo, Frederic D. McKenzie, Hector M. Garcia, Thomas Hubbard, John Ullian, Gayle Gliva. "Medical Student Evaluation Using Augmented Standardized Patients." *The Journal of the Society for Simulation in Healthcare (SSH)*. Special issue of Simulation in Healthcare selected papers from the Computer Simulation in Medicine (CompMed) symposium, co-supported by the Society for Simulation in Healthcare (SSH). Vol.2 No. 2, Summer 2007, p. 143.

Sun, Bo and Frederic D. McKenzie. "Prostate Cancer Tool Kit and Data Repository." *The Journal of the Society for Simulation in Healthcare (SSH)*. Special issue of Simulation in Healthcare selected papers from the Computer Simulation in Medicine (CompMed) symposium, co-supported by the Society for Simulation in Healthcare (SSH). Vol.2 No. 2, Summer 2007, p.156.

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