

Curriculum Vitae

Matthew VanSanten Kozlowski, Ph.D.

June 2009

Director of Robotics Systems
Orthocare Innovations
700 12th Street, NW, Suite 700
Washington, D.C. 20005

SUMMARY

Current work in advanced upper extremity prosthetics and robotics – lead development and test of “Prototype 1” full shoulder disarticulation prosthetic limb system under DARPA’s Revolutionizing Prosthetics Program. Lead all patient test and integration both in USA and abroad (Austria). Tested on total of 5 patients. Currently leading the advanced body attachment strategies for the next generation of neurally integrated upper extremity prosthetics as well as the development of the 3 degree of freedom wrist for the final limb as the DARPA deliverable

Current work in advanced explosive ordnance disposal robots for NAEODTECHDIV Project Manager – working on advanced dexterity for future ground EOD robot systems as well as leading the common architecture and over all systems engineering effort for the Advanced EOD Robot System (AEODRS)

Previous work in systems engineered approach for selection and deployment of chemical and biological sensors used to prevent the ingress of WMD at our nation’s borders. Extensive background in noise and vibration control. Earned Ph.D. in Sept. 2003 for research on positive real vibration control methods using the adaptive piezoelectric sensoriactuator. Design and analysis experience in experimental setup and modeling.

EDUCATION

Ph.D. Mechanical Engineering, Duke University – Dissertation “Positive Real Vibration Control Using the Adaptive Piezoelectric Sensoriactuator” (2003)

B.S. Mechanical Engineering, University of Virginia – Thesis “A Structural Analysis Technique for Preloaded Threaded Fasteners” (1999)

College Preparatory – St. Joseph’s Preparatory School, Philadelphia, PA (1995)

WORK EXPERIENCE

2005 – 2009: JHU/APL – Biomedicine Group, National Security Technology Department

Lead Engineer – Prototype 1 Shoulder Disarticulation Prosthetic Limb System – lead a team of 20 engineers across 5 organizations to develop an advanced prosthetic limb prototype under the DARPA Revolutionizing Prosthetics Program. Responsible for all aspects of schedule and development including final system integration and test. Led patient test work at the Rehabilitation Institute of Chicago in 2007.

Project Engineer- DARPA Revolutionizing Prosthetics Program – responsible for document generation and document review as well as all levels of program level development for the program.

Subsystem Development Team Lead – Socket Team – led the development of advanced socket designs for 3 level of amputations (shoulder disarticulation, transhumeral, transradial). Led a team of 15 engineers and

clinical prosthetists across 5 organizations to develop, test and demonstrate 3 novel socket designs to support the advanced limb system as developed through the DARPA Revolutionizing Prosthetics Program.

Project Manager – Led a team of 4 engineers in the development of common systems architecture for the next generation of Explosive Ordnance Disposal Robot Systems. Responsible for all aspects of technical development, schedule, and financial oversight for a multi-team development effort through the Naval Explosive Ordnance Disposal Technology Division (NAVEODTECHDIV) for the system architecture and system integration of the Advanced Explosive Ordnance Disposal Robot System (AEODRS)

Principal Investigator – Human Integrated Robotic Systems Internal Research and Development – led the 3 year development of an advanced dexterity robotic test platform for human robotic system forward projection. This ambidexterous semiautonomous robotic system employs the state of the art in advanced limb systems from the DARPA Revolutionizing Prosthetics Program and combines all advanced aspects of ground robotics including autonomy, haptic feedback, advanced dexterity, advanced mobility and stereo vision systems for full user-in-the-loop immersion and low-cognitive load control.

2003 – 2005: JHU/APL – Advanced Engineering and Development Group, National Security Technology Department

Engineer, US Customs counterproliferation effort, developed test plans and executed the testing and downselect of various CWA detectors through extensive testing at ECBC (Edgewood Chemical and Biological Center) using live chemical agents.

Tested and jointly developed methodology for confirmatory CWA detection using Bruker Viking GC/MS at ECBC using live agents.

Tested newly developed confirmatory methodologies and downselected CWA detector at two week pilot site deployment at a North Dakota border crossing with Laboratory Scientific Services Branch of US Customs and Border Protection.

Tested BDS system for the US Postal Service

1999 –2003: Adaptive Systems and Structures Laboratory, Duke University, Durham, NC

Graduate Research Assistant, Active Noise and Vibration Control, developed a new control methodology for low bandwidth (~0-5kHz) vibration control that guarantees stability and can be implemented with little or no extensive controls engineering background.

Summer 1998,1999: L-3 Communications Systems, Camden, NJ

Mechanical Engineering Intern, performed structural analysis for various Orbital Replacement Units for the International Space Station, developed an analysis methodology and software tool to determine margins of safety for threaded preloaded fasteners.

Summer 1997: Garro/GEBO Automated Production Systems, Cinnaminson, NJ

Mechanical Engineering Intern, worked as a mechanical design engineer prototyping parts for conveyor systems and integrating shop production modifications and engineering designs into finalized parts blue prints and assembly drawings for electronic and hard copy assembly manuals.

Other:

2000-2002: Tutor for Duke University Peer Tutoring Program

Individualized advising and tutoring of up to 4 upperclass students per semester on a weekly basis in Physics I and II.

Fall 2001: Teaching Assistant

Supervised laboratory, developed experiments, collected data and assisted students with both laboratory and classroom work.

Academic Years 1995-1999: Assistant Office Manager for Dr. Yacov Y. Haimes, Director, Center for Risk Management in the University of Virginia Systems Engineering Department.

SKILLS AND CAPABILITIES

System Design and Optimization for Positive Real Vibration Control: Proficiency in system modeling, design, and implementation for collocated feedback control schemes; design for optimal damping

Dynamic System Modeling for Vibration Control: Adept in construction of structural system models, including sensor and actuator dynamics, structural-acoustic interactions, and electromechanical coupling between active elements and host structures; computer simulation using MATLAB/Simulink for model verification.

Experimental Design and Implementation: Vast knowledge and experience in design, setup, and data collection for vibration and acoustic feedback control; design and implementation of analog electronics including filters, amplifiers, and operational circuits; design and implementation of digital control systems; use of various types of sensors and actuators.

Experimental Hardware: Internal DSP's, Siglab; Accelerometers, laser vibrometers, PVDF, and other sensing equipment; loudspeakers, piezoelectric patches/stacks, shakers and other actuation devices; signal conditioning equipment including amplifiers, active/passive filters, etc.

Computer Proficiency: Operating systems – Mac, Unix, Windows/Windows NT; Applications – Windows software, dSPACE, Latex; Programming – MATLAB, Simulink, C++; Design – AutoCAD LT, AutoCAD 13, ProE

MAJOR PUBLICATIONS

M.V. Kozlowski, D.G. Cole, R.L. Clark. "A Comprehensive Study of the RL Series Resonant Shunted Piezoelectric: Part 1 - A Feedback Controls Perspective," ASME Journal of Vibration and Acoustics submitted Oct. 2004

M.V. Kozlowski, D.G. Cole, R.L. Clark. "A Comprehensive Study of the RL Series Resonant Shunted Piezoelectric: Part 2 – Robustness and Performance," ASME Journal of Vibration and Acoustics submitted Nov. 2004

M.V. Kozlowski, D.G. Cole, R.L. Clark. "Modeling and Experimental Verification using the Sensoriactuator Circuit for Passive Vibration Damping," Proceedings of the 9th International Symposium on Smart Structures and Materials, International Society for Optical Engineering, June, 2002, 227-237.

M.V. Kozlowski, D.G. Cole, and R.L. Clark. "Performance and Sensitivity Study on Sensoriactuator Circuits for Positive Real damping Schemes," 44th AIAA/ASME/ASCE/AHS Structures, Structural Dynamics, and Materials Conference, 2003.

M.V. Kozlowski. Positive Real Vibration Control Using the Adaptive Piezoelectric Sensoriactuator. Ph.D. Dissertation, Duke University, 2003.

L.W.Hunter, D.S.Lawrence, J.T.Wilkerson, M.V.Kozlowski, "Shipping Container Inspections by Passive Headspace Vapor Sampling", RAS-05-026, proceedings of the DHS Conference on Working Together - Research & Development Partnerships in Homeland Security, Boston (27-28 Apr-2005).

Environmental Characterization of Selected Ports of Entry for the Identification of Background Interferants, David S. Lawrence, Amy A. Hofstra, Matthew V. Kozlowski, George M. Murray, Eric J. Van Gieson, Rebecca F. Vertes, Jeffery C. Lesho (in progress).

Environmental Characterization of Selected Ports of Entry for the Identification of Background Interferants, David S. Lawrence, Amy A. Hofstra, Matthew V. Kozlowski, George M. Murray, Eric J. Van Gieson, Rebecca F. Vertes, Jeffery C. Lesho. Presented at the 2008 Annual Chemical and Biological R&D Technologies Conference, San Antonio, TX (Jan 08).

Environmental Characterization of Selected Ports of Entry for the Identification of Background Interferants, David S. Lawrence, Amy A. Hofstra, Matthew V. Kozlowski, George M. Murray, Eric J. Van Gieson, Rebecca F. Vertes, Jeffery C. Lesho. Presented at the Pittsburgh Conference, 12-17 March 06 and internally at the NSTD Staff Orientation Program (NSOP) Poster Session (28 June 06).

J.C. Lesho, E. J. Van Gieson, M.V. Kozlowski, D.S. Lawrence, D.P. Mendat, P. Stankovich Chemical Agent Sensor Test Bed Pilot Site Report Pembina, North Dakota, U.S. Customs & Border Protection Inspection Facility NSTD-05-141, May 2005.

D.S. Lawrence, J.L. Hurd, J.K. Chambers, E.J. Van Gieson, A.A. Hofstra, M.V. Kozlowski, G.M. Murray, J.C. Lesho Background Characterization at Pembina NSTD-05-068, Jan 2005.

M.V. Kozlowski, J.C. Lesho, E.J. Van Gieson, D.S. Lawrence U.S. Customs and Border Protection Chemical Agent Sensor Testing Down Select Report NSTD-05-047, Jan 2005.

HONORS

Scholarships:

Rodman Scholar at the University of Virginia

Union Privilege AFL-CIO Union MasterCard Scholarship

CWA Local 1038 Allyson Hill Memorial Scholarship

New Jersey Association of REALTORS Educational Foundation Cye Schwartz Memorial Scholarship

University of Virginia Timothy M. Grembowski Memorial Scholarship

University of Virginia Margaret Elinor George Memorial Scholarship

Anthony Beirne Memorial Foundation Educational Scholarship

Edward J. Bloustein State of New Jersey Distinguished Scholar

The College Board Advanced Placement Scholar Award

PROFESSIONAL SOCIETY MEMBERSHIP

American Society of Mechanical Engineers – 1998-present – President Duke University Chapter (1999-2001) Graduate Student Advisor Duke University Chapter (2001-2003)

American Institute of Aeronautics and Astronautics – 2003 – present – member.

SECURITY CLEARANCE

U.S. Secret