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RESEARCH, TEACHING, AND CONSULTING INTERESTS

Physics and Engineering of Pool/Billiards Equipment and Techniques; Modeling and Simulation of Dynamic Systems; Mechatronics Education.

WORK EXPERIENCE

COLORADO STATE UNIVERSITY

1991-present

Associate Professor of Mechanical Engineering. Courses taught: Mechatronics and Measurement Systems, Machine Design, Introduction to Robotics, Advanced Dynamics, Control Systems, Engineering Design, Mechanical Engineering Problem Solving, Dynamics of Machines, Introduction to Computing, Introduction to Design and Manufacturing, Capstone Design, Engineering Economics.

- Awards and Honors:

ASME Fellow, 2007; ASME Distinguished Lecturer, 2004-2007; CSU university-wide Board of Governors "Excellence in Undergraduate Teaching Award", 2004; CSU Preston Davis Teaching Award, 2003; College of Engineering (COE) Student Council "Best Professor" Award, 2010 and 2013; COE Abell Teaching Award, 1995; CSU Jack E. Cermak Advising Award, 1994.

OFFICE OF TECHNICAL SERVICES, WASHINGTON, D.C.

1998-1999

Research and development of 3D scanning and rapid prototyping applications. 3D graphics software development. Design and development of mechatronic systems.

UNIVERSITY OF TEXAS AT AUSTIN

1989-1990

- *Adjunct Assistant Professor in Civil Engineering (1990).*

Courses taught: Computer Aided Design, C and Graphics Programming, Automated Equipment Design, and Construction Automation and Simulation.

- *Post-Doctorate Fellow in Civil Engineering (1989-1990).*

Worked with a team to develop an automated paint spraying system, and helped to develop a heavy lift planning and simulation system. Work involved interaction with construction industry manufacturers, equipment owners, and contractors including Grove, Dupont, Bechtel, Brown&Root, BE&K, Dow, and other members of the Construction Industry Institute.

MCGRAW HILL PUBLISHING COMPANY

1988-1989

Developed and wrote steam table computer code for "Fundamentals of Engineering Thermodynamics," 2nd edition, by John R. Howell and Richard O. Buckius, McGraw-Hill, 1992.

WALK HAYDEL & ASSOCIATES ENGINEERS

1985-1986

Project management support and database programmer. Worked primarily with project management and planning and scheduling for the DOE Strategic Petroleum Reserves (SPR) Projects.

COMPUTER LANGUAGES AND ADVANCED SOFTWARE EXPERIENCE

PICBasic Pro, Visual C++, C, HTML, WebCT, JavaScript, Java, BASIC, FORTRAN, ASSEMBLY, LISP, PASCAL, GL, OpenGL, MOTIF, PHIGS, GKS, CATIA, ProEngineer, SolidWorks, CADAM, CAEDS, ALGOR, NASTRAN, IDEAS, AutoCAD, MicroStation, VP-Sculpt, MATLAB, MathCAD, Pinnacle Studio, Dreamweaver.

EDUCATION

UNIVERSITY OF TEXAS AT AUSTIN

1986-1989

Curriculum included all topics within the Mechanical Systems Area: Modeling, Robotics, CAD/CAM; and additional work in Finite Element Analysis, Operations Research, and Artificial Intelligence.

- PhD in Mechanical Engineering: December, 1989. Dissertation Title: "Automation of a Piping Construction Manipulator and Development of a Heuristic Application-Specific Path Planner"
- MS in Mechanical Engineering: August, 1987. Thesis Title: "Multipulley Belt Drive Mechanics: Creep Theory vs. Shear Theory"
- **GPA:** 4.00 (4.00 scale)
- Awards and Honors:
 - Perfect score (900) on GRE Engineering Subject Test, UT Professional Development Award, University Post-Doctorate Fellow.

UNIVERSITY OF NEW ORLEANS

1982-1986

- BS in Mechanical Engineering: May 1986.
- **GPA:** 4.00 in Engineering, 3.95 overall (4.00 scale), *Magna Cum Laude* graduate.

CONSULTING EXPERIENCE

- *University of Colorado Medical Center* (Denver, CO), high-speed video analysis of ocular medicine delivery, 2011.
- *Pitsco* (Pittsburg, PA), high-speed video analysis of CO₂-powered model race cars, 2009.
- *TDP* (Loveland, CO), golf and baseball ball trajectory sensing and analysis, 2008.

- *CueStix International* (Lafayette, CO), development and design of cue stick testing technology and equipment, 2007-2008.
- *DGA Engineering* (Fort Collins, CO), 3D scanning and mechatronics applications, 1999-2007.
- *Sakura Enterprises* (Israel), pool simulator physics, 2006-2007.
- *Woodward* (Fort Collins, CO), high-speed video analysis of large hydraulic valve actuator, 2006.
- *Tetrad Corporation* (Englewood, CO), high-speed video analysis of ultrasonic probes, 2006.
- *Advanced Response Corporation* (New York, NY), high-speed video analysis of personal massage devices, 2005.
- *Able Software* (Lexington, MA), 3D surface modeling software, 2005.
- *McKinley Medical* (Denver, CO), high-speed video analysis of medical device assembly, 2005.
- *Waterpik* (Fort Collins, CO), modeling, analysis, testing of automatic toothbrushes, 2002-2004.
- *Visible Productions and Biographics* (Fort Collins, CO), computer graphics modeling of anatomy, 1994-2002.
- *Foot Balance Systems Plus* (Miami, FL), acquiring and processing 3D foot scan data, 1998-2000.
- *Cyberware* (Monterey, CA), software for editing 3D digitized data, 1995-1998.
- *Wohlers Associates* (Fort Collins, CO), 3D digitizing and rapid prototyping applications, 1994-1998.
- *Oakley* (Irvine, CA), custom software for processing 3D digitized data, 1997.
- *Ultimetrix* (Columbus, OH), custom software for processing 3D foot scan data, 1995-1996.

PROFESSIONAL ORGANIZATIONS AND AFFILIATIONS

- *Registered Professional Engineer* (PE) in State of Colorado, 1993-present.
- *Fellow*, The American Society of Mechanical Engineers (ASME), 2007-present.
- *Director*, ASME Centennial Section, 1996-present.
- *Dean*, Billiard University, 2013-present.
- *Board Member*, Billiard Education Foundation (BEF) Board of Trustees, 2010-present.
- *Distinguished Lecturer*, "The Illustrated Principles of Pool and Billiards," ASME DLP Program, 2004-2007.
- *Head Judge*, ASME Student Design Contest, District E (formerly known as Region XII), 1996-2006.
- *Chair*, ASME Board on Student Affairs (BSA), 2001-2002.
- *Chair*, ASME Student Sections Committee (SSC), 1998-2001.
- *Member*, ASME Region XII Region Operating Board, 1997-2000.
- *Member*, ASME Marquee Design Contest Committee, 1997-1999
- *Member*, ASME Student Design Contest Committee, 1993-1999.
- *Senior Representative* for Region XII ASME Student Sections Committee, 1995-1997.
- *ASME Leadership Development Initiative (LDI) intern*, 1995-1996.
- *Chair*, ASME Centennial Section, 1994-1996.
- *Vice Chair*, ASME Centennial Section, 1993-1994.
- *Faculty advisor* of Colorado State University's ASME Student Section, 1991-1995.
- *Member* of ASME, 1984-present; *Member* of ASEE, 1993-present.

PUBLICATIONS AND RESEARCH

- author of over 150 published technical papers and articles.
- PI or co-PI on 30 grants and contracts totaling \$2.9M
- co-author of [Introduction to Mechatronics and Measurement Systems](#), textbook, McGraw-Hill, 1999, 2003, 2007, 2012.
- author of [Introduction to Mechatronics and Measurement Systems Laboratory Manual](#), FedX-Kinkos Custom Publishing, 2007, 2009, 2011, 2014.
- author of [High-speed Video Magic ... billiards and the world in super slow motion](#), instructional video DVD, DGA Press, 2007.
- author of “[VP-Sculpt](#)”, software package for editing and sculpting of 3D polygonal mesh surfaces, Visible Productions (Fort Collins, CO), 1994-2002.
- editor and contributor, Online Video Demonstrations (video_demos.colostate.edu), High-speed Videos (high_speed_video.colostate.edu), and Mechatronics Resources (mechatronics.colostate.edu) 2001-present.
- co-author, [How to Aim Pool Shots \(HAPS\)](#), a three-DVD instructional video series, 2014.
- co-author, [Billiard University \(BU\)](#), a three-DVD instructional video series, 2013.
- co-author, [The Video Encyclopedia of Pool Practice \(VEPP\)](#), a five-DVD instructional video series, 2012.
- co-author of [The Video Encyclopedia of Pool Shots \(VEPS\)](#), a five-DVD instructional video series, 2010.
- author of [The Illustrated Principles of Pool and Billiards](#), book, DVD, CD-ROM, and website (billiards.colostate.edu), *Sterling Publishing*, 2004.
- instructional columnist, [Dr. Dave's Illustrated Principles](#), *Billiards Digest* magazine, monthly, 2004-present.