CURRICULUM VITAE
September 2008

Spencer P. Magleby
Department of Mechanical Engineering
and
College of Engineering and Technology
Brigham Young University
Provo, UT 84602

EDUCATION

PhD Mechanical Engineering, University of Wisconsin-Madison, 1988.
Graduate Minor in Computer Science specializing in Artificial Intelligence.

MS Civil Engineering/Computer Graphics, Brigham Young University, 1983.

BS Civil Engineering, Brigham Young University, 1983.
Graduated cum laude, Outstanding Civil Engineering Graduate.

ACADEMIC POSITIONS AND EXPERIENCE

2005 – Present	Associate Dean, Fulton College of Engineering and Technology, Brigham Young University (BYU)
2003 – Present	Professor, Mechanical Engineering, BYU
1998 – 2005	Associate Chair, Department of Mechanical Engineering, BYU
1995 – 2003	Associate Professor, Mechanical Engineering, BYU
1989 – 1995	Assistant Professor, Mechanical Engineering, BYU
1995 – 2008	Director of Interdisciplinary Product Development Graduate Program, College of Engineering and Technology, BYU. Responsible to coordinate curriculum and policies with the Marriott School of Management, advise students, and manage the inter-disciplinary team of faculty instructors.
1996 - 2005	Director/Co-Director of Capstone Design Program, College of Engineering and Technology, BYU. Responsible for all aspects of the Capstone Program including supervising of staff, recruiting industrial projects, finances (about $450K per year), management of faculty coaches and part-time faculty.
2000 – 2005	Director, State of Utah Center of Excellence for Commercialization of Compliant Mechanisms. This Center employs both graduate and undergraduate students to foster the development and commercialization of new technologies and product applications related to compliant mechanisms.
1998 – 2001	Chair Department Development Committee: Responsible for directing all major development efforts within the department, with special emphasis on assessment and evaluation approaches.
1995 – 1998	Chair Faculty Search and Recruiting Committee, Department of Mechanical Engineering, BYU.

INDUSTRIAL EXPERIENCE AND SUMMARY

2000 – Present Expert Witness for patent and product litigation.

1997 – Present Industrial Consultant and Trainer on Product Development Practices.

1983 – 1989 Senior Engineer, General Dynamics (Now Lockheed-Martin) Fort Worth Division, Structural Design and CAD/CAM Engineering Groups. Responsible for evaluation and implementation of new CAD approaches for all aspects of aircraft production design. Instrumental in implementation of large-scale, modeling tools to improve design practices, provide enhanced product model databases for manufacturing, and eliminate need for metal mockups. Responsible for development of CAD/CAM practices on the F-16, A-12, and F-22 projects.

Directed research into new design creation and representation methods and related work in expert systems and analysis/manufacturing interfaces. Principal Investigator for R&D projects in the CAD/CAM area and technical lead for teams of 5 - 20 engineers on these projects. PhD dissertation was completed at General Dynamics with Department of Defense funding.

General Dynamics representative to industrial research consortiums working on improving capabilities for computer-based design and manufacturing of complex products.

PROFESSIONAL ACTIVITIES AND CONTRIBUTIONS

Planning Committee Member and Track Chair, 2010 Capstone Conference, Boulder, CO

Organizing Committee Member and Track Chair, 2007 Capstone Conference, Boulder, CO

Member of the American Society of Mechanical Engineers (ASME)

Plenary Organizer and Speaker, 2007ASME International Mechanical Engineering Education Conference.

Program Chair, 2006 ASME International Design Engineering Technical Conferences, Education Symposium.

Conference Co-Chair, 2004 ASME International Design Engineering Technical Conferences and Computers and Information in Engineering Conference.

Conference Chair, 2002 ASME Design Theory and Methodology Conference.

Program Chair, 2001 ASME Design Theory and Methodology Conference.

Paper Review Coordinator, ASME Design Theory and Methodology Conference 1999 and 2000.

Paper Reviewer for many papers associated with ASME design conferences and journals.

Invited panel participant on Capstone Programs at ASME Conferences.

Member of the American Society for Engineering Education (ASEE)

Chair of Merrifield Design Award Committee, 2005 – 2007.

Author of five articles published in the Journal of Engineering Education and International Journal of Engineering Education on Design and Capstone Programs.

Paper Reviewer for ASEE Journal of Engineering Education.

Author of articles for ASEE conferences and workshops.

Co-chair of international conference, Advances Capstone Education, sponsored by ASEE in 1994.

NSF Panel Reviewer 2006, 2008 (Career Grants).

Industrial and Educational Member of CAM-I, an industrial research consortium working towards creation of computer-based product development.

Participant in IGES, PDES, and STEP standardization efforts. CAM-I sponsored representative to STEP Organization in area of Applications Interface Specifications.

Program chair for conference on University Programs in Computer Aided Engineering, Design and Manufacturing (UPCAEDM) in 1991.

AWARDS

ASEE Fred Merryfield National Design Award, 2003. Awarded by the American Society for Engineering Education in recognition of distinguished accomplishments in Design Engineering. Honorarium and Departmental award.

Boeing Outstanding Educator Award, 2000. One of three finalists (along with two other BYU faculty) for this prestigious national award. Awarded for achievements related to Capstone Design Education.

Boeing Outstanding Educator Award, 1997. One of three finalists (along with two other BYU faculty) for this prestigious national award. Awarded for achievements related to Capstone Design Education.

James F. Lincoln Arc Welding Foundation Gold Award, Undergraduate Design Program, 1993. This is the most prestigious annual award given for student design projects. The Gold Award is second place in the nation. The submitted project was sponsored by Utah Medical Products.

TECHNICAL PUBLICATIONS

Archival Journal Publications in Review

Allen Mackay, David Smith, Spencer Magleby, Larry Howell and Brian Jensen, "Metrics for Evaluation and Design of Large-Displacement Linear-Motion Compliant Mechanisms," in review for publication in the ASME *Journal of Mechanical Design*.

Chase, R.P. Jr., Todd, R. H., Howell, L.L., Magleby, S.P., "A 3-D Chain Algorithm with Pseudo-rigid-body Model Elements," in review for publication in *Mechanics Based Design of Structures and Machines*.

Archival Journal Publications

Joseph Jacobsen, Brian Winder, Larry Howell and Spencer Magleby, "Lamina Emergent Mechanisms and Their Basic Elements" Accepted for publication in the ASME *Journal of Mechanisms and Robotics*.

Joseph Jacobsen, Guimin Chen, Larry Howell and Spencer Magleby, "Lamina Emergent Torsional (LET) Joint" accepted for publication in *Journal of Mechanism and Machine Theory*, 2009.

Peter Halverson, Larry Howell and Spencer Magleby, "Tension-based Multi-stable Compliant Rolling-contact Elements" *Mechanism & Machine Theory* (2009), doi:10.1016/j.mechmachtheory.2008.11.013 (a special issue associated with the 13th National Conference on Mechanisms and Machines, Bangalore, India, December 12-13, 2007, and based on the conference paper NaCoMM-2007-048).

Brian Winder, Spencer Magleby and Larry Howell, "Kinematic Representation of Pop-up Mechanisms", accepted for publication in the ASME *Journal of Mechanisms and Robotics*. Also in *Proceedings of IDETC/CIE 2007* as part of the 2007 ASME Mechanisms and Robotics Conference, Las Vegas, NV, Sept. 4-7, 2007, DETC2007-35505.

Christopher M. DiBiasio, Martin L. Culpepper, Robert Panas, Larry Howell and Spencer Magleby, **"**Comparison of Molecular Simulation and Pseudo-Rigid-Body Model Predictions for a Carbon Nanotube–based Compliant Parallel–guiding Mechanism," ASME *Journal of Mechanical Design*, Vol. 130, No. 4, pp. 042308-1 to 042308-7, 2008.

Brent Weight, Chris Mattson, Spencer Magleby and Larry Howell, "Configuration Selection, Modeling, and Preliminary Testing in Support of Constant-Force Electrical Connectors," Journal of Electronics Packaging, Transactions of the ASME, Vol. 129, September 2007, pp. 236-246.

Martin L. Culpepper, Christopher M. DiBiasio, Robert Panas, Spencer Magleby and Larry L. Howell, "Simulation of a Carbon nanotube–based compliant parallel–guiding mechanism: A nanomechanical building block", Applied Physics Letters 89, No. 20, 203111 (2006). Also selected for publication in the November 27, 2006 issue of Virtual Journal of Nanoscale Science & Technology.

G.S. Flory, S. A. Chen, L.A. Woltz, S. Magleby, and J.D. Higley, "A computerized apparatus designed to automatically dispense, measure, and record alcohol consumption by individual members of a rhesus macaque social group", accepted for publication in Methods (2006), Elsevier Inc.

Guerinot, A.E., Magleby, S.P., Howell, L.L., Todd, R.H., "Compliant Joint Design Principles for High Compressive Load Situations," Journal of Mechanical Design, Vol. 127, No. 4, pp. 774-781, 2005.

Ben Cannon, Todd Lilian, Spencer Magleby, Larry Howell and Matthew Linford "A Compliant End-Effector for Microscribing," Journal of Precision Engineering, Vol. 29, Issue 1, January 2005, pp. 86-94.

Crane, N.B., Howell, L.L., Weight, B.L., and Magleby, S.P., "Compliant Floating-Opposing-Arm (FOA) Centrifugal Clutch," Journal of Mechanical Design, Trans. ASME., Vol. 126, No. 1, pp. 169-177, 2004, and published in *Proceedings of 8th International Power Transmission and Gearing Conferences*, 2000 ASME Design Engineering Technical Conferences, Baltimore, Maryland, DETC2000/PTG-14451.

Cameron Boyle, Larry Howell, Spencer Magleby and Mark Evans, "Dynamic Modeling of Compliant Constant-Force Compression Mechanisms," Journal of Mechanism and Machine Theory, Vol. 38, No. 12, pp. 1469-1487, 2003.

Guilin Jiang, Travis L. Niederhauser, Steven D. Davis, Yit-Yian Lua, Bennion R. Cannon, Dorff, Larry L. Howell, Spencer P. Magleby, and Matthew R. Linford, "Stability of Alkyl Monolayers on Chemomechanically Scribed Silicon to Air, Water, Hot Acid and X-rays",

Journal of Colloids and Surfaces A: Physicochemical and Engineering Aspects. Vol. 226, (2003), issues 1-3, pp. 9-16.

Chris Mattson, Larry Howell and Spencer Magleby, "Development of Commercially Viable Compliant Mechanisms Using the Pseudo-Rigid-Body Model: Case Studies of Parallel Mechanisms," Journal of Intelligent Material Systems and Structures, Journal of Intelligent Materials Systems and Structures, March 2004, vol. 15, no. 3, pp. 195-202(8) and also published in *Proceedings of the Adaptive Structures and Material Systems Symposium*, ASME IMECHE, New York, New York, 2001.

John J. Parise, Larry L. Howell and Spencer P. Magleby, "Ortho-Planar Linear-Motion Springs," Journal of Mechanism and Machine Theory, Vol. 36, Numbers 11-12, 2001, pp. 1281-1300.

Jinsong Gao, Kenneth Chase and Spencer Magleby, "Generalized 3-D Tolerance Analysis of Mechanical Assemblies with Small Kinematic Adjustments," IIE Transactions, Journal of Design and Manufacturing, (1998) 30, 367-377.

Kenneth Chase, Jinsong Gao, Spencer Magleby and Carl Sorensen, "Including Geometric Feature Variations in Tolerance Analysis of Mechanical Assemblies," IIE Transactions (1996) 28, 795-807 (Formerly the Journal of Design and Manufacturing), 1996.

Kenneth Chase, Jinsong Gao and Spencer Magleby, "General 2-D Tolerance Analysis of Mechanical Assemblies with Small Kinematic Adjustments," Journal of Design and Manufacturing, (1995) Vol. 5, pp 263-274.

Spencer Magleby, Kenneth Gunn, and Carl Sorensen, "Service Oriented Integration Environment for CAD/CAM Systems" Invited submission for publication in special issue, Journal of Integrated Computer-Aided Engineering, Vol. 1, Number 2, 1993, pp. 157-166.

Books and Other Published Media

Linford, M.; Davis, R.; Magleby, S.; Howell, L.; Jiang, G.; Thulin, C. Invited Book Chapter: "Chemomechanical surface modification of materials for patterning" in Nano-lithography and Patterning Techniques in Microelectronics. Ed. by D.G. Bucknall, Woodhead Publishing and CRC Press, pp. 120-154, 2005.

Kenneth Chase, Spencer Magleby and Jinsong Gao, "Tolerance Analysis of 2-D and 3-D Mechanical Assemblies with Small Kinematic Adjustments," Invited Chapter in *Advanced Tolerancing Techniques*, John Wiley and Sons, 1997, pp. 103-137.

Edward J. Barkmeyer, James E. Fowler, and Spencer P. Magleby, "A Conceptual Architecture for a Mechanical Parts Production System based on STEP," Archived Publications of the National Institute of Standards and Technology, Gaithersburg, MD, NISTIR 4685, September, 1991.

Spencer Magleby and David Jackson, "A Standardized Application Interface for Geometric Modelers," Product Modeling for Computer-Aided Design, selected papers from the 3rd IFIP Workshop on Geometric Modeling, Rensselaerville, NY, June 1990, Elsevier Science Publishers, The Netherlands, 1991.

Conference Proceedings In Review

Reviewed Conference Proceedings

"A Proposed Extendable Classification Scheme for Compliant Mechanisms," DETC2009-87290

Cameron S. Andersen, Spencer P. Magleby, Larry L. Howell, "Principles and Preliminary Concepts for Compliant Mechanically Reactive Armour," Proceedings of the 2009 ASME/IEEE International Conference on Reconfigurable Mechanisms and Robots, London, England, U.K.

Brian Winder, Spencer Magleby and Larry Howell, "A Study of Joints Suitable for Lamina Emergent Mechanisms," Proceedings of the 2008 ASME International Design Engineering Technical Conferences, Mechanisms & Robotics Conference, Brooklyn, NY, August 3-6, 2008, DETC2008-49914.

Scott H. Brooks, Spencer P. Magleby, Peter A. Halverson and Larry L. Howell, "Type Synthesis of Compliant 5-bar Mechanisms with Application to Mechanical Disc Brakes," accepted for publication in the Proceedings of the 13th National Conference on Mechanisms and Machines (NaCoMM07), Bangalore, India, December 12-13, 2007, NaCoMM-2007-103.

Peter A. Halverson, Larry L. Howell and Spencer P. Magleby, "Tension-based Multi-stable Compliant Rolling-contact Elements," accepted for publication in the Proceedings of the 13th National Conference on Mechanisms and Machines (NaCoMM07), Bangalore, India, December 12-13, 2007, NaCoMM-2007-048.

Joseph O. Jacobsen, Larry L. Howell and Spencer P. Magleby, "Fundamental Components for Lamina Emergent Mechanisms," *Proceedings of the 2007 ASME International Mechanical Engineering Congress and Exposition*, November 10-16, 2007, Seattle, WA, IMECE2007-42311.

Steven Landon, Spencer Magleby and Brian Jensen, "A Compliant Rotating Joint for Deployable Wings on Small UAVs," Proceedings of the 2007 ASME International Design Engineering Technical Conferences, Mechanisms and Robotics Conference, Las Vegas, NV, DETC2007-35821. This paper received the Compliant Mechanisms Applications Best Paper Award.

Brian Winder, Spencer Magleby and Larry Howell, "Representations of Pop-up Paper Mechanisms," Proceedings of the 2007 ASME International Design Engineering Technical Conferences, Mechanisms and Robotics Conference, Las Vegas, NV, DETC2007-35505.

Alan McKay, Spencer Magleby and Larry Howell, "A Pseudo-Rigid Body Model for Rolling Contact Compliant Beams," Proceedings of the 2007 ASME International Design Engineering Technical Conferences, Mechanisms and Robotics Conference, Las Vegas, NV, DETC2007-35536.

Robert Chase, Robert Todd, Larry Howell and Spencer Magleby, "A Large Deflection Analysis Method for Lateral Torsional Buckling," Proceedings of the 2007 ASME International Design Engineering Technical Conferences, Mechanisms and Robotics Conference, Las Vegas, NV, DETC2007-34531.

Peter Halverson, Larry Howell, Brian Jensen and Spencer Magleby, "Concepts for Achieving Multi-Stability in Compliant Rolling-contact Elements," Proceedings of the 2007 ASME

International Design Engineering Technical Conferences, Mechanisms and Robotics Conference, Las Vegas, NV, DETC2007-34969.

Nathan Rasmussen, Robert Todd, Larry Howell, Spencer Magleby, "Investigation of Compliant Ortho-Planar Springs for Rotational Applications," Proceedings of the 2006 ASME International Design Engineering Technical Conferences, Mechanisms and Robotics Conference, Philadelphia, PA, DETC2006-99459.

Nathan Rasmussen, Jonathan Wittwer, Robert Todd, Larry Howell, Spencer Magleby, "A 3D Pseudo-Rigid-Body Model for Large Spatial Deflections of Rectangular Cantilever Beams," Proceedings of the 2006 ASME International Design Engineering Technical Conferences, Mechanisms and Robotics Conference, Philadelphia, PA, DETC2006-99465.

Dan Carroll, Spencer Magleby, Larry Howell, Robert Todd and Craig Lusk, "Simplified Manufacturing through a Metamorphic Process for Compliant Ortho-Planar Mechanisms," Proceedings of the 2005 ASME International Mechanical Engineering Conference and Exposition, Orlando, FL, IMECHE2005-82093.

Steven Landon, Spencer Magleby and Larry Howell, "Preliminary Concepts for Deployable Wings on Small UAVs Using Compliance," Proceedings of the 2005 ASME International Mechanical Engineering Conference and Exposition, Orlando, FL, IMECHE2005-82088.

Scott Brooks, Spencer Magleby and Larry Howell, "Grasping Mechanisms with Self-Centering and Force-Balancing Characteristics," Proceedings of the 2005 ASME International Design Engineering Technical Conferences, Long Beach, CA, September 2005, DETC2005- 85478.

Timothy Allred, Larry Howell, Spencer Magleby and Alexandre Guerinot, "Compliant Mechanism Configurations for Vehicle Suspension Systems," Proceedings of the 2004 ASME International Mechanical Engineering Conference and Exposition, IMECHE2004-59574.

Alex Guerinot, Spencer Magleby and Larry Howell, "Compliant Mechanisms Concepts for Prosthetic Knee Joints," Proceedings of the 2004 ASME International Design Engineering Technical Conferences, Mechanisms and Robotics Conference, Symposium on Medical Devices and Systems, Salt Lake City, Utah, September 2004, DETC2004-57416.

Gregory Bishop and Spencer Magleby, "A Review of Technology Push Product Development Models and Processes," Proceedings of the 2004 ASME International Design Engineering Technical Conferences, Design Theory and Methodology Conference, Salt Lake City, Utah, September 2004, DETC2004-57496

Danielle Johnson and Spencer Magleby, "Considering the Manufacturing Environment of Less-Developed Countries When Choosing Product Concepts," Proceedings of the 2004 ASME International Design Engineering Technical Conferences, International Engineering Design Conference, Salt Lake City, Utah, September 2004, DETC2004-57625.

Bart Frischknecht, Larry Howell and Spencer Magleby, "Crank-Slider with Spring Constant Force Mechanism," proceedings of the 2004 ASME Design Engineering Technical Conferences, Salt Lake City, Utah, September 2004, DETC2004-57206.

Ryan Weight, Larry Howell, Spencer Magleby, "Minimizing Performance Variation for the Compliant Floating-Opposing-Arm Clutch," Proceedings of the 2004 ASME International Mechanical Engineering Conference and Exposition, Anaheim, CA, November 2004, IMECE2004-59574.

Tim Allred, Larry Howell, Spencer Magleby and Robert Todd, "The Compliant A-Arm Suspension," proceedings of the 2003 ASME International Mechanical Engineering Conference and Exposition, Adaptive Structures and Material Systems Symposium, Washington, D.C., November 2003, IMECE2003/ASM-43259.

Matthew Strong, Spencer Magleby and Alan Parkinson, "A Classification Method to Compare Modular Product Concepts," Proceedings of the 29th ASME International Design Engineering Technical Conferences, Design Theory and Methodology Division, Chicago, Illinois, September 2003, DETC2003/DTM-48661.

Myles Christensen, Spencer Magleby, Larry Howell and Robert Todd, "A New Self-Adjusting CVT Configuration Using Compliant Mechanisms," proceedings of the 2002 ASME International Mechanical Engineering Conference and Exposition, Adaptive Structures and Material Systems Symposium, New Orleans, Louisiana, November 2002, IMECE2002/34000.

Brent Weight, Spencer Magleby and Larry Howell, "Selection of Compliant Constant-Force Mechanisms Based on Stress and Force Criteria," Proceedings of the 28th ASME International Design Engineering Technical Conferences, Mechanisms Division, Montreal, Ontario, Canada, September 2002, DETC2002/MECH34206.

Deanne Clements, Spencer Magleby and Larry Howell, "Using Compliant Mechanisms to Improve Manufacturability in MEMS," Proceedings of the 28th ASME International Design Engineering Technical Conferences, Mechanisms Division, Montreal, Ontario, Canada, September 2002, DETC2002/MECH34178.

Kyle Ellsworth, Spencer Magleby and Robert Todd, "A Study of the Effects of Culture on Refrigerator Design: Towards Design for Culture," Proceedings of the 28th ASME International Design Engineering Technical Conferences, Engineering Design Culture Division, Montreal, Canada September 2002, DETC2002/EDC-34383.

Chris Mattson, Larry Howell and Spencer Magleby, "Development of Commercially Viable Compliant Mechanisms Using the Pseudo Rigid-Body Model: Case Studies of Parallel Mechanisms," Proceedings of the 2001 ASME International Mechanical Engineering Conference and Exposition, Adaptive Structures and Material Systems Symposium, New York, NY, November 2001, IMECE2001/AD-23718.

Aaron Herring, Spencer Magleby, Larry Howell and Robert Todd, "High Production Manufacturing Considerations For Metallic Compliant Mechanisms With Long Thin Beams," Proceedings of the 27th ASME International Design Engineering Technical Conferences, Design for Manufacturing Division, Pittsburg, PA September 2001, DETC2001/DFM-21184.

Chris Mattson and Spencer Magleby, "The Influence of Product Modularity During Concept Selection of Consumer Products," Proceedings of the 27th ASME International Design Engineering Technical Conferences, Design Theory and Methodology Division, Pittsburg, PA, September 2001.

John Larsen, Spencer Magleby and Larry Howell, "An Engineering Approach to

Technology-Push Product Development," Proceedings of the 13th International Conference on Engineering Design, Glasgow, Scotland, U.K., August 2001, ICED01-C586/643, pp. 521-528.

Enrique Cahua, William Giauque, Spencer Magleby, Carl Sorensen and Robert Todd, "Suppliers to Multinationals: Opportunities for Increasing Manufacturing Capabilities in Less-Developed Countries," Integrating Design Education Beyond 2000, Proceedings of the 22nd SEED Annual Design Conference, September 2000, University of Sussex, Brighton, UK, ISBN 1 86058 265 6, pp. 201-207.

Nathan Crane, Larry Howell, Brent Weight and Spencer Magleby, "Design and Testing of a Compliant Floating-Opposing-Arm (FOA) Centrifugal Clutch", Proceedings of 8th International Power Transmission and Gearing Conferences, 2000 ASME Design Engineering Technical Conferences, Baltimore, Maryland, DETC2000/PTG-14451.

Clinton Mortensen, Brent Weight, Larry Howell and Spencer Magleby, "Compliant Mechanism Prototyping," Proceedings of the 26th ASME Design Engineering Technical Conferences, Mechanisms Division, Baltimore, MD, September 2000, DETC2000/MECH-14204.

John Parise, Larry Howell and Spencer Magleby, "Ortho-Planar Mechanisms," Proceedings of the 26th ASME Design Engineering Technical Conferences, Mechanisms Division, Baltimore, MD, September, 2000, DETC2000/MECH-14193.

Spencer Magleby, Greg Roach and Carl Sorensen," A Proposed Framework for Research in Forming Successful Engineering Design Teams," Proceedings of the 26th ASME Design Engineering Technical Conferences, Design Theory and Methodology Division, Baltimore, MD, September, 2000, DETC2000/DTM-14557.

Michael Berglund, Spencer Magleby and Larry Howell, "Design Rules for Selecting and Designing Compliant Mechanisms for Rigid-Body Replacement Synthesis," Proceedings of the 26th ASME Design Engineering Technical Conferences, Design Automation Division, Baltimore, MD, September, 2000, DETC2000/DAC-14225.

Alan Dutson, Robert Todd, Spencer Magleby and Brent Barnett, "Linking Engineers with the Voice of the Customer," Proceedings, Advances in Concurrent Engineering-CE2000, Seventh ISPE International Conference on Concurrent Engineering: Research and Applications, July 2000, pp. 68-75.

Robert Cvetko, Kenneth Chase and Spencer Magleby, "New Metrics for Evaluating Monte Carlo Tolerance Analysis of Assemblies," Proceedings of the 1998 ASME International Mechanical Engineering Congress and Exposition, Manufacturing Engineering Division Symposium, Anaheim, CA, Nov. 15-20, 1998.

Jinsong Gao, Kenneth Chase, and Spencer Magleby, "Global Coordinate Method for Determining Sensitivity in Assembly Tolerance Analysis," Proceedings, 1998 ASME International Mechanical Engineering Congress and Exposition, Manufacturing Engineering Division Symposium, Anaheim, CA, Nov. 15-20, 1998.

Jinsong Gao, Kenneth Chase, and Spencer Magleby, "Comparison of Assembly Tolerance Analysis by the Direct Linerarization and Modified Monte Carlo Simulation Methods," Proceedings of the 25th ASME Design Engineering Technical Conferences Design Engineering Division, Boston, MA, September 1995, pp 353-360.

Angela Trego and Spencer Magleby, "Virtual Reality Promises New Design Capabilities," Proceedings of the 24th ASME Design Engineering Technical Conferences, Flexible Assembly Systems Division, Minneapolis, MN, September, 1994.

David Richardson and Spencer Magleby, "Implementing the CAM-I Application Interface Specification with Unix Interprocess Communication," Proceedings of the 1992 ASME Database Symposium, San Francisco, CA, August 1992, pp. 81-89.

Spencer Magleby and Kenneth Gunn, "An Object-Oriented Environment for Product Modelers and Applications," Proceedings of the International Conference on Object-Oriented Manufacturing Systems, Calgary, Albert, Canada, May, 1992, pp. 98-103.

Abstract-Reviewed Conference Proceedings

Spencer Magleby, Ben Cannon, Larry Howell, Travis Niederhauser, Guilin Jiang, Yit-Yian Lua, Robert Davis, Adam Woolley and Matthew Linford, "Influence of Scribe Speed and Force on Chemomechanical Nanofunctionalized Features," Proceedings of the 2002 ASME International Mechanical Engineering Conference and Exposition, New Orleans, LA November 2002, IMECE2002/33554.

Perry Carter, Spencer Magleby, Tom Cazier and Ann Marie O'Connell, "Availability of DFA Knowledge During the Product Development Process," Proceedings of the 1996 International Forum on DFMA, Newport, RI, June 1996.

Avihu Goral, Spencer Magleby and Perry Carter, "Algorithms for Determining Part Symmetry and Envelope Dimensions from a CAD Solid Model," Proceedings of the 16th Annual Computervision Users Group Conference, Denver, CO, October 1994.

Avihu Goral and Spencer Magleby, "CAD-based Algorithm for Static Balancing of a Gimbaled Payload," Proceedings of the 16th Annual Computervision Users Group Conference, Denver, CO, October 1994.

Perry Carter, Spencer Magleby and Ann Marie O'Connell, "Towards the Automation of DFA Analysis through Integration with CAD," Invited paper, Proceedings of the 1994 International Forum on Design for Manufacture and Assembly, Newport, RI, June 1994.

Douglas Cheney, Spencer Magleby and Kenneth Chase, "Building on the CV-DORS 3D Modeler," Proceedings of the 14th Annual Computervision User Conference, Washington, D.C., September 1992.

Spencer Magleby, Paul Ranyak, David Sanford, David Jackson and Richard Bean, "Developing a Standardized Application Interface for Geometric Modelers," Proceedings of the International Design Productivity Conference, Honolulu, Hawaii, February, 1991.

Spencer Magleby, "Design by Functional Feature," American Society of Mechanical Engineers Winter Annual Meeting, Chicago IL, November 1988.

Presentations at Technical Meetings (in addition to those associated with conference proceedings)

Spencer Magleby, "Exploring Virtual Reality-Based Interfaces for CAD," Invited presentation, Virtual Reality '95 Conference and Exposition, Hosted by VR Techno Center, Gifu, Japan, January, 1995.

Spencer Magleby and Perry Carter, "Development of an Automated DFA Application Using 3D Solid Models," presentation at Ford Motor Company technical review meeting, Livonia, MI, December, 1993.

Spencer Magleby, "An Overview of the CAM-I Joint Integration Project," Invited Presentation to the Consortium for Advanced Manufacturing Sponsor Meeting, Minutes of the Joint CAM-I/IMAR Meeting, Long Beach, CA, November 1992.

Spencer Magleby and Kenneth Chase, "Integrating the CATS Modeler with CAD Systems – CATS 3D for CATIA," presentation at IBM technical review meeting, Poughkeepsie, NY, January, 1992.

Spencer Magleby, *AIS 2.0* "Implementation and Testing Final Report," Invited Presentation to the European Process Planning and Product Modeling Programs of CAM-I, Minutes of the Joint PMP/PPP Meeting, Munich, Germany, December 1991.

Spencer Magleby, "Standardizing the CATS Modeler," Invited Presentation at the Annual ADCATS Conference, Provo, UT, November, 1991.

Spencer Magleby, *AIS 2.0* "Implementation and Testing Final Report," Invited Presentation to the Process Planning and Product Modeling Programs of CAM-I, Minutes of the Product Modeling Program of CAM-I, Dallas, TX, September 1991.

Spencer Magleby, "Research in Design Systems and Standards at Brigham Young University," Invited Presentation of the Factory Automation Systems Division Seminar, National Institute of Standards and Technology, Gaithersburg, MD, June 1991.

Spencer Magleby, "Feature Based Design," Invited Presentation, Technical Session, Alliance with Industry Conference, Brigham Young University, Provo, UT, April 1991.

Spencer Magleby, "An Overview of the CAM-I Application Interface Specification," Proceedings of the Joint PDES Inc – CAM-I International Workshop on Standardized Interfaces to Product Data, St. Louis, MO, October 1990.

Spencer Magleby and David Jackson, "Towards a Standardized Application Interface for Product Modelers," International Federation for Information Processing Working Group 5.2 Workshop on Geometric Modeling, Rensselaerville, NY, June, 1990.

Spencer Magleby, "The Role of the Applications Interface Specification in Product Data Exchange," Invited Presentation, Proceedings of the Second CAM-I Application Interface Specification Workshop, Culver City, CA, February, 1990.

Spencer Magleby, "Exploiting Feature-Based Product Models in a CIM Environment," Minutes of the CAM-I Joint Technical Programs Meeting, San Diego, CA, February, 1990

Spencer Magleby, "Linking Design Requirements and Product Definition," Invited Presentation, CAM-I Technology Day, Arlington, TX, August 1989.

Spencer Magleby, "Using an Applications Interface Specification for Generative Solid Modeling." Proceedings of the CAM-I Application Interface Specification Workshop, Natick, MA, May 1988.

Other Technical Publications and Reports

Spencer Magleby, John Marshall, William Giauque and Graduate Students, "Final Report on Design and Development of an Automated Refueling System", submitted to Ford Motor

Company and New Generation Fueling, 1997. This report also contained a number of previous interim, technical reports submitted to Ford Motor Company.

Spencer Magleby, Hunter Shu, Peter Perremans, Gary Leininger, Kenneth Gunn, and Feyun Zhang, "CAM-I Integration Project Final Report," Submitted for distribution to the Institute for Manufacturing and Automation Research, Arlington, TX, 1994.

Spencer Magleby, Carl Sorensen, and Robert Todd, "Integrated Product and Process Design Course, Introductory Video for Students," Report to the Society of Manufacturing Engineers, June 1992.

Kenneth Gunn and Spencer Magleby, "FORTRAN Language Binding for the AIS 2.0." Provided to CAM-I for submittal to the American National Standards Institute as and international standard for CAD systems, January, 1991.

David Richardson and Spencer Magleby, "Implementing the AIS Using Interprocess Communication," Special report donated to the technical programs of CAM-I, Report Number DR-91-PMP-01, Arlington, TX, September 1991.

Feyun Zhang, Spencer Magleby, "Suggested Changes and Modifications to the AIS 2.0," Report to the Product Modeling Program of CAM-I, Report Number R-91-PMP-01, Arlington, TX, September 1991.

David Jackson and Spencer Magleby, "Testing and Developing the AIS Using a 3D Tolerance Modeling Application," Report to the Product Modeling Program of CAM-I, Report Number PS-91-PMP-01, Arlington, TX, September 1991.

Spencer Magleby, Kenneth Chase, David Jackson and Glen Larson, "An Approach to the Integration of the AIS and Tolerance Analysis Applications," Report to the Product Modeling Program of CAM-I, Report Number PS-91-PMP-01, Arlington, TX, December 1990.

ENGINEERING DESIGN EDUCATION PUBLICATIONS

Archival Journal Publications in Review

none

Archival Journal Publications

Robert Todd, Spencer Magleby and Alan Parkinson**,** "Experiences and Observations in Introducing Students To Design and Manufacturing Globalization," SME Journal of Manufacturing Systems, Vol 24, No. 3, 2006.

Christopher Lewis, Spencer Magleby and Robert Todd, "Learning to Design Products in Environments with Limited Design Traditions", International Journal of Engineering Education, Vol. 21, No. 3, 2006.

Robert Todd and Spencer Magleby, "Elements of a Successful Capstone Course Considering the Needs of Stakeholders," European Journal of Engineering Education, Vol. 30, No. 2, May 2005, pp. 203-214.

Robert Todd and Spencer Magleby, "Evaluation and Rewards for Faculty Involved in Engineering Design Education," International Journal of Engineering Education, Vol. 20, No. 2, 2004.

Robert H. Todd, W. Edward Red, Spencer P. Magleby and Steven Coe, "A Case for Manufacturing Education," Journal of Engineering Education, Vol. 90, No. 3, 2001.

Dorothy G. Taylor, Spencer P. Magleby, Robert H. Todd and Alan R. Parkinson, "Training Faculty to Coach Capstone Design Teams," International Journal of Engineering Education, Vol. 17, No. 4, 2001, pp. 353-358.

Spencer P. Magleby, Robert H. Todd, Carl Sorensen and Len Pugh, "Recruiting and Selecting Appropriate Industrial Projects for Capstone Design Programs," International Journal of Engineering Education, Vol. 17, No. 4, 2001, pp. 400-405.

Alan Dutson, Robert Todd and Spencer Magleby, "A Review of Literature on Teaching Engineering Design Through Project-Oriented Capstone Courses," Journal of Engineering Education, January 1997, pp. 17 – 28.

Robert Todd, Spencer Magleby, Carl Sorensen, Bret Swan and David Anthony, "A Survey of Capstone Engineering Courses in North America," Journal of Engineering Education, April, 1995, pp. 165-174.

Robert Todd, Carl Sorensen and Spencer Magleby, "Designing a Senior Capstone Course to Satisfy Industrial Customers," Journal of Engineering Education, Volume 82, April, 1993, pp. 92-100.

Conference Proceedings in Review

none

Reviewed Conference Proceedings

Gregg Warnick, Spencer Magleby, Robert Todd and Alan Parkinson, "Globalization: A New Frontier for Capstone Courses", Proceedings of the 2008 ASEE Annual Meeting, Pittsburg, PA.

Alan Parkinson, John Harb, Spencer Magleby and Chelita Pate, "Extending our Reach: What We Have Learned in Two Years of Engineering Study Abroad Programs", Proceedings of the 2008 ASEE Annual Meeting, Pittsburg, PA. Recipient of Best Paper award in the International Division.

John Harb, Richard Rowley, Spencer Magleby and Alan Parkinson, "Going Global: Implementation of a College-wide Initiative to Prepare Engineering and Technology Students for the 21st Century", Proceedings of the 2007 ASEE Annual Meeting, HI.

Robert Todd and Spencer Magleby, "Creating a Process to Design a Capstone Program that Considers Stakeholder Values," Proceedings of the ASEE 2004 Annual Meeting, Salt Lake City, Utah USA, June, 2004.

Robert H. Todd, W. Edward Red, Spencer P. Magleby and Steven Coe, "A Case for Manufacturing Education," Proceedings of the International Seminar on Manufacturing Technology Beyond 2000, pp 85-91, Sponsored by The Indian National Academy of Engineering, Bangalore, India, November 1999.

Spencer Magleby, Robert Todd and Carl Sorensen, "Fostering an Educational Environment for Integrated Product and Manufacturing Process Design," Proceedings of the International Conference on Education in Manufacturing, Society of Manufacturing Engineers, March, 1996, San Diego, CA, ER96-209.

Carl Sorensen, Robert Todd, Spencer Magleby, and Alan Parkinson, "Re-Engineering Design Education: Design Process and Learning Activities," Proceedings of the 24th ASME Design Engineering Technical Conferences, Design Theory and Methodology Division, Minneapolis, MN, September, 1994, pp. 315-322.

Robert Todd, Spencer Magleby, Carl Sorensen, Bret Swan and David Anthony, "A Survey of Senior Project or Capstone-Type Engineering Courses in North America," Proceedings of the Advances in Capstone Education Conference, Brigham Young University, Provo, UT, August 1994, pp. 3-12.

Bret Swan, Spencer Magleby, Carl Sorensen and Robert Todd, "A Preliminary Analysis of Factors Affecting Engineering Design Team Performance," Proceedings of the ASEE 1994 Annual Meeting, Edmonton, Alberta, Canada, June, 1994.

Joseph Free, Craig Gygi, Robert Todd, Carl Sorensen and Spencer Magleby, "Strategies for Developing Robust Teamsmanship in the Context of Design Education for Product Development: A Progress Report," Proceedings of the 1993 Frontiers in Education Conference, Washington, DC, November 1993, pp. 482-488.

Ken Stoddard, Carl Sorensen, Spencer Magleby and Robert Todd, "Capstone Design Team Success Metrics Using Factorwise Correlation," Proceedings of the 1993 ASEE Annual Conference, Educational Research and Methods Division, June, 1993.

Robert Todd, Carl Sorensen and Spencer Magleby, "Redesigning the Senior Capstone Course to Meet the Changing Needs of Industry," Proceedings of the ASEE Manufacturing Division, 1992 ASEE Annual Conference, Toledo, OH, June, 1992.

Abstract-Reviewed Conference Proceedings

Gregg Warnick, Spencer Magleby, Robert Todd and Alan Parkinson, "Globalization: The New Frontier for Capstone Programs", Proceedings of the National Capstone Design Course Conference, University of Colorado at Boulder, June 2007.

Spencer Magleby, Robert Todd and Alan Parkinson, "Learning About Global Product Development through Travel-Based Courses: Student Feedback", Proceedings of the 2006 ASEE Global Colloquium on Engineering Education, Rio de Janiero, Brazil, October 2006, paper GC 2006-166.

Robert Todd, Spencer Magleby and Alan Parkinson**,** "Experiences and Observations in Introducing Students To Design and Manufacturing Globalization" Proceedings of the Looking Forward: Innovations in Manufacturing Engineering Education Conference, Society of Manufacturing Engineers, California Polytechnic State University, San Luis Obispo, June 2005, pp. 239-246.

Christopher Lewis, Spencer Magleby and Robert Todd, "Learning to Design Products in Environments with Limited Design Traditions", Proceedings of the 2005 Mudd Design Workshop V, Claremont, CA, May 2005.

Robert Todd and Spencer Magleby, "Evaluation and Rewards for Faculty Involved in Engineering Design Education," Proceedings of the Mudd Design Workshop IV, Claremont, CA, July 2003.

Robert Todd and Spencer Magleby, "Creating a Successful Capstone Program by Considering the Needs of Stakeholders," Proceedings of the Ibero-American Summit on Engineering Education, Sao Paulo, Brazil, March 2003.

Dorothy Taylor, Spencer Magleby, Robert Todd and Alan Parkinson, "Training Faculty to Coach Capstone Design Teams," Proceedings of the Mudd Design Workshop II, Claremont, CA, May 1999.

Spencer P. Magleby, Robert H. Todd and Len Pugh, "Recruiting and Selecting Appropriate Industrial Projects for Capstone Design Programs," Proceedings of the Mudd Design Workshop II, Claremont, CA, May 1999.

Robert Todd, Spencer Magleby and Carl Sorensen, "Integrated Product and Process Design: Industry and Academia Working Together to Develop a Senior Capstone Design Course," Proceedings of the SME AUTOFACT '91 Conference, Chicago, IL, November 1991. Also distributed by the Society of Manufacturing Engineers as Technical Paper # ER91-544.

Spencer Magleby, Carl Sorensen and Robert Todd, "Integrated Product and Process Design: Development of a Joint Capstone Design Course in Mechanical and Manufacturing Engineering," Proceedings of the Frontiers in Engineering Education 1991 Conference, West Lafayette, IN, September 1991, pp. 469-474.

Presentations and Panels at Professional Meetings

Spencer Magleby, "Industry-University Educational Partnerships for the New Millennium: Experiences and Lessons Learned," Invited Panel Member, 2001 ASME International Mechanical Engineering Conference and Exposition, New York, NY, November 2001.

Spencer Magleby and Robert Todd, "Elements of a Successful Capstone Program with Industrial Sponsors," Invited Presentation, Proceedings of the 2001 ASME International Mechanical Engineering Conference and Exposition, New York, NY, November 2001.

Spencer Magleby and Robert Todd, "Report on Activities Since MDII: Teaching Faculty to Coach," Mudd Design Workshop III, Claremont, CA, May 2001.

Spencer Magleby, Carl Sorensen, William Giauque and Doug Stout, "Programmatics, Curriculum, and Research of the Interdisciplinary Product Development Program," presentation to NASA reviewers and other grant recipients, NASA Langley Research Center, VA, December 1995.

Spencer Magleby, Robert Todd and John Marshall, "Training Successful Product Developers: An Interdisciplinary Educational Program," Invited Presentation to the Corporate Design Foundation's Design Leadership Symposium, Proceedings distributed to Foundation Members, Palisades, NY, August 1995.

Spencer Magleby, Carl Sorensen and Robert Todd, "Integrated Product and Process Design: Development of a Joint Capstone Design Course in Mechanical and Manufacturing Engineering," (extended abstract published in Proceedings) ASEE Rocky Mountain Section Annual Spring Meeting, Brigham Young University, Provo, UT, April 1991.

GRANTS AND FUNDING AWARDS

National Science Foundation, $12,000, 11/08 - , *REU Supplement*, NSF Award No. CMMI-0800606, L.L. Howell (PI), S.P. Magleby (Co-PI).

National Science Foundation, $270,060, 7/08-6/11, *Lamina Emergent Mechanisms*, NSF Award No. CMMI-0800606, L.L. Howell (PI), S.P. Magleby (Co-PI).

TaylorMade Golf Company Inc., $29,000, *Software for Phase III Development*, January 2006. Jointly with Larry Howell (Co-PI).

Nokia Research Center, $125,000 *Development of Compliant Mechanism Motion Components & Concepts for Employing Compliance in Communication Devices,* May 2005. Jointly with Larry Howell (PI) and Brian Jensen (Co-PI).

TaylorMade Golf Company Inc., $81,750, *Phase III Development of the Tension-Spoke Concept,* March 2005. Jointly with Larry Howell (Co-PI).

TaylorMade Golf Company Inc., $19,500, *Software for Phase III Development,* January 2005. Jointly with Larry Howell (Co-PI).

State of Utah Center of Excellence, $56,000, *Utah Center of Excellence for Compliant Mechanism Development and Commercialization*, July 2004. Jointly with Larry Howell (Co-PI) and Robert Todd (Co-PI).

State of Utah Center of Excellence, $17,000, *Utah Center of Excellence for Compliant Mechanism Development and Commercialization*, July 2003. Jointly with Larry Howell (Co-PI).

TaylorMade Golf Company Inc., $124,000, *Development and Testing of Innovative Golf Club Heads*, June 2003. Jointly with Larry Howell (Co-PI).

State of Utah Center of Excellence, $130,000, *Utah Center of Excellence for Compliant Mechanism Development and Commercialization*, July 2002. Jointly with Larry Howell (Co-PI).

TaylorMade Golf Company Inc., $49,580, *Development and Testing of Innovative Golf Club Heads,* August 2001. Jointly with Larry Howell (Co-PI).

State of Utah Center of Excellence, $130,000, *Utah Center of Excellence for Compliant Mechanism Development and Commercialization*, July 2001. Jointly with Larry Howell (Co-PI).

Recreation Systems Inc, $30,000, *Design and Development of a Compliant Continuously Variable Transmission*, October 2000. Jointly with Larry Howell (Co-PI).

State of Utah Centers of Excellence, $120,000, *Utah Center of Excellence for Compliant Mechanism Development and Commercialization*, July 2000. Jointly with Larry Howell (PI).

Visteon (Ford Motor Company), $43,500, *A Model for Managing Single-Piece-Flow to Batch-Flow Manufacturing System Interfaces,* January 2000. Jointly with Alan Parkinson (Co-PI).

State of Utah Center of Excellence, $110,000, *Utah Center of Excellence for Compliant Mechanism Development and Commercialization*, July 1999. Jointly with Larry Howell (PI).

Computervision User Group, $10,000, (unrestricted grant) *Design for Assembly CAD Application Development,* May 1996, Jointly with Perry Carter.

New Generation Fueling, $150,000, *Development of an Automated Automobile Fueling System*, Jan 1996, Jointly with Carl Sorensen (Co-PI), John Marshall (Co-PI Industrial Design), and William Giauque (Co-PI Marriott School of Business).

Boeing Computer Services, $20,000, *Preliminary Assessment of CAD Assembly Tolerancing Tools*, October 1995. Jointly with Ken Chase (PI).

Lockheed Martin Tactical Aircraft Systems, $13,000, *Integration of CATS and Catia-Based Tolerance Definition and Modeling Systems*, November, 1995. Jointly with Ken Chase Co-PI).

National Aeronautics and Space Administration, $608,500, *Multidisciplinary Product Development Program*, August, 1994. Jointly with Brent Barnett (Co-PI Marriot School of Business), John Marshall (Co-PI Industrial Design), Carl Sorensen (Co-PI Manufacturing Engineering), and Robert Todd (Co-PI Manufacturing Engineering).

Office of Naval Research, $93,800, *Tolerance Analysis of Composite Structures*, August, 1994. Member of proposal team headed by Ken Chase (PI) and including Chris Rotz (Co-PI).

National Science Foundation, $5,000, *Advances in Capstone Education Conference*, March, 1994. Jointly with Robert Todd (PI) and Carl Sorensen (Co-PI).

Ford Motor Company, $59,500, *Automated Design for Assembly Evaluation from a CAD Model*, March, 1994. Jointly with Perry Carter (Co-PI).

National Aeronautics and Space Administration, $50,000, *A Graduate Program in Multidisciplinary Design and Analysis Methods*, September 1993. Jointly with Carl Sorensen (PI) and Robert Todd (Co-PI).

State of Utah Centers of Excellence Program, $9,700, *Planning Grant for Establishment of a Center for New Product Development*, November, 1992. Jointly with Robert Todd (PI) and Carl Sorensen (Co-PI).

Ford Motor Company, $50,000, *Automated Design for Assembly Evaluation from a CAD Model*, November, 1992. Jointly with Perry Carter (Co-PI).

IBM Corporation, *IBM Joint Study: 1992-93 Concurrent Engineering*, $72,000 of Internal College Funding made available through IBM, August 1992. Jointly with Carl Sorensen (Co-PI) and Robert Todd (Co-PI).

Computer Aided Manufacturing-International, $154,000, *Integration of CAM-I Product Development Software Systems,* July 1991.

National Institute of Standards and Technology, $1,800, *Development of Standardized Programming Interfaces*, May 1991.

Society of Manufacturing Engineers, $5,000, *Integrated Product and Process Design Curriculum Development,* May 1991. Jointly with Carl Sorensen and Robert Todd.

Computer Aided Manufacturing-International, $9,700, *Coordination of the CAM-I AIS and STEP Data Standard,* August 1990.

Computer Aided Manufacturing-International, $8,300, *Implementation of the AIS Version 2.0 for Parasolid,* June 1990.

Computer Aided Manufacturing-International, $20,700, *Implementation of the AIS Version 2.0 for PADL2,* June 1990. Jointly with Kenneth Chase (Co-PI).

Computer Aided Manufacturing-International, $62,000, *Using the AIS for 3D Tolerance Analysis Applications*, February 1990. Jointly with Kenneth Chase (Co-PI).

Computer Aided Manufacturing-International, $9,300, *Chairmanship of a PDES/AIS Technical Committee,* August 1989.

BYU Internal Grants

BYU College of Engineering and Technology Research Initiation Grant, $7,000, *Silicon Scribing System to Produce Chemomechanical Nanofunctiuonalized Features*, January 2003.

BYU College of Engineering and Technology Research Initiation Grant, $6,500, *Silicon Scribing System to Produce Chemomechanical Nanofunctiuonalized Features*, October 2002.

BYU Office of Technology Transfer, $4,000, *Development of an Automated Trailer Back-up Device*, 1997.

BYU College of Engineering and Technology Teaching Grant, $4,350, *A Survey of Capstone Programs in Engineering Education*, June 1993. Jointly with Carl Sorensen and Robert Todd.

BYU College of Engineering and Technology Research Initiation Grant, $6000, *Follow-On Proposal Preparation for CAD/CAM Integration*, May 1993.

BYU College of Engineering and Technology Research Initiation Grant, $5,500, *Increasing Design Productivity by Applying Artificial Reality Technology to CAD*, August 1992.

BYU College of Engineering and Technology Teaching Development Grant, $6,000, *Improving the Capstone Design Experience Through Design Methods Research*, May 1992. Jointly with Carl Sorensen and Robert Todd.

BYU College of Engineering and Technology Research Grant, $3,500, *Preparation of a Proposal to Fund Enhancement of the ME/MFE Senior Capstone Design Program* , June 1992. Jointly with Carl Sorensen and Robert Todd.

BYU College of Engineering and Technology Teaching Development Grant, $6,000, *Improved Undergraduate Design Education by Using the Senior Capstone Class as a Research Laboratory for Improved Design Methods*, May 1991. Jointly with Carl Sorensen and Robert Todd.

BYU College of Engineering and Technology Research Fellowship, $6,000, *Feature Technology Testbed for Mechanical Products*, July 1990. Jointly with Val Hawks.

PENDING GRANTS AND AWARDS

None.

OTHER INDUSTRIAL SUPPORT

Capstone – External grants to support the BYU Capstone Program are solicited by faculty and a staff manager. Grants average $18,000 per project. During some years I had very significant involvement in obtaining these grants:

2002 – 2005: Total funding of $1,300,000. As Director of the Program I had ultimate responsibility for the grants and made significant efforts in working with potential sponsors.

1998 – 2000: Total funding of $900,000. As Director of the Program I had ultimate responsibility for the grants and made significant efforts in working with potential sponsors.

1995 – 1997: Total funding of $800,000. As Co-Director I shared overall responsibility with another faculty and worked directly with a number of potential sponsors.

IPD Projects – A number of companies and BYU-internal entities have sponsored projects associated with the graduate Interdisciplinary Product Development program. This support typically includes all direct costs of the project and can range from $1,000 to $2,000. This

funding was administered through the Marriot School of Management. Sponsors have included: Makita USA (three projects with power tools, supplied equipment and paid travel), Becton Dickenson (two projects with catheter systems, supplied about $2,000/project), BYU Office of Technology Transfer, BYU research groups, Novell, Nocturnal Engineering, and others.

PATENTS AND LICENSES

Issued

Continuously Variable Transmission or Clutch with Ortho-Planar Compliant Mechanism, Whiting, M.J., Howell, L.L., Todd, R.H., Magleby, S.P., Anderson, M.C., and Rasmussen, N.O., U.S. Patent No. 7,338,398, issued March 4, 2008, assigned to Brigham Young University

Substantially Constant-Force Resistance Machine, Howell, L.L. and Magleby, S.P., U.S. Patent No. 7,060,012, issued June 13, 2006, assigned to Brigham Young University.

Constant Force Apparatus and Method, Weight, B.L., Mattson, C.A., Magleby, S.P., Howell, L.L., and Brown, B.J., U.S. Patent No. 6,945,800, issued September 20, 2005, assigned to Brigham Young University, licensed to ATL.

Multi-Layered Compliant Mechanisms and Method of Manufacture, Todd, R.H., Howell, L.L., Magleby, S.P., and Herring, A.L., U.S. Patent No. 6,757,975, issued July 6, 2004, assigned to Brigham Young University.

Tracked Bicycle, Cheney, D. (Capstone sponsor), Magleby, S. P. and undergraduate students U.S. patent 6,663,117, issued December 2003, assigned to Cheney Enterprises.

Automatic Fueling System and Components Therefor, U.S. patent 6,640,846, , November 2003, Strnad R. S. (research sponsor), Magleby, S. P., John Marshall, W. Douglas Stout, Carl Sorensen, and graduate students.

Automatic Fueling System and Components Therefor, U.S. patent 6,024,137, February 2000, Strnad R. S. (research sponsor), Magleby, S. P., John Marshall, W. Douglas Stout, Carl Sorensen, and graduate students.

Pending

"Guided-end Condition Method Used to Create Carbon Nanotube-based Mechanisms," Culpepper, M.L., DiBiasio, C., Panas, R., Magleby, S.P., Howell, L.L., assigned to Massachusetts Institute of Technology and Brigham Young University.

Provisional Pending

"Out-of-Plane Morphing Mechanism Manufactured from Flat Sheets," L.L. Howell, Magleby, S.P., Bassett, E.K., Mackay, A.B., Winder, B.G., assigned to Brigham Young University.

"A Compliant Device Capable of Large Angle Rotations and Multiple Degrees of Freedom and its Application as a Prosthetic Joint," Halverson, P., Howell, L.L., Magleby, S.P., assigned to Brigham Young University.

"Compliant Rolling-contact Element (CORE) that allows for constrained large angle rotation between two rigid bodies; without friction or sliding, including the creation of stable

positions," Howell, L.L., Halverson, P., Magleby, S.P., Winder, B., assigned to Brigham Young University.

"A compliant mechanism with three stable equilibrium positions," Pendleton, T., Jensen, B.D., Howell, L.L., and Magleby, S.P., assigned to Brigham Young University.

"Compliant Snap-Through Buckled Beam Mechanism to Translate Components in Handheld Electronic Devices," Howell, L.L., Magleby, S.P., Mackay, A., Jacobsen, J., assigned to Brigham Young University.

CONSULTING

Clayton, Howarth and Canyon, 2005, Patent infringement and invalidation expert witness.

National Institute of Health, 2004, Development of Autonomous Alcohol Dispensing Systems for Monkey Research.

Hatch, James & Dodge, P.C., 2002 - 2004, Product Design Expert Witness.

Recreation Systems Inc, 2002, Product Evaluation and Report.

Hill, Johnson and Schmutz, 2001, Product Performance Assessment.

Flowserve, 1999-00, Product Development Training Classes and Seminars.

DAW Technologies, 1996-97, Product Development Training Classes, Seminars and reviews.

Computer-Aided Manufacturing-International, 1993, Special study for ANSI standards preparation.

Computer-Aided Manufacturing-International, 1991, Statement of Work for Integration of Product Development Software Systems.

National Institute of Health, 1991-92, Development of an Alcohol Dispensing System for Monkey Research.

MENTORING, THESES AND GRADUATE ADVISING

Brian Winder, MS Thesis, Mechanical Engineering, 2008, *Design Principles for Lamina Emergent Mechanisms*

Cameron Anderson, MS Thesis, Mechanical Engineering, 2007, *Design Principles for Compliant Mechanically reactive Armor*

Allen Mackay, MS Thesis, Mechanical Engineering, 2007, *Large Displacement Linear-Motion Compliant Mechanisms*

Steven Landon, MS Thesis, Mechanical Engineering, 2007, *Development of Deployable Wings for Small Unmanned Aerial Vehicles Using Compliant Mechanisms*

Aaron Hopkinson, MS Thesis, Mechanical Engineering, 2006, *Evaluating the Application of Modularity to Reduce Market Risk in Technology-Push Products*

Aaron Robison, MS Thesis, Mechanical Engineering, 2006, *Evaluating the Application of Modularity to Reduce Market Risk in Technology-Push Products*

Marc Whitezel, MS Thesis, Mechanical Engineering, *Evaluating the Application of Modularity to Reduce Market Risk in Technology-Push Products*

Tools and Metrics for Evaluating Modular Product Concepts Based on Strategic Objectives, Matthew Strong, MS Thesis, Mechanical Engineering,

A Detailed Approach for Concept Generation and Evaluation in a Technology Push Product Development Environment, Andrew S. Nelson, MS Thesis, Mechanical Engineering, December 2005.

Preliminary Design Approach for Prosthetic Ankle Joints Using Compliant Mechanisms, Jason Wiersdorf, MS Thesis, Mechanical Engineering, December 2005.

A Comprehensive Model for Technology Push Product Development, Gregory L. Bishop, MS Thesis, Mechanical Engineering, April 2004.

Selecting Appropriate Product Concepts for Manufacture in Developing Countries, Danielle Johnson, MS Thesis, Mechanical Engineering, April 2004.

Design and Analysis of End-Effector Systems for Scribing on Silicon, Bennion Cannon, MS Thesis, Mechanical Engineering, December 2003.

Design of Compliant Mechanisms for Grasping with Application to Mechanical Disc Brakes, Scott Brooks, MS Thesis, Mechanical Engineering, August 2003.

Compliant Mechanisms Subjected to Compressive Loads, Alexandre Guerinot, MS Thesis, Mechanical Engineering, March 2003.

Design of High Coefficient of Restitution Compliant Mechanisms, Brandon Wooley, MS Thesis, Mechanical Engineering, December 2002.

Tools and Metrics for Evaluating Modular Product Concepts Based on Strategic Objectives, Matthew Strong, MS Thesis, Mechanical Engineering, December 2002.

Metamorphic Process for Compliant Ortho-Planar Mechanism Design, Daniel Carroll, MS Thesis, Mechanical Engineering, December 2002.

Analysis of Pivot-Arm Continuously Variable Transmissions, Myles Christensen, MS Thesis, Mechanical Engineering, April 2002.

An Engineering Approach for Matching Technology to Product Applications, John Larsen, MS Thesis, Mechanical Engineering, December 2001.

Principles for the Design and Development of Modular Consumer-Products, Christopher Mattson, MS Thesis, Mechanical Engineering, August 2001.

High Production Manufacturing Considerations for Metallic Compliant Mechanisms with Long Thin Beams, Aaron Herring, MS Thesis, Mechanical Engineering, April 2001.

Acrylonitrile-Butadiene-Styrene Resins for Rotational Modeling, David Bedell, MS Thesis, Mechanical Engineering, December 2000.

A Designer-Oriented Architecture for Integrating DFA Analysis into the Design Process, Peter Larsen, MS Thesis, Mechanical Engineering, August 2000.

Characterizing Learning Prototype Factors Within the Early Stages of the Product Development Process, David Bent, MS Thesis, Mechanical Engineering, April 1999.

A Methodology for the Evaluation and Selection of Acceptable Design Concept Alternatives for Compliant Mechanisms, Michael Berglund, MS Thesis, Mechanical Engineering, December 1998.

The Development of a 3D Input Device for CAD with Dynamic Cursor Representations, Todd Coons, MS Thesis, Mechanical Engineering, December 1998.

Automatic Vision-Based Identification and Location Estimation of Passive Targets in Ambient Lighting Conditions, Allen Graff, MS Thesis, Mechanical Engineering, December 1998.

A Virtual Environment Computer-Aided Engineering Design Testbed for the Exploration of New CAD User Interfaces, Brian Hayden, MS Thesis, Mechanical Engineering, August 1998.

Key Indicators of Successful Interdisciplinary Engineering Design Teams, Dorothy Taylor, MS Thesis, Mechanical Engineering, December 1997.

Identifying Critical Part Dimensions for Tolerance Analysis Using Constrained CAD Models, Ryan Warnick, MS Thesis, Mechanical Engineering, December 1997.

Characterizing Projects to Improve Team Formation and Resource Allocation in Product Development, Terri Bateman, MS Thesis, Mechanical Engineering, April 1995.

CAD-Based Algorithm for Automation Diffusion of Design-for-Assembly (DFA) Analysis, Avihu Goral, MS Thesis, Mechanical Engineering, April 1995.

A Foundation for Implementation of a Virtual Reality-Augmented Human Computer Interface for CAD, Wade Riser, MS Thesis, Mechanical Engineering, April 1995.

Factors Affecting the Successful Implementation and Performance of Engineering Design Teams, Bret R. Swan, MS Manufacturing Engineering, August 1995.

Dataglove with Virtual Reality: A New Interface Paradigm for Computer-Aided Engineering Design, Hao Zhou, MS Thesis, Mechanical Engineering, April 1995.

Development of an Introductory Descriptive Model for Understanding Concurrent Engineering During Conceptual Design, Delmar A. Eldredge, MS Thesis, Mechanical Engineering, August 1994.

Symmetry Algorithms for Automatic DFA Analysis from a CAD Solid Model, Potdar Nitin Goroba, MS Thesis, Computer Integrated Manufacturing, April 1994.

Concurrent Product and Process Development Team Formation, Dustin Dunn, MS Thesis, Manufacturing Engineering, December, 1993.

A Standardized Approach to Developing Application Programs for Geometric Modelers, David B. Jackson, MS Thesis, Mechanical Engineering, Brigham Young University, December 1992.

A Method of Integrating Multiple Engineering Applications Using Interprocess Communication, Kenneth Gunn, MS Thesis, Mechanical Engineering, September 1992.

Commonalities for Feature Modeling Application Interface Specification, Feyun Zhang, MS Thesis, Mechanical Engineering, Brigham Young University, August 1992.

Feature Mapping: Transferring Between Design and Machining Form Feature Sets, Richard Bean, MS Thesis, Computer Integrated Manufacturing, Brigham Young University, August 1992.

A Functional Design of an Electronic Shop Floor Traveler, L. Chris Anderson, MS Thesis, Computer Integrated Manufacturing, April 1992.

Glove Input Device as a Design Tool in Computer-Aided Design Systems, Ron Goodson, MS Thesis, Computer Integrated Manufacturing, Brigham Young University, July 1992.

Design Rules from Manufacturing Features in Computer-Aided Design, Kelly A. Harward, MS Thesis, Computer Integrated Manufacturing, Brigham Young University, November 1991.

Implementing an Application Interface Specification for Geometric Modelers Using Interprocess Communication, David C. Richardson, MS Thesis, Mechanical Engineering, Brigham Young University, September 1991.

Development of an Automated Design Identification System, James B. Doxey, MS Thesis, Computer Integrated Manufacturing, Brigham Young University, March 1991.

Capstone Design Projects Coached

Note that coaches are responsible for overall guidance and learning of the student design team, and successful completion of the project. Each team involved five to six senior students that works for 8 months. Projects were completed for an industrial sponsor that has supplied the Program with a significant grant for each project. The sponsor is listed first followed by the project title and description.

MegaStir/BYU Friction Stir Welding Group. "Trade Show Friction Stir Welding Machine", Designing and building a portable friction stir welding machine. The machine will be taken to trade shows to showcase the friction stir welding process on steel pipe and place. Completed April 2004.

Mity Lite Inc, "Compliant, Bi-Stable Table Leg Locking Mechanism", Design of a new and easily manufacturable locking mechanism for folding tables that has fewer (or no) pin joints and exhibits bi-stable behaviors. Completed April 2003.

Ford Motor Company, "Retrofit Steering Column Collapse Mechanism", Design and testing of a mechanical system for controlled and adaptable collapse of a steering column that can be retrofitted on current column designs. Completed April 2003.

Parker Hannifin, "Automatic Cutting and Deburring of Wear Rings", Design and fabrication of a machine that will enhance the cutting and deburring processes for wear ring production. Completed June 2002. Parker invested about $25,000 in hardware for the machine.

Cheney Family Enterprises, "Mountain Bike to Snow Bike Conversion". Design and testing of a prototype conversion kit for a mountain bike that would allow it to travel on snow-packed roads and trails. Completed May 2001. Patent pending.

Ford Motor Company, "Improving the Fuel Efficiency of the Ford Excursion Transfer Case". Development of re-design ideas and new operating conditions that could decrease the parasitic losses in the Excursion transfer case. Completed April 2001.

BYU Department of Mechanical Engineering, "Conceptual Studies of Hybrid Human-Powered Vehicles". Design and testing of a lightweight, covered, hybrid vehicle powered by a combination of electric motors and human pedal power. This team worked on the frame and the body of the vehicle. Completed April 2000.

OK Manufacturing, *Design of an Innovative and Entertaining Gum Ball Machine*. This machine that used new approaches to manufacturing of the tracks, and incorporated modular design to realize a new product. Completed May 1995.

K-Tec, *Design of an Improved Juicing Attachment for the Elite Mixer*. The resulting design and prototype were delivered to K-Tec for testing and eventually implemented. Completed May 1994.

Utah Medical Products Company, *Design and Manufacture of an Automated Valve Testing Machine*. The testing machine developed for Utah Medical used unique technologies and won a national award. Utah Medical supplied an additional $16,000, beyond the normal $15,000 Capstone grant to build the machine. Completed February 1994.

Pacific Gas and Electric, *In-Situ Pipe Liner Adhesive Application System.* This project involved the conceptualization, design and testing of a highly constrained adhesive applicator system. The results of the project were used by PG&E to develop a comprehensive program for pipe liners. Completed May 1993.

Whitehall Development Company, *Development of Swim Lap Timing Device for Poolside Use*. The timing device design was completed and sent to the sponsor along with a partial prototype.

All materials were considered proprietary so I do not know the status of the design. Completed May 1992.

Boeing Commercial Airplane Company, *Design and Manufacture of a Shear Tie Drilling Machine for the 737*. This machine was part of a new manufacturing process being developed for Boeing aircraft fuselages. The delivered machine was used by Boeing to test their new process. Completed May 1992.

Swan Carpet Cleaning, *Design and Prototype of an Air-Powered Blower Base for Drying Carpet*. The blower base design was a very innovative approach that may be patented. Completed May 1991.

COURSES TAUGHT/DEVELOPED

Major Courses Taught

DET 437 *Computer-Aided Design Software Development*: The DET Program was merged into ME in 1990 requiring that this course be merged into ME.

ME 172 *Computer-Aided Design Software Development*: First ME course for freshmen, CAD and GD&T focus.

ME 372 *Design of Machine Components*: Traditional course with significant lab experiences.

ME 475/476 *Integrated Product and Process Design (Capstone)*: BYU's Capstone sequence. Team taught.

ME 576 *Advanced Design Methods*: Graduate course in principles of early product design.

ME 671 *Advanced Strategies for Product Development*: Graduate course focused on product development stages from concept to final prototype.

MBA 639 *Product Development: Market to Concept*: Team taught with business faculty.

ME 59R *Global Product Development*: Senior and Graduate level course that includes travel to Asia.

New Courses Developed

ME 475/476 *Capstone Course Sequence*: The Capstone Program was developed by a team of three faculty. The Program has received national attention and awards. In the recent ME Department Alumni Survey the course was consistently rated as one of the most valuable. The Program has been refined and improved over a 10 year period.

ME 576/MBA 639/ME 671 *Product Development Course Sequence*: ME 576 was originally developed to provide education on product development suited for graduate students. With the formation of the IPD graduate program the ME 576 content was expanded, and two new courses were developed to replace it: MBA 639 and ME 671. These new courses are the first two of a three-course sequence in the development of engineered products from market studies through to manufacture.

ME 595R *Global Product Development*: This course was developed to explore ways to educate students on the globalization of engineering design and manufacture by providing first-hand experience in Asia and the U.S. Working with another faculty member, we developed curriculum and a set of industrial visits in the U.S. and Asia to support the course objectives. A 16-18 day trip through Asia is the highlight of this course.