Professional Vitae of Burford J. Furman Fall 2012

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SUMMARY OF CAPABILIT IES

I have a strong background in electromechanical design and engineering education with broad skills in mechatronics, machine design, precision machine design, and mechanism design. I have experience with dynamic system analysis, solid modeling, heat transfer modeling, time-dependent flow of material at elevated temperature modeling, data acquisition, geometric dimensioning and Tolerancing (GD&T), and tolerance analysis. I also have significant experience with web page design and multimedia. I have excellent oral and written communication skills and enjoy working with people.

ACADEMIC BACKGROUND AND HONORS

1991 Ph.D., Stanford University, Mechanical Engineering.

1982 M.E., University of California, Davis, Mechanical Engineering.

1980 B.S., University of California, Davis, Mechanical Engineering, with High Honors.

Dissertation

"A New, Thermally Controlled, Non-Contact Rotor Balancing Method." This work comprised the design and feasibility demonstration of a new approach for balancing a rotor as it spins without physical contact. The method accomplishes balance correction by means of deformable metallic elements, which relocate discrete masses through local radiative heating under the action of centrifugal forces.

Master's Thesis

"Design of an Improved Rotary Singulator." This work focused on the design of a modular mechanism that improved the versatility of a previously existing singulator (a device that orders objects from a disorganized state). This work resulted in a U.S. patent, no. 4,526,269, on July 2, 1985.

Promoted to Professor, May 2006

SJSU College of Engineering Applied Materials Award for Excellence in Teaching, March, 2001

SJSU ITL 2000-20001 Teacher Scholar

Awarded tenure and promoted to Associate Professor, May 2000

Faculty Merit Increase for demonstrated performance (July 1, 1999 through June 30, 2000), November 20, 2000

ITL-Knight-Ridder Champions Fellowships, 1998

President’s Special Recognition Award (PSRA) for exceptional achievements that

- Director of the DEC Workstation Laboratory, 1995-1996

Visiting Scientist, New Focus, Inc., San José, CA (July 2008 – July 2009) (while on Sabbatical Leave from SJSU)

I worked on the next-generation design of the Picomotor, New Focus' industry leading high precision positioner and related projects. Work areas included:

- Development of design concepts, detail drawings, and finite element analysis for a Picomotor that had faster actuation and higher force output
- Development of a capacitive touch interface to control a Picomotor
- Life testing and analysis of alternative material configurations in the current Picomotor

Consultant, Symyx Technologies, Santa Clara, CA. October 2001 to July 2002 (while on Sabbatical Leave from SJSU)

I assisted research chemists by designing hardware for a catalyst process optimization reactor. Work areas also included:

- Re-design of a compact, pneumatically controlled injection valve for a gas chromatograph (GC)
- Design and testing of alternative o-ring glands for sealing catalyst tubes
- Leak testing reactor hardware

Staff Engineer, IBM Corporation, Advanced Storage and Retrieval Division (ADSTAR), San José, CA. 1991 – 1993.

I was responsible for design, development, and analysis of actuator hardware and spindle motors for high capacity disk drives. Work areas also included:

- Analysis of actuator magnetics
- Testing of spindle motor performance
- Manufacturing process improvement
- Field failure analysis
- Serving as a technical liaison for IBM-sponsored student engineering projects at San José State University
- Exploration of new business opportunities for the ADSTAR division

Research and Teaching Assistant, Stanford University, Mechanical Engineering Department, Stanford, CA. 1986 – 1991.

My research focused on the development and feasibility demonstration of a new method of non-contact rotor balancing. Areas of investigation and accomplishments included:

- The design of a compact, modular el3eo9.96 1(is)]TJ (t) Tm [(M)-1(y r)etr y0lla4(de)4(s)-1(i)-2(gn

I served as a teaching assistant for the Master's Project Course in Design (ME 210). Responsibilities included preparing course materials, instructing, grading, and establishing and maintaining the course's laboratory.

Senior Associate Engineer, IBM Corporation, General Products Division, San José, CA. 1982–1986.

I was part of a new product development team responsible for the design and development of the IBM 3390 Magnetic Disk Storage Device. Significant accomplishments were:

- The development of a novel vibration isolator used in a compact voice-coil actuator (subsequently patented, US Patent No. 4,730,227, March 8,Tc

Dr. Tai-Ran Hsu, Professor, Mechanical and Aerospace Engineering, San José State University
Dr. John Lee, Assistant Professor, Mechanical and Aerospace Engineering, San José State

F. Gagliardi, “Development of a Fixture to Perform Confined Creep Experiments on Composite Materials”, May 2007

O. Hui, “Active Force Control for Stylus Profiler”, May 2007

N. Hughes, “Orthogonal Blade Flexures: Study of Axial Stiffness for Flexures Used in Kinematic Coupling”, December 2006

S. Tiscareno, “Micro Metrology Station for MEMS Inspection”, May 2006

L. Nicoli, “Laboratory Experiments for Precision Machine Design”, May 2006

B. Biggs, “Mass Properties Using Statistical Techniques”, May 2005

L. Leninger, “Design and Analysis of Antenna Hinge”, December 2004

J. Dare, “Design of a Myoelectric Signal Detection System and Digital Filter Based on Wavelet Transform,” December 2004

K. Joshi, “Probe System for Stylus Profilometer,” May 2004

J. Carandang, “Hardware and Software Interface for a Coordinate Measuring Machine,” May

M. Kearny, “Electrostatically Actuated Stylus Profilometer With Capacitive Displacement Sensing in Vertical and Lateral Directions,” August 1998

A. Khan, “Stamping Die Punch Wear Detector,” June 1998

S. Pang, “Single Axis Laser Interferometer,” May 1998

H. Zheng, “Cantilever Attachment Scheme for Atomic Force Microscope,” May 1998

M. Phul, “Determination of the Effects of Design Parameters on the Contact Pressure at the Clamp Interface of a Flexural Bearing,” December 1997

M. Abushaban, “Design of a Belted CMP Machine,” December 1996 ***

G. Chin, “Optimization and Life Testing of Shape Memory Alloy Wire Actuators for Refreshable Braille Display,” December 1996

J. Gonzalez, “Evaluation of Methods for Terminating Memory Alloy Wires for Force Actuators,” December 1996

D. Plankenhorn, “Leadership and Methodological Practices for New Product Development by Multidisciplinary Teams”, May 1996 *

S. Ahmed, “Design of a Low-Cost Mechanical Breadboarding Kit For the Effective Teaching of Mechanism Design,” February 1996

J. Nguyen, “Design of a Pressure Sensing Canula,” January 1996

D. Rossman, “Self-Aligning Spatial Filter,” May 1996 *

A. Ciasci, “Method of Development for the Analysis of Thermally Controlled Plastic Deformation of 304 Stainless Steel,” December 1995

H. Saravia, “Design of a Disposable Irrigation Pump,” March 1995

* Reading Committee member
** This work resulted in a provisional patent
*** This work resulted in a US patent

INVITED LECTURES

“A New, Thermally Controlled, Non-Contact Rotor Balancing Method,” Santa Clara University Mechanical Engineering Department Winter Seminar Series, January 12, 1994.

PATENTS AND INVENTION DISCLOSURES

"Apparatus and Method for Polishing a Flat Surface Using a Belted Polishing Pad," US patent 6,146,249, November 14, 2000, with co-inventors, A. Hu and M. Abushaban.

"Adjustable Fixture for Thermal Testing of Fan Heat Sinks," invention disclosure and provisional patent application, with co-inventors, M. Willink and Tomas Schindler, May 8, 2000.

"Apparatus and Method for Polishing a Flat Surface Using a Belted Polishing Pad," US patent No. 6,059,643, May 9, 2000, with co-inventors, A. Hu and M. Abushaban.

"Automated Glass Scribing Device," invention disclosure, September 9, 1995, with co-inventors, A. Devey, P. D. Jequinto, K. Lim, and D. Seawright.

"Disk File Actuator With Combined Carriage Rail and Isolator Mount For Drive Magnet," US Pat. No. 4,730,227, March 8, 1988, with co-inventors, D. G. Chong, E. L. Mathurin, and T. J. Rajac.

"Singulator," US Pat. No. 4,526,269, July 2, 1985, with co-inventor J. M. Henderson.

LIST OF PUBLICATIONS

Furman, B.; Wertz, E.; , "A First Course In Computer Programming for Mechanical Engineers," Mechatronics and Embedded Systems and Applications (MESA), 2010 IEEE/ASME International Conference on , vol., no., pp.70-75, 15-17 July 2010

Furman, B. J., Moen, E., "Evaluation of Alternative Microcontrollers for Mechatronics Education," Computers in Engineering Education Journal, vol. 15, no. 3, July-September 2005.

Du, W. Y., Furman, B. J., Mourtos, N. J., "On the Ability to Design Engineering Experiments, Proceedings of the 8th UICEE Annual Conference on Engineering Education, February 2005.

Furman, B. J., Robinson, "Improving Engineering Report Writing with Calibrated Peer Review," Proceedings of the 2003 Frontiers in Education Conference, November 2003.

Mourtos, N. J., Furman, B. J., "Assessing the Effectiveness of an Introductory Engineering Course for Freshman," Proceedings of the 2002 Frontiers in Education Conference, November 6-9, 2002, Boston, MA.

Furman, B. J., Hayward, G. P., "Asynchronous Hands-On Experiments for Mechatronics Education," Mechatronics, vol. 12, 2002, pp. 251-260.

Taylor, M. T., Belgrader, P., Furman, B. J., Pourahmadi, F., Kovacs, G. T. A., Northrup, M. A., "Lysing Bacterial Spores by Sonication through a Flexible Interface in a Microfluidic System," Analytical Chemistry, vol. 73, no. 3, February 1, 2001, pp. 492-496.

Furman, B. J., Hayward, G. P., "Asynchronous Hands-On Experiments for Mechatronics Education, Proceedings of the 7th Mechatronics Forum International Conference, Atlanta, GA, September 6-8, 2000.

Hayward, G. P., Furman, B. J., "Teaching Mechatronics to the New Generation," 1999 ASME International Mechanical Engineering Congress and Exposition, Nashville, TN, November 1999.

Furman, B. J., "Printer Carriage Motion Control Experiment," Electronics Technology Journal vol. 3, no. 2, Fall, 1998, pp. 22-23.

Furman, B. J., Hsu, P., Johnson, P., “ME 106 Foundations in Mechatronics Laboratory Manual,” Mechanical and Aerospace Engineering Department, Spring 1998 to Spring 2000.