

Curriculum Vita
William J. Endres, Ph.D.

Home Address:

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Citizenship

U.S. Citizen

Education

- **Ph.D. Mechanical Engineering, University of Illinois at Urbana-Champaign, Oct. 1992.**
Attended Jan. 1990 – Sep. 1992
Thesis: “A Dual-Mechanism Approach to the Prediction of Machining Forces for Metal-Cutting Processes”
Co-Directors of Dissertation Research: Professors Richard E. DeVor and Shiv G. Kapoor
- **M.S. Mechanical Engineering, University of Illinois at Urbana-Champaign, Jan. 1990.**
Attended Aug. 1988 – Dec. 1989
Thesis: “A Dynamic Model of the Cutting Force System in the Turning Process”
Advisors: Professors Richard E. DeVor, Shiv G. Kapoor, and John W. Sutherland
- **B.S. Mechanical Engineering, University of Illinois at Urbana-Champaign, May 1988.**
Attended Aug. 1984 – May 1988

Employment History

Endres Machining Innovations, LLC, Houghton, MI

- **Founder and President: Dec. 2004 – Date.**
EMI provides a variety of innovative engineering services that tailor our expertise to the differing needs of both OEMs and small- to medium-sized suppliers. EMI’s revolutionary technologies and services, including knowledge-transfer, application development, and machinability testing services, support a customer’s efforts to reduce cost, improve quality, and reduce time to market for its machined products. EMI’s industry-leading R&D efforts aim to commercialize machining process and tooling technologies that provide end-users with *substantial* efficiency improvements. EMI’s focus is the machining of difficult-to-machine materials, such as titanium, nickel alloys, stainless steels, compacted-graphite iron (CGI), hardened steel, and metal-matrix composites (MMCs). We are now extending our expertise to other challenging materials and applications involving fiber reinforced polymers, de-scaling of cooled or hot, just-cast billets, consistent/universal chip breaking in profile turning, energy efficient chipping and chopping of cellulosic biomass, and mass manufacturing of fuel cell components and hydrogen/gaseous storage tanks.

Dept. of Mechanical Engg. – Engg. Mechanics, Michigan Technological University, Houghton, MI

- **Associate Professor: May 2001 – Date.**
Research: Funded research in cutting mechanics for metals and ceramics, analytical and computational machining dynamics in single and parallel-process machining, machine-tool joint dynamics, and mechanistic process modeling techniques.
Teaching: Course development and instruction in machining dynamics and mechanics, machining process modeling, mechanical design and manufacturing, and dynamic systems. Advising undergraduate independent study projects and mentoring Doctoral and Masters students.
- **Director, Senior Capstone Design Program: May 2009 – Date.**
The SCD Program each year involves 180+ students working on teams of 3-6 for approximately 36 two-semester projects. Projects are primarily industry sponsored providing a fully externally funded operating budget of about \$500,000 per year. As the first Program Director, responsibilities include program leadership with input from an advisory committee; oversight and management of program-

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related staff, advising matters, and financial matters; academic operations including student logistics, grade management, and ABET data compilation and management.

Research and New Product Development, Lamb Technicon Machining Systems, Warren, MI

- Visiting Researcher: May 2001 – Aug 2001.
Applied past research results to their new flexible line boring machine (the BOA – Boring with Optimal Accuracy) and its laser-guided, piezo-actuated smart tool for (1) better understanding of its stability (2) development of a pitch error compensation algorithm and calibration tool.

Dept. of Mechanical Engineering, University of Michigan, Ann Arbor, MI

- Assistant Professor: Sep. 1994 – May 2001.
Research: Same as above.
Teaching: Same as above.
- Visiting Assistant Professor: Feb. 1994 – Aug. 1994.
Research: Funded research in sheet metal stamping and un-funded research in cutting mechanics and mechanistic process modeling techniques.
Teaching: Development of a hands-on course in mechanical design and manufacturing.

Dept. of Mech. and Ind. Engineering, University of Illinois at Urbana-Champaign, Urbana, IL

- Visiting Assistant Professor: Sep. 1992 – Jan. 1994.
Research: Research in cutting mechanics and mechanistic process modeling techniques.
Teaching: Course development and instruction in dynamic systems, manufacturing processes and mechanical design. Advising Masters students in the Manufacturing Systems Research Group.
- Graduate Research Assistant: Aug. 1988 – Sep. 1992.
Research: Research in cutting mechanics, computational machining dynamics, and mechanistic process modeling techniques.
Teaching: Primary lecture instructor for one term, via a distinguished Departmental Teaching Fellowship, for a course in “Modeling and Analysis of Dynamic Systems,” and for one-half of a term for a graduate course in “Accuracy, Dynamics, and Control of Machining Systems.”
- Undergraduate Teaching Assistant: Aug. 1987 – May 1988.
Instructor for laboratory sessions, maintaining equipment, and assembling new laboratory equipment for a course in “Microcomputer Control of Mechanical Engineering Systems.”

Process Design and Control, Inc., Champaign, IL

- Independent Contractor to Process Design and Control, Inc.: Feb. 1989 – May 1992.
Engineering consulting in the areas of manufacturing process planning/design; development of machining process models and computer simulation software.

ABB - Impell Corporation, Lincolnshire, IL

- Engineering Intern: Summer 1988, Dec. 1988 – Jan. 1989.
Piping support analyses for nuclear plants; custom FEA front-end software maintenance.

S & C Electric Company, Chicago, IL

- Summer Employee: Summers 1984 – 1987
1984 - 1986: Cleaning machines, stocking inventory, and kitting materials for jobs in the Tool Shop.
1987: Assembly of pad mounted switchgear units.

Board of Directors Membership

Winsert, Inc., Marinette, WI, May 2006 – Feb. 2009

Founded in 1977, Winsert, Inc. is a leading supplier of cast valve seat inserts (VSIs) for the world’s engine market. Winsert utilizes proprietary alloys to create affordable wear solutions for its OEM customers. Since 1992, Winsert has maintained the industry’s most

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sophisticated alloy development and wear-testing capability for the VSI sector. This R&D resource gives Winsert customers a matrix of design and performance options for warranty-critical VSI components. Winsert's patented new high performance, cost-saving alloys allow engine OEMs to meet stricter emission standards and minimize reliance on price-volatile raw materials. The combination of commitment to ISO/TS 16949 and ISO 14001 quality standards and use of advanced alloys allow Winsert to provide zero-defect performance and ready-to-install parts to its global customer base.

Honors and Awards

- Milton C. Shaw Outstanding Young Manufacturing Engineer Award, Society of Manufacturing Engineers, 1999.
- Recognized as an Outstanding Reviewer for the *ASME Journal of Manufacturing Science and Engineering*, 1998.
- National Science Foundation CAREER Award, 1998.
- ASME Blackall Machine Tool and Gage Award, with advisors R. E. DeVor and S. G. Kapoor (based on Ph.D. research), for "the best paper or papers clearly concerned with or related to the design or application of machine tools, gages or dimensional instruments" published in the *ASME Journal of Manufacturing Science and Engineering* (formerly *ASME Journal of Engineering for Industry*), 1997.
- Amoco Foundation Teaching Fellowship (UIUC), 1991.
- University of Illinois at Urbana-Champaign University Fellowship, 1988 – 1990.

Invention Disclosures and Patents

Invention Disclosures

1. Endres, W. J., "Elemental Cavity-based Tooling," MTU 0413.00, Mar. 2004.
2. Endres, W. J., "Internal Micro-Duct Cooled Cutting Tool," MTU 0412.00, Mar. 2004.
3. Endres, W. J., "Pinpoint Thermal Control Element for Elemental Molds and Casting Dies," MTU 0421.00, Apr. 2004.

Patents

Patent Applications Pending – 4

1. Endres, W. J., "System for Improving the Wearability of a Surface and Related Method," EU.
2. Endres, W. J., "High-Pressure, Fluid Storage Tank," EU.
3. Endres, W. J., "Cutting Tool Insert Having Internal Microduct for Coolant," US (and PCT).
4. Endres, W. J., Woodruff, D. J., Loosemore, J. W., and Kumbera, T. G., "Rotary Metal-Cutting Insert and Mounting Cartridge Therefor," US (and PCT).

Patents Issued – 2

1. Endres, W. J., "High-Pressure, Fluid Storage Tank," US 7,479,314 B2, Issued Jan. 20, 2009.
2. Endres, W. J., "System for Improving the Wearability of a Surface and Related Method," US 7,651,758 B2, Issued Jan. 26, 2010.

Publications (Student names underlined)

Peer Reviewed Journal/Transactions Publications

In print or to appear – 22

1. Radulescu, R., Kapoor, S. G., Endres, W. J., and DeVor, R. E., 1993, “An Investigation of the Vibration of the Face Milling Process During High-Speed Machining,” *Trans. of NAMRI/SME*, **21**, 237-246; also presented at NAMRC 21, 1993.
2. Endres, W. J., and Waldorf, D. J., 1994, “The Importance of Size Effect Variation Along the Cutting Edge in Predicting the Effective Lead Angle in Turning,” *Trans. of NAMRI/SME*, **22**, 65-72; also presented at NAMRC 22, 1994.
3. Endres, W. J., DeVor, R. E., and Kapoor, S. G., 1995, “A Dual-Mechanism Approach to the Prediction of Machining Forces: Part 1 – Model Development,” *ASME J. of Engg. for Ind.* (now *ASME J. Mfg. Sci. and Engg.*), **117**, 526-533; also presented at the ASME WAM and in *Proc., Symp. on Modeling, Monitoring and Control Issues in Mach. Processes*, **PED-64**, 563-576, 1993. *Journal version awarded, with Part 2, the 1997 ASME Blackall Machine Tool and Gage Award.*
4. Endres, W. J., DeVor, R. E., and Kapoor, S. G., 1995, “A Dual-Mechanism Approach to the Prediction of Machining Forces: Part 2 – Calibration and Validation,” *ASME J. of Engg. for Ind.* (now *ASME J. Mfg. Sci. and Engg.*), **117**, 534-541; also presented at the ASME WAM and in *Proc., Symp. on Modeling, Monitoring and Control Issues in Mach. Processes*, **PED-64**, 577-593, 1993. *Journal version awarded, with Part 1, the 1997 ASME Blackall Machine Tool and Gage Award.*
5. Endres, W. J., 1996, “A Quantitative Energy-Based Method for Predicting Stability Limit as a Direct Function of Spindle Speed for High-Speed Machining,” *Trans. of NAMRI/SME*, **24**, 27-32; also presented at NAMRC 24, May 1996.
6. Melkote, S. N., and Endres, W. J., 1998, “The Importance of Considering Size Effect when Modeling Slot End Milling,” *ASME J. Mfg. Sci. and Engg.*, **120**, 68-75; also presented at and in *Proc., First S. M. Wu Symp. on Mfg. Sci.*, 399-406, 1994.
7. Chiu, W.-C., Thouless, M. D., and Endres, W. J., 1998, “An Analysis of Chipping in Brittle Materials,” *J. of Fracture*, **90**, 287-298.
8. Manjunathaiah, J., and Endres, W. J., 2000, “A Study of Apparent Negative Rake Angle and its Effects on Shear Angle During Orthogonal Cutting with Edge-Radiused Tools,” *Trans. of NAMRI/SME*, **28**, 197-202; also presented at NAMRC 28, May 2000.
9. Schimmel, R. J., Manjunathaiah, J., and Endres, W. J., 2000, “Edge Radius Variability and Force Measurement Considerations,” *ASME J. Mfg. Sci. Engg.*, **122**, 590-593; also presented at the ASME IMECE and in *Proc., Symp. on Advances in Cutting Tools and Workholding Technology for Machine Tools*, **MED-6-2**, 261-267, 1997.
10. Manjunathaiah, J., and Endres, W. J., 2000, “A New Model and Analysis of Orthogonal Machining with an Edge-Radiused Tool,” *ASME J. Mfg. Sci. and Engg.*, **122**, 384-390; also presented at the ASME IMECE and in *Proc., Symp. on Adv. Matls. Processing*, **MED-8**, 259-268, 1998.
11. Schimmel, R. J., Endres, W. J., and Stevenson, R., 2000, “The Application of an Internally Consistent Material Model to Determine the Effect of Zero Clearance in Orthogonal Machining,” *J. Mach. Sci. and Tech.*, **4**, 101-125.

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12. Chiu, W.-C., Endres, W. J., and Thouless, M. D., 2000, "An Experimental Study of Chip Formation and Surface Formation during Orthogonal Machining of Homogeneous Brittle Materials," *J. Mach. Sci. and Tech.*, **4**, 253-275.
13. Ozdoganlar, O. B., and Endres, W. J., 2000, "An Analytical Representation of Chip Area for Corner-Radiused Tools Under Depth-of-Cut and Feed Variations," *ASME J. Mfg. Sci. and Engg.*, **122**, 660-665; also presented at the ASME IMECE and in *Proc., Symp. on Adv. Matls. Processing*, **MED-8**, 251-258, 1998.
14. Manjunathaiah, J., Beecherl, P. M., Szuba, P. S., and Endres, W. J., 2001, "Model-Based Design of Rotating Insert Tools for Metal Cutting Applications," *Trans. of NAMRI/SME*, **29**, 351-358; also presented at NAMRC 29, May 2001.
15. Chiu, W.-C., Endres, W. J., and Thouless, M. D., 2001, "An Analysis of Surface Cracking during Orthogonal Machining of Glass," *J. Mach. Sci. and Tech.*, **5** 195-215.
16. Schimmel, R. J., Endres, W. J., and Stevenson, R., 2002, "The Application of an Internally Consistent Material Model to Determine the Effect of Tool Edge Geometry in Orthogonal Machining," *ASME J. Mfg. Sci. and Engg.*, **124**, 536-543; also presented at the ASME IMECE and in *Proc., Symp. on Mach. Sci. and Tech.*, **MED-10**, 327-335, 1999.
17. Endres, W. J., and Ozdoganlar, O. B., 2002, "Existence and Effects of Overlap Factors Greater than Unity and Less than Zero," *J. Manuf. Proc.*, **4**, 67-76; also in *Trans. of NAMRI/SME*, **29**, 159-166 and presented at NAMRC 29, May 2001.
18. Endres, W. J., and Kountanya, R. K., 2003, "The Effects of Corner Radius and Edge Radius on Tool Flank Wear," *J. Manuf. Proc.*, **4**, 89-96; also in *Trans. of NAMRI/SME*, **30**, 401-407 and presented at NAMRC 30, May 2002.
19. Li, C.-J., Ulsoy, A. G., and Endres, W. J., 2003, "The Effect of Flexible-Tool Rotation on Regenerative Chatter in Machining," *ASME J. Mfg. Sci. and Engg.*, **125**, 39-47.
20. Corpus, W. T., and Endres, W. J., 2004, "Added Stability Lobes for Machining Processes that Exhibit Periodic Time Variation – Part 1: An Analytical Solution," *ASME J. Mfg. Sci. and Engg.*, 467-474; also presented under different title at the ASME IMECE and in *Proc., Symp. on Machining Processes*, **MED-11**, 871-878, 2000.
21. Corpus, W. T., and Endres, W. J., 2004, "Added Stability Lobes for Machining Processes that Exhibit Periodic Time Variation – Part 2: Experimental Validation," *ASME J. Mfg. Sci. and Engg.*, 475-480.
22. Kountanya, R. K., and Endres, W. J., 2004, "Flank Wear of Edge-Radiused Cutting Tools under Ideal Straight-Edged Orthogonal Conditions," *ASME J. Mfg. Sci. and Engg.*, 496-505; also presented at the ASME IMECE and in *Proc., Symp. on Advances to Further the Automation of Metal Removal Processes*, **CD#3**, Paper # IMECE2002-MED-34100, 2002.

Conference Symposia Publications (not including journal papers cited above that were also presented at conferences, as was noted above.)

1. Endres, W. J., Sutherland, J. W., DeVor, R. E., and Kapoor, S. G., 1990, "A Dynamic Model of the Cutting Force System in the Turning Process," *Proc., Symp. on Monitoring and Cont. for Mfg. Processes*, ASME WAM, **PED-44**, 193-212.

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2. Endres, W. J., Sutherland, J. W., and DeVor, R. E., 1990, "Process Improvement Using a Computer-Based Dynamic Force Model for the Turning Process," *Proc., Sixth Int. Conf. on Computer-Aided Production Engg.*, 29-42.
3. Endres, W. J., 1995, "Approximations for Efficient Analytical Computation of Effective Lead Angle in Mechanistic Turning, Boring, and Face Milling Models," *Tech. Papers. of NAMRI/SME*, **23**, 147-152.
4. Endres, W. J., 1996, "The Effect of Cutting Process Models, Process Gain Selection and Process Nonlinearity on Machining Stability Analysis," *Proc., Symp. on Physics of Mach. Processes – III*, ASME IMECE, 115-127.
5. Manjunathaiah, J., and Endres, W. J., 1996, "Effects of a Honed Cutting Edge in Machining," *Proc., Second S. M. Wu Symp. on Mfg. Sci.*, 25-30.
6. Chiu, W.-C., Endres, W. J., and Thouless, M. D., 1997, "Surface Formation During Rough Machining of Brittle Materials with a Geometrically Defined Tool," *Symp. on Engg. Mechanics in Mfg. Proc. and Mats. Processing*, Joint ASME, ASCE, SES Summer Meeting, Evanston, IL.
7. Endres, W. J., 1997, "An Energy-Based Approach towards Obtaining an Analytical Solution for Chatter Vibration Level," *Tech. Papers of NAMRI/SME*, **25**, 27-32.
8. Ozdoganlar, O. B., and Endres, W. J., 1997, "A Structured Fully-Analytical Approach to Multi-Degree-of-Freedom Time-Invariant Stability Analysis for Machining," *Proc., Symp. on Predictable Modeling in Metal Cutting as Means of Bridging Gap Between Theory and Practice*, ASME IMECE, **MED-6-2**, 153-160.
9. Ozdoganlar, O. B., and Endres, W. J., 1998, "An Analytical Stability Solution for the Turning Process with Depth-Direction Dynamics and Corner-Radiused Tooling," *Proc., Symp. on Advances in Modeling, Monitoring, and Control of Machining Systems*, ASME IMECE, **DSC-64**, 511-518.
10. Li, C.-J., Ulsoy, A. G., and Endres, W. J., 1999, "The Effect of Tool Rotation on Regenerative Chatter in Line Boring," *Proc., Symp. on Dynamics, Acoustics, and Simulations*, ASME IMECE, **DE-98**, 235-243.
11. Ozdoganlar, O. B., and Endres, W. J., 1999, "Parallel-Process (Simultaneous) Machining and its Stability," *Proc., Symp. on Mach. Sci. and Tech.*, ASME IMECE, **MED-10**, 361-368, 1999.
12. Kountanya, R. K., and Endres, W. J., 2001, "A High-Magnification Experimental Study of Orthogonal Cutting with Edge-Radiused Tools," *Proc., Symp. on Fundamental Issues in Machining*, ASME IMECE, **CD#3**, Paper # IMECE2001/MED-23317.
13. Endres, W. J., and Loo, M., 2002, "Modeling Cutting Process Nonlinearity for Stability Analysis — Application to Tooling Selection for Valve-Seat Machining," *5th CIRP Int'l Workshop on Modeling of Machining – Application of Machining Models*, May 2002, 71-82.
14. Corpus, W. T., and Endres, W. J., 2003, "An Analytical Model to Predict Chatter in Multi-Dimensional Periodically Time-Varying Machining Processes," *Proc., Symp. on Accuracy and Stability in Machining*, ASME IMECE, **CD#3**, Paper # IMECE2003-42488.
15. Li, C.-J., Ulsoy, A. G., and Endres, W. J., 2005, "The Effect of Spindle Speed Variation on Chatter Suppression in Rotating-Tool Machining," *Progress on Advanced*

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Manufacture for Micro/Nano Technology 2005, Materials Science Forum, Proc., 2005
Intl. Conf. on Adv. Manuf., Taipei, Taiwan, **505-507** 859-864.

Funded Research

External Awards to Academic Institution (Approx. \$970,390 share of \$1,189,781 total)

- “Research and Curriculum Development in Machining Process Analysis,” SME Education Foundation Grant Program (Research Initiation Grant), Jul. 1996 – Jun. 1997, \$10,000, W. J. Endres (PI).
- “Mechanics-Based Analysis of the Cutting Process and Surface Generation in Hard-Tool Machining,” NSF Unsolicited, Sep. 1995 – Jul. 1999, \$229,431, W. J. Endres (PI, ~\$150,000), M. Thouless, J. Pan and K. Ludema.
- “Mechanics-Based Analysis of the Cutting Process and Surface Generation in Hard-Tool Machining — REU Supplement,” NSF Unsolicited, Sep. 1995 – Aug. 1996, \$10,000, W. J. Endres (PI).
- “Analysis Tools for Parallel-Process Machining — Turning and Boring,” Michigan ERC for Reconfigurable Machining Systems, Sep. 1996 – Apr. 2000, \$165,000, W. J. Endres (PI).
- “Mechanics-Based Analysis of the Cutting Process and Surface Generation in Hard-Tool Machining — REU Supplement,” NSF Unsolicited, Sep. 1996 – Aug. 1997, \$10,000, W. J. Endres (PI).
- “Merging Dynamics and Mechanics for Integrated Machine-Tool, Tooling and Process Analysis,” NSF CAREER Program, Apr. 1998 – Mar. 2003, \$200,000, W. J. Endres (PI).
- “Merging Dynamics and Mechanics for Integrated Machine-Tool, Tooling and Process Analysis,” NSF CAREER Program Industry and Equipment Match, Apr. 1999 – Mar. 2004, \$110,000, W. J. Endres (PI).
- “Modeling of Machine-Tool Joint Dynamics,” Michigan ERC for Reconfigurable Machining Systems, Jan. 1999 – Dec. 2001, Approx. \$120,000, W. J. Endres (PI).
- “Variable Hone Performance on Corner-Radiused Gun Drills,” High-Throughput Hole Making Consortium, National Center for Manufacturing Sciences, Oct. 2000 – Aug. 2001, \$35,000, W. J. Endres (PI).
- “GOALI: Process Modeling and Analysis for “Smart Tool” Redevelopment in Flexible Line Boring,” NSF GOALI Program / Lamb Technicon Machining Systems, May. 2001 – Sep. 2003, \$50,000 / \$16,750, W. J. Endres (PI).
- “Mechanics-Based Design of Metal-Cutting Circular Saws,” Industrial Sponsor (identity confidential), Aug. 2004 – Sep. 2005, \$83,640, W. J. Endres (PI).
- “Acquisition of High Speed Digital Imaging System for Multidisciplinary Research at MTU,” NSF Major Research Instrumentation Program, Aug. 2003 – Aug. 2004, \$149,960, S. L. Post (PI), J. Drelich, W. J. Endres (~\$10,000), I. Miskioglu, E. Nadgorny.

Internal Institutional Awards (Approx. \$68,433 share of \$88,133 total)

- “Cooling of Cutting Tools for Increased Productivity via the Application of Internal and External Micro-Geometric Features — Proof of Concept,” MTU Research Excellence Fund — Research Seed, Mar. 2003 – Jun. 2004, \$38,433, W. J. Endres (PI).

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- “Nationally Visible Infrastructure: Industry-Directed Planning of Centers,” MTU Research Excellence Fund — Infrastructure Enhancement, Jun. 2003 – May 2004, \$15,000, W. W. Predebon (PI), W. J. Endres (~\$5,000), J. K. Gershenson, J. W. Sutherland.
- “Nationally Visible Infrastructure: The MTU Machining Education and Research Laboratories (MERL),” MTU Research Excellence Fund — Infrastructure Enhancement, Jun. 2004 – May 2005, \$34,700, W. W. Predebon (PI), W. W. Predebon (PI), R. M. D’Souza, W. J. Endres (~\$25,000), C. R. Friedrich, M. A. Lacourt, M. H. Miller, D. J. Michalek, J. W. Sutherland.

Government & Related Awards to Endres Machining Innovations, LLC (\$1,041,571 total)

- “SBIR Phase I: Micro-quantity Internal Cooling (MQuIC) of Cutting Tools for Increased Productivity via Micro-ducts,” NSF, Jul. 2005 – Dec. 2005, \$99,875, W. J. Endres (PI).
- “Micro-quantity Internal Cooling (MQuIC) of Cutting Tools for Increased Productivity via Micro-ducts — SBIR Match,” Michigan Economic Development Corp., Jul. 2005 – Dec. 2005, \$14,981, W. J. Endres (PI).
- “SBIR Phase I: Reduced-Friction Cutting Tools for Increased Productivity via Micro-Fluidic Lubrication (MFL),” NSF, Jul. 2005 – Dec. 2005, \$99,795, W. J. Endres (PI).
- “SBIR Phase I: Reduced-Friction Cutting Tools for Increased Productivity via Micro-Fluidic Lubrication (MFL) — SBIR Match,” Michigan Economic Development Corp., Jul. 2005 – Dec. 2005, \$14,969, W. J. Endres (PI).
- “SBIR Phase II: Micro-quantity Internal Cooling (MQuIC) of Cutting Tools for Increased Productivity via Micro-ducts,” NSF, Mar. 2007 – Feb. 2009, \$499,951, W. J. Endres (PI).
- “SBIR Phase II – Research Experiences for Undergraduates Supplement: Micro-quantity Internal Cooling (MQuIC) of Cutting Tools for Increased Productivity via Micro-ducts,” NSF, Mar. 2007 – Feb. 2009, \$6,000, W. J. Endres (PI).
- “SBIR Phase II – Research Experiences for Undergraduates Supplement: Micro-quantity Internal Cooling (MQuIC) of Cutting Tools for Increased Productivity via Micro-ducts,” NSF, Mar. 2008 – Feb. 2009, \$6,000, W. J. Endres (PI).
- “SBIR Phase I: Cost- and Energy-Efficient Conversion of Cellulosic Biomass to Bio-Fuel Feedstock of Consistent and Preferred Geometry,” NSF, Jan. 2009 – Jun. 2009, \$100,000, W. J. Endres (PI).
- “Cost- and Energy-Efficient Conversion of Cellulosic Biomass to Bio-Fuel Feedstock of Consistent and Preferred Geometry — SBIR Match,” Michigan Economic Development Corp. Emerging Technologies Fund, Jan. 2009 – Dec. 2009, \$25,000, W. J. Endres (PI).
- “SBIR Phase I: Effectively-Thick Coating of High-Wear Surfaces with Application to Cutting Tools,” NSF, Jan. 2010 – Jun. 2010, \$150,000, W. J. Endres (PI).
- “Effectively-Thick Coating of High-Wear Surfaces with Application to Cutting Tools — SBIR Match,” Michigan Economic Development Corp. Emerging Technologies Fund, Jan. 2010 – Dec. 2010, \$25,000, W. J. Endres (PI).

Other Funding

- “Research and Curriculum Development in Machining Process Analysis,” SME Education Foundation Grant Program (software gift), Jul. 1995 – Jun. 1996, \$10,400, W. J. Endres (PD) and D. Dutta.

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- “NIST Summer Research Fellows (SURF) Program,” NIST Summer Undergraduate Research Fellows Program, May 2003 – Aug. 2003, \$6,060, W. J. Endres (PD), J. W. Gillespie (Undergrad recipient).

Graduate Students

Doctoral

- Current (1):
 - Thimmaiah G. Kumbera – expected May 2010, MTU, “Feasibility of a Universal Chip Breaking System.”
- Graduated (7 at UM, 3 at MTU):
 - Jairam Manjunathaiah – Jun. 1998, UM, “Analysis and a New Model for the Orthogonal Machining Process in the Presence of Edge-Radiused (Non-Sharp) Tools;” currently Vice President, General Manager, Infimatic, LLC.
 - Wei-Chong Chiu – May 1999, UM, “Orthogonal Machining of Homogeneous Brittle Materials,” co-chair with Prof. M. D. Thouless; currently with a manufacturing company in Taiwan.
 - Roy J. Schimmel – May 1999, UM, “Analyzing and Modeling the Effects of Tool Edge Geometry in Machining;” currently with General Motors Corp.
 - Chen-Jung Li – Jun. 1999, UM, “Tool-Tip Displacement Measurement, Process Modeling, and Chatter Avoidance in Agile Precision Line Boring,” co-chair with Prof. A. G. Ulsoy; currently a Post-doctoral Research Associate with National Tsing-Hua University.
 - O. Burak Ozdoganlar – Oct. 1999, UM, “Analytical Stability Solutions for Single- and Parallel-Process Turning with Corner-Radiused Tools;” currently Associate Professor, Dept. of Mechanical Engineering, Carnegie Mellon University.
 - William T. Corpus – Feb. 2000, UM, “An Added Stability Phenomenon in Machining Processes with Periodic Time Variation;” currently with Delphi Corp.
 - Raja K. Kountanya – Aug. 2002, UM, “Process Mechanics of Metal Cutting with Edge Radiused and Worn Tools;” currently Machining Applications Engineer, Diamond Innovations, A Sandvik Company.
 - Jiang Zheng – Dec. 2006, MTU, “A Dynamic Model of Joints under Multi-Dimensional Time-Varying Loads;” currently, R&D Engineer, Caterpillar.
 - Samved Bhatnagar – Dec. 2006, MTU, “Feasibility of Micro-Quantity Internal Cooling of Cutting Tools for Enhanced Productivity and Tool Life.”
 - Zhen Zhang – Mar. 2008, MTU, “A Model of Residual Stresses while Machining with Worn Edge-Radiused Tools.”

Master of Science

- Current (0):
- Graduated (4 at UM, 4 at MTU):
 - Raúl Alvarez – May 1996, UM, “Finite Element Modeling for Cutting with an Edge-Honed Tool,” independent study project – non-thesis option.
 - Gustavo Delfino – Dec. 1997, UM, “Meta-modeling of Equivalent Lead Angle for Corner-Radiused Tools,” independent study project – non-thesis option.
 - Scott G. Taylor – Jun. 2000, UM, “Machining Stability with Multi-Dimensional Dynamics and Multi-Tooth, Corner-Radiused Tooling.”
 - Hussein M. Kalaoui – Dec. 2000, UM, “Modeling Dynamic Characteristics of Machine-Tool Joints under Simultaneous Normal and Tangential Loading Conditions.”
 - Mayur P. Shetty – Aug. 2004, MTU, “Experimental Study of Edge-Radius and Wear-Land Effects on Small-Scale Surface Finish.”
 - Rahul N. Gami – Dec. 2004, MTU, “Model-Based Comparative Selection of Optimal Tooling based on Dimensional Accuracy and Wear Rate.”
 - Lenart J. Walqui – Dec. 2005, MTU, “Effects of Chip Splitting Grooves in Metal Cutting Circular Sawing.”
 - Karthik Krishna – Apr. 2006, MTU, “Effects of Tooth Geometry and Materials on Performance of Metal-Cutting Circular Saws.”

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Industry Project Advising, Summer Projects of the Tauber Manufacturing Institute, U. of Michigan

- Sealed Power Div. of SPX Corp., Muskegon, MI — *Cost Reduction and Capital Expenditure Recommendations for Aftermarket Cylinder Liner Business*, 1995; voted best project.
- Ford Motor Co., Advanced Manufacturing Technology Development, Dearborn, MI — *Automated Wet Sanding*, 1996.
- United Defense LP – FMC/BMY, Armament Systems Division (ASD), Minneapolis, MN — *Evaluation of Plating and Heat-Treating Facilities*, 1997.
- Delphi Automotive Systems, Interior and Lighting Systems Div. (Delphi-I), Troy, MI — *Door Latch Commonization*, 1998.
- Ford Motor Co., Dearborn, MI — *Agile Engine Assembly*, 1999.
- Caterpillar China Limited / Caterpillar Xuzhou Limited, Xuzhou, China — *First Operations Supplier Development in China*, 1999.
- A. T. Kearny / Huntsman Packaging Corp., Dalton, GA — *Product Consolidation*, 2000.

Industry Project Advising, Senior Capstone Design Course, Michigan Technological U.

- Ford Motor Co., Dearborn, MI — *Intake Manifold Dynamic Flowbench*, Sep. 2001 – May 2002.
- International Paper Co., WI — *Winder Bering Head Failure and Re-design*, Sep. 2001 – May 2002.
- Boise Paper, MN — *Rollslabbing Tool*, Sep. 2003 – May 2004.
- C. G. Bretting Co., MN — *Log Saw Trim Removal*, Sep. 2003 – May 2004.
- Federal Mogul Corp., MI — *Torsion Vibration Tester*, Sep. 2003 – May 2004.
- Hydro Aluminum, MI — *Universal Machining Fixture*, Sep. 2003 – May 2004.
- Anchor Coupling, MI — *Coupling Capper*, Sep. 2004 – May 2005.
- International Paper Co., MI — *Core Cutter and Air Assist*, Sep. 2004 – May 2005.
- Tyco-Ansul, WI — *CV-98 Valve Actuator Redesign*, Sep. 2004 – May 2005.
- General Motors Corp. / Magna, MI — *Frame Integrated Rear Suspension*, Sep. 2005 – May 2006.
- GHSP, MI — *Driver Interface Control*, Sep. 2005 – May 2006.
- GHSP, MI — *Non-contact Sensor*, Sep. 2005 – May 2006.
- General Motors Corp., MI — *Lift-gate/Swing-gate Hinge*, Sep. 2006 – May 2007.
- GHSP, MI — *Product Innovation Process*, Sep. 2006 – May 2007.
- Winsert, Inc., WI — *Material Handling System – Loading and Transport*, Sep. 2006 – May 2007.
- Winsert, Inc., WI — *Material Handling System – Unloading and Transport*, Sep. 2006 – May 2007.
- Tyco-Ansul, WI — *Valve Manufacturing Cost Reduction*, Jan. 2007 – Dec. 2007.
- HGS Aerospace, MI — *Two-Axis Drill and Fill Head*, Sep. 2007 – May 2008.
- Anchor Coupling, IL — *Hose Assembly Machine*, Sep. 2007 – May 2008.
- HGS Aerospace, MI — *Multi-Axis Head*, Jan. 2008 – Dec. 2008.
- Caterpillar, Inc., IL — *Oil Leak Detection and Quantification*, Sep. 2008 – May 2009.

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- GHSP / KDS Controls, MI — *Automated Vision Maintenance System*, Sep. 2008 – May 2009.
- Continental Teves, Inc., MI — *Rear Backup Collision Avoidance System*, Jan. 2009 – Dec. 2009.
- MB Companies, Inc, WI — *Alternative Snow Removal Brush*, Sep. 2009 – May 2010.

Invited Talks and Seminars

Exploring Future Directions of Machining Process Modeling and its Application

- General Motors Technical Center, Warren, MI, May 1995.
- Ford Scientific Research Laboratories, Dearborn, MI, Mar. 1996.

Finite Element Analysis of Machining with an Edge-Honed Tool

General Motors Technical Center, Warren, MI, Feb. 1996.

Practice-Motivated Research in High-Speed Machining Dynamics

PIM-I/UCRC Joint Manufacturing Seminar Series, University of Michigan, College of Engineering, Ann Arbor, MI, Feb. 1996.

The Mechanics of Cutting Brittle Materials

- Dept. of Mechanical Engineering, University of Kentucky, Lexington, KY, May 2000.
- Dept. of Mechanical Engineering – Engineering Mechanics, Michigan Technological University, Houghton, MI, May 2000.

The Mechanics of Cutting: Brittle versus Ductile Materials

- Dept. of Mechanical Engineering, University of Wisconsin, Madison, WI, Sep. 2000.

The Effects of Edge Hone and other Tool Geometry

- National Center for Manufacturing Sciences (NCMS), Dearborn, MI, Fall Workshop Series, Oct. 2000.

Chatter in Machining — High Speeds and Real Tooling

- United Technologies Research Center, East Hartford, CT, Oct. 2000.
- Dept. of Mechanical Engineering – Engineering Mechanics, Michigan Technological University, Houghton, MI, Graduate Seminar Series, Sep. 2001.

Invited Panelist

- *Impact of Analysis and Understanding of Machining at a Fundamental Level* – with S. Chandrasekar (Purdue U.), I. S. Jawahir (U. Kentucky), T. Marusich (Third Wave Systems, Inc.), and D. Stephenson (General Motors), organized by R. Stevenson (General Motors) and V. Madhavan (Wichita State U.), ASME IMECE, 2001.
- *Dynamic Performance of Machine-Tool Systems* – with Y. Altintas (U. British Columbia), J. E. Halley (Boeing), K. S. Smith (UNC-Charlotte), organized by J. T. Roth (Penn. State U. – Erie) and B. Jokiel (Sandia NL), ASME IMECE, 2002.

Courses Developed and/or Taught

Developed courses are those where substantial original materials have been developed in lieu of a textbook or far beyond the textbook based on an original new syllabus.

Undergraduate, Core and Elective

- ME 313 (UIUC) Microcomputer Control of Mechanical Engineering Systems – Undergraduate TA

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- ME 240 (UIUC) Modeling and Analysis of Dynamic Systems – Amoco Foundation Teaching Fellowship (4 credits)
- ME 270 (UIUC) Analysis and Design of Machines (6 credits)
Part 1: Material Behavior and Mechanics (45 hours of lecture)
Part 2: Machine Component Design (45 hours of lecture)
- ME 285 (UIUC) Manufacturing Processes (3 credits)
- ME 250 (UM) Design and Manufacturing I – 2 of 14 weeks (4 credits), developed
- ME 350 (UM) Design and Manufacturing II (4 credits), developed
- ME 360 (UM) Modeling, Analysis and Control of Dynamic Systems (4 credits)
- ME 482 (UM) Machining Process Modeling (4 credits), developed
- ME 46/5610 (MTU) Advanced Machining Processes (4 credits), similar to ME 482 (UM)
- ME 3501 (MTU) Product Realization I (3 credits), one-half similar to ME 350 (UM)

Graduate

- IE 455 (UIUC) Accuracy, Dynamics, and Control of Machining Systems – 7 of 15 weeks (3 credits), developed
- ME 585 (UM) Machining Dynamics and Mechanics (3 credits), developed
- ME 5990 (MTU) Machining Dynamics, similar to ME 585 (UM)

Short Courses

- *Cutting Tools — Design and Performance Evaluation* – The M. K. Morse Co., Canton, OH, 2 days, Nov. 2004.
- *Static and Dynamic Process Modeling for Machining Performance Analysis* – Northern Research and Engineering Corp., Worcester, MA, 1 day, Apr. 1999.
- *From Cutting Mechanics to New Tooling Concepts* – Vermont American Corp., Louisville, KY, 1 day, Jun. 1995.
- *Machining Process Models for Simultaneous Engineering* – Caterpillar Inc., Mossville, IL, 1 day, Jan. 1993.

Professional Affiliations

- Member, American Society of Mechanical Engineers (ASME) International
- Member, North American Manufacturing Research Institution of the Society of Manufacturing Engineers (NAMRI/SME) and Senior Member, SME
- Member, Tau Beta Pi Engineering Honor Society
- Member, Pi Tau Sigma Mechanical Engineering Honor Society
- Member, Golden Key National Honor Society

Other Professional Activities and Committee Memberships

Institutional Service

- Michigan Technological University
STEP Diversity Committee, Dept. of Mech. Engg. – Engg. Mechanics, Jun. 2008 – Dec. 2009.
M/I Area Director/Dept. Executive Committee, Dept. of Mech. Engg. – Engg. Mechanics, Sep. 2006 – Aug. 2008.
Chair Evaluation Committee, Dept. of Mech. Engg. – Engg. Mechanics, (Chair) Feb. 2005 – Oct. 2006.
Faculty Development (Promotion & Tenure) Committee, Dept. of Mech. Engg. – Engg. Mechanics, Jun. 2004 – May 2007.

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Senior Capstone Design Committee, Dept. of Mech. Engg. – Engg. Mechanics, Sep. 2002 – Date; (Co-chair, Sep. 2006 – May 2009; Program Director (first to be appointed to this new position) May 2009 – Date).

Research Scholars Committee, College of Engineering, Jul. 2002 – Dec. 2006.

Workload Committee, Dept. of Mech. Engg. – Engg. Mechanics, Mar. 2002 – Dec. 2003.

M/I Area Faculty Search, Dept. of Mech. Engg. – Engg. Mechanics, Nov. 2001 – Date; (Chair) Aug. 2002 – May 2004.

Graduate Seminar Series Committee, Dept. of Mech. Engg. – Engg. Mechanics, Sep. 2001 – Aug. 2002; (Chair) Sep. 2002 – Aug. 2006.

- **University of Michigan**

Committee on Scholastic Standing, College of Engineering, Jul. 1999 – Jun. 2000.

Honors and Awards Committee, Dept. of Mechanical Engineering and Applied Mechanics, Apr. 1998 – May 2000.

Undergraduate Program Committee, Dept. of Mechanical Engineering and Applied Mechanics, Apr. 1998 – May 2000.

ME Program Advisor, Joint Degree in Mechanical Engineering and Industrial Design, May 1998 – Jun 2000.

Industrial Design Faculty Search Committee, School of Art and Design, Dec. 1998 – May 1999.

Mechanical Engineering and Applied Mechanics Departmental Review Committee, College of Engineering, Jan. 1998 – Jun. 1998.

External Service

- **Editorships and Regular Reviewing**

Associate Editor, *ASME J. Manufacturing Science and Engineering*, 2004 – 2008.

Associate Editor, *J. Machining Science and Technology*, 2002 – 2005.

Member, Scientific Committee, North American manufacturing Research Institution of SME (NAMRI/SME), 1998 – Date.

Reviewer for the *Int. J. of Machine Tools and Manufacture*.

Reviewer for *ASME J. of Mfg. Sci. Engg.* (previously *J. of Engineering for Industry*).

Reviewer for the *SME J. of Manufacturing Processes*.

Reviewer for the *J. of Machining Science and Technology*.

Reviewer for ASME IMECE conference symposia.

- **American Society of Mechanical Engineers (ASME International)**

Co-organizer (with V. Chandrasekharan, Caterpillar Inc.), ASME Symp. on “Quality of Traditionally Machined Surfaces — Modeling, Analysis and Measurement,” ASME IMECE, 1997.

Co-organizer (with G. Subhash, Michigan Technological University), two sessions on Metal Cutting Processes in the Symp. on “Engineering Mechanics in Manufacturing Processes and Materials Processing” Joint ASME, ASCE, SES Summer Meeting, 1997.

Co-organizer (with S. Chatterjee, Lucent Technologies), ASME Symp. on “Reconfigurable Products, Services and Manufacturing,” ASME IMECE, 1998.

Congress Group Representative (Manufacturing Technical Group), ASME IMECE, 1998 – 2002.

Organizer, congress-wide highlight session on “Improved Productivity through Reconfigurable Manufacturing Systems,” ASME IMECE, 1999.

Program Chair (2003); Co-Chair (2002), Manufacturing Engineering Div., ASME Intl. Mechanical Engineering Congress and Exposition (IMECE), 2001 – 2003.

Organizer, “Fostering Collaboration between Academia and Industry,” a casual, organized time to get to know each other and exchange problems and ideas for their solution, IMECE 2002.

Session Chair/Co-Chair, ASME IMECE, 1995 – Date.

Occasional reviewer for *ASME J. of Dynamic Systems, Measurement and Control*.

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- North American Manufacturing Research Institution of the Society of Manufacturing Engineers (NAMRI/SME)
 - Member, Organizing Committee, Twenty-Fourth North American Manufacturing Research Conference (NAMRC), May 1996, Ann Arbor, MI.
 - Session Chair/Co-Chair (occasional), NAMRC, 1994 – 2005.
- Society of Manufacturing Engineers (SME)
 - Faculty Advisor for U. of Michigan student Chapter 001 of SME, 1995 – 1998.
- National Science Foundation
 - Unsolicited proposal review panel, Nov. 2006.
 - Major Research Instrumentation Program & Unsolicited proposal review panel, Apr. 2005.
 - Unsolicited proposal review panel, Apr. 2001.
 - SBIR/STTR Phase-I proposal review panel, Sep. 2000.
 - Unsolicited proposal review panel, May 1997.

Miscellaneous

- Prior to establishing Endres Machining Innovations, LLC, I had provided short-term (typically 10-30 hours each) consultation services to the following companies:
 - Autodie International, Grand Rapids, MI
 - Ford Motor Company, AMTD, Detroit, MI
 - Caterpillar Inc., Mossville, IL
 - Exxon Chemical Corp., Polymers Applications, Lake Zurich, IL
 - Lamb Technicon Machining Systems, Warren, MI
 - Vermont American Corp., Louisville, KY
- Expert Witness Engagements
 - Liblang and Associates, Birmingham, MI, 2005 – 2006
 - Barnes, Richardson and Colburn, Chicago, IL, 1998

Computer Background

- Fluent in Microsoft Visual Basic for Applications
- Fluent in ANSI Standard C++ and object model development.
- Proficient with Windows® NT/2000/XP operating systems.
- Proficient with Pro/ENGINEER® Wildfire 3.0 Parametric Feature-Based Solids Modeler.
- Past Experience with Borland C++Builder Rapid Application Development tool for Windows® 95/98/NT/2000/XP.
- Past experience with UNIX and the following UNIX workstation-based software packages:
 - I-DEAS™ Object-Based Solids Modeler and Finite Element Modeler/Solver by Structural Dynamics Research Corporation (SDRC).
 - ABAQUS® Finite Element Modeler and Solver.