

Curriculum Vitae

Name: Albert J. Shih

Family: Married to Alice Chang, Four Children: Arthur, Brena, Christopher, Deanna Shih

Degrees

Ph.D., Purdue University, West Lafayette, Indiana (1991)
M.S., Mechanical Engineering, National Cheng Kung University, Tainan, Taiwan (1986)
B.S., Mechanical Engineering, National Cheng Kung University, Tainan, Taiwan (1984)

Positions

10/2007–date: Associate Director, Medical Innovation Center, Univ. of Michigan Ann Arbor, Michigan.
1/2008–date: Co-Director, Wu Manufacturing Research Center, Univ. of Michigan, Ann Arbor, Michigan.
2/2007–date: Professor, Biomedical Engineering, University of Michigan, Ann Arbor, Michigan.
8/2006–date: Professor, Mechanical Engineering, University of Michigan, Ann Arbor, Michigan.
6/2006–1/2008: Deputy Director, Wu Manufacturing Research Center, Univ. of Michigan, Ann Arbor, Michigan.
1/2003–8/2006: Associate Professor, Mechanical Engineering, University of Michigan, Ann Arbor, Michigan.
8/1998–12/2002: Associate Professor, Department of Mechanical and Aerospace Engineering, North Carolina State University, Raleigh, North Carolina.
6/1991–8/1998: Cummins Inc., Columbus, Indiana. Senior Engineer, Process Engineering Center, Fuel Systems (1991-1995) and Technical Specialist, Cummins Technical Center (1995-1998)
8/1993–5/1995: Adjunct Professor, Indiana University Purdue University Columbus, Columbus, Indiana.
8/1989–6/1991: Graduate Teaching Assistant, Purdue University, West Lafayette, Indiana.
6/1986–6/1991: Graduate Research Assistant, Engineering Research Center for Intelligent Manufacturing Systems, Purdue University, West Lafayette, Indiana.

RESEARCH

Patents and Invention Disclosure

Patent awarded:

1. A.J. Shih and T.M. Yonushonis, “High infeed rate method for grinding ceramic workpiece with silicon carbide grinding wheels”, US Patent Number 6,220,933, Apr. 24, 2001.
2. A.J. Shih, M.B. Grant and T.M. Yonushonis, “Constant force truing and dressing apparatus and method,” US Patent Number 6,113,474, Sep. 5, 2000.
3. A.J. Shih and T.M. Yonushonis, “High infeed rate method for grinding ceramic workpiece with silicon carbide grinding wheels” US Patent Number 6,030,277, Feb. 29, 2000.
4. A.J. Shih, “Centerless Grinding Machine with Optimal Regulating Wheel Truing and Dressing,” US Patent Number 5,928,065, July 27, 1999.
5. A.J. Shih, E.J. Cookson “Active Filtration of Airborne Biological and Chemical Agents and Diesel Particulates using Heated Porous Foam Filters,” 7,083,663, Aug 1, 2006.

Pending:

- “Surgical Instrument and Method for Use Thereof,” A.J. Shih, J.D. Geiger, A. Advincular, W. Roberts, Dodde, R. and K. Pipe (submitted, Jan 2007, UM File No. 3137)
- “Two-Stage Hydraulic Regenerative Braking for a Bike,” D. Swain, A.J. Shih, F. Mauer, J. Moore (submitted, Nov. 2006, UM File: 3252)

Invention disclosures:

- High Efficiency Biopsy System (with Dr. Patrick William McLaughlin and Haojun Zheng, UM File No. 3918) [November 2007] (Tech Transfer Representative -- David Ritchie)
- Pathology Sample Management System (with Drs. Jeffrey Myers, Peter Lucas, and Scott Miller, UM File 3745) [May 2007]
- Injection Device for Prostate Seed Implants (with Dr. Patrick William McLaughlin, UM File No. 3700) [March 2007]

- Multi-Biopsy Needle for Prostate Cancer (with Dr. Patrick William McLaughlin, UM File No. 3691) [March 2007]
- Trocar Improvements - Anchoring System, Adjustability, Improved Seal Design (with Dr. James Geiger, UM File No. 3497) [April 2006]
- Adapted power mobility units for patient transportation: portable fuel cell/adapted battery units (with Dr. Patrick Brophy of UM Medical Center, UM File No. 3124) [April 2005]
- Laparoscopic Surgical Instrument for Use in Pyloromyotomies (UM File No. 3052) [February 2005]
- Pre-turbocharging Catalyzed Porous Metal Foam Filter for Diesel Particulates Treatment (UM File No. 2924) [October 2004]

Publications

Refereed Journal Papers:

1. B. Shen, G. Xiao, C. Guo, S. Malkin, A. J. Shih "Thermocouple Fixturing Method for Grinding Temperature Measurement," *ASME Journal of Manufacturing Science and Engineering*, in press.
2. C. C. Kao, A. J. Shih, S. F. Miller "Fuzzy Logic Control of Micro-Hole Electrical Discharge Machining," *ASME Journal of Manufacturing Science and Engineering*, in press.
3. J. Zhu, J. Ni, A. J. Shih "Robust Machine Tool Thermal Error Modeling through Thermal Modal Analysis," *ASME Journal of Manufacturing Science and Engineering*, in press.
4. S. Arul, G. H. Kruger, S. F. Miller, P. K. Mallick, T. Y. Pan, A. J. Shih "An Experimental Study of Joint Performance in Spot Friction Welding of 6111-T4 Aluminum Alloy," *Science and Technology of Welding and Joining*, in press.
5. D. Mei, T. Kong, A. J. Shih, Z. Chen "Magnetorheological Fluid Controlled Boring Bar for Chatter Suppression," *Journal of Material Processing Technology*, in press.
6. Y. Y. Zhou, G. S. Lin, A. J. Shih, S. J. Hu "Multi-Physics Modeling of Assembly Pressure Effects on PEM Fuel Cell Performance," *ASME Journal of Fuel Cell Science and Technology*, in press.
7. B. Shen, A. J. Shih, S. Tung "Application of Nanofluids in Minimum Quantity Lubrication Grinding," *STLE Tribology Transactions*, in press.
8. Z. Huang, A. J. Shih, J. Ni (2008) "Quantitative Evaluation of Powder Spray Effects on Stereovision Measurements," *Measurement Science and Technology*, Vol. 19, Feb. pp. 025502-1-11.
9. B. Shen, P. Kalita, A. P. Malshe, A. J. Shih (2008) "Performance and Behavior of Novel MoS₂ Nanoparticles based Grinding Fluids in Minimum Quantity Lubrication Grinding," *Transactions of NAMRI/SME*, Vol. 36, pp. 357-364.
10. E. C. Johnson, R. Li, A. J. Shih, H. Hanna (2008) "Design of Experiment Based Force Modeling of the Face Grinding Process," *Transactions of NAMRI/SME*, Vol. 36, pp. 241-248.
11. J.H. Chang, H. Hocheng, H.Y. Chang, and A.J. Shih (2008) "Metal Removal Rate of Thiobacillus Thiooxidans without Pre-secreted Metabolite," *Journal of Materials Processing Technology*, Vol. 201/1-3, pp. 560-564.
12. R. E. Dodde, S. F. Miller, J. D. Geiger, A. J. Shih (2008) "Thermal-Electric Finite Element Analysis and Experimental Validation of Bipolar Electrosurgical Cautery," *ASME Journal of Manufacturing Science and Engineering*, Vol. 130, pp. 021015-1-8.
13. A. J. Shih (2008) "Biomedical Manufacturing – A New Frontier of Manufacturing Research," *ASME Journal of Manufacturing Science and Engineering*, Vol. 130, pp. 021009-1-8.
14. J. Tao, A. J. Shih, J. Ni (2008) "Experimental Study of the Dry and Near-Dry Electrical Discharge Milling Processes," *ASME Journal of Manufacturing Science and Engineering*, Vol. 130, pp. 011002-1-9.
15. J. Tao, A. J. Shih, J. Ni (2008) "Near-Dry EDM Milling of Mirror-Like Surface Finish," *International Journal of Electrical Machining*, No. 13, pp. 29-34.
16. J. Z. Moore, R. J. Somoza, A. J. Shih, Z. Filipi, A. J. Moskalik, N. M. Johnson (2008) "Characterization of the Fluid Deaeration Device for a Hydraulic Hybrid Vehicle System," *SAE Transactions*, Paper #2008-01-0308.
17. Z. Parlar, M. Bakkal, A. J. Shih (2008) "Sliding Tribological Characteristics of Zr-based Bulk Metallic Glass," *Intermetallics*, Vol. 16, pp. 34-41.
18. R. Li, L. Riester, T. R. Watkins, P. J. Blau, A. J. Shih (2008) "Metallurgical Analysis and Nanoindentation Characterization of Ti-6Al-4V Workpiece and Chips in High Throughput Drilling," *Materials Science and Engineering: A*, Vol. 472, pp. 115-124.
19. C. C. Kao, A. J. Shih (2007) "Form Measurements of Micro-Holes," *Measurement Science and Technology*, Vol. 18, pp. 3603-3611.
20. R. Li, A. J. Shih (2007) "High Throughput Drilling of Titanium Alloys," *Chinese Journal of Mechanical Engineering (English Edition)*, Vol. 20, pp. 62-66.

21. C. C. Kao, J. Tao, A. J. Shih (2007) "Near Dry Electrical Discharge Machining," *International Journal of Machine Tools and Manufacture*, Vol. 47, pp. 2273-2281.
22. R. Li, A. J. Shih (2007) "Tool Temperature in Titanium Drilling," *ASME Journal of Manufacturing Science and Engineering*, Vol. 129, pp. 740-749.
23. S. F. Miller, A. J. Shih (2007) "Thermo-Mechanical Finite Element Modeling of the Friction Drilling Process," *ASME Journal of Manufacturing Science and Engineering*, Vol. 129, pp. 531-538.
24. R. Li, A. J. Shih (2007) "Spiral Point Drill Temperature and Stress in High-Throughput Drilling of Titanium," *International Journal of Machine Tools and Manufacture*, Vol. 47, pp. 2005-2017.
25. R. Li, A. J. Shih (2007) "Finite Element Modeling of High-Throughput Drilling of Ti-6Al-4V," *Transactions of NAMRI/SME*, Vol. 35, pp. 73-80.
26. M. W. Chastagner, A. J. Shih (2007) "Abrasive Jet Machining for Edge Generation," *Transactions of NAMRI/SME*, Vol. 35, pp. 359-366.
27. C.-H. Huang, L.-C. Jan, R. Li, A. J. Shih (2007) "A Three-Dimensional Inverse Problem in Estimating the Applied Heat Flux of a Titanium Drilling -- Theoretical and Experimental Studies," *International Journal of Heat and Mass Transfer*, Vol. 50, pp. 3265-3277.
28. S.G. Arul, T. Pan, W.J. Schwartz, A. J. Shih, P.K. Malick, S. F. Miller (2007) "Effects of Surface Treatment (Lubricant) on Spot Friction Welded Joints Made of 6111-T4 Aluminum Sheets," *SAE Transactions*, SAE 2007-01-1706.
29. S.F. Miller, P.J. Blau, A.J. Shih (2007) "Tool Wear in Friction Drilling," *International Journal of Machine Tools and Manufacture*, Vol. 47, pp. 1636-1645.
30. D. J. Johnson, R. Warner, A. J. Shih (2007) "Surface Roughness and Material Removal Rate in Machining Using Microorganisms," *ASME Journal of Manufacturing Science and Engineering*, Vol. 129, pp. 223-227.
31. Y. Y. Zhou, G. S. Lin, A. J. Shih, S. J. Hu (2007) "A Micro-scale Model for Predicting Contact Resistance between Bipolar Plate and Gas Diffusion Layer in PEM Fuel Cells," *Journal of Power Sources*, Vol. 163, pp. 777-783.
32. R. Li, P. Hegde, A. J. Shih (2007) "High Throughput Drilling of Titanium Alloys," *International Journal of Machine Tools and Manufacture*, Vol. 47, pp. 63-74.
33. Z. Huang, A. J. Shih, J. Ni (2006) "Laser Interferometry Hologram Registration for Three-Dimensional Precision Measurements," *ASME Journal of Manufacturing Science and Engineering*, Vol. 128, pp. 1006-1013.
34. A.J. Shih, Z. Huang (2006) "Three Dimensional Optical Measurements of Porous Foams," *ASME Journal of Manufacturing Science and Engineering*, Vol. 128, pp. 951-959.
35. Z. Huang, A. J. Shih, J. Ni (2006) "Phase Unwrapping for Large Depth-of-Field 3D Laser Holographic Interferometry Measurement of Laterally Discontinuous Surfaces," *Measurement Science and Technology*, Vol. 17, pp. 3110-3119.
36. C.C. Kao, A.J. Shih (2006) "Sub-nanosecond Monitoring of Micro-Hole Electrical Discharge Machining Pulses and Modeling of Discharge Ringing," *International Journal of Machine Tools and Manufacture*, Vol. 46, pp. 1996-2008.
37. E.J. Cookson, D.E. Floyd, A.J. Shih (2006) "Design and Analysis of Metal Foam Electrical Resistance Heater," *International Journal of Mechanical Sciences*, Vol. 48, pp. 1314-1322.
38. S.F. Miller, R. Li, H. Wang, A.J. Shih (2006) "Experimental and Numerical Analysis of the Friction Drilling Process," *ASME Journal of Manufacturing Science and Engineering*, Vol. 128, pp. 802-810.
39. S.F. Miller, J. Tao, A.J. Shih (2006) "Friction Drilling of Cast Metals," *International Journal of Machine Tools and Manufacture*, Vol. 46, pp. 1526-1535.
40. R.K. Guduru, K.A. Darling, R.O. Scattergood, C.C. Koch, K.L. Murty, M. Bakkal, A.J. Shih (2006) "Mechanical Properties of a Bulk Metallic Glass Obtained Using Shear Punch Tests," *Intermetallics*, Vol. 14, pp. 1411-1416.
41. C.C. Kao, J. Tao, S. Lee, A.J. Shih (2006) "Dry Wire Electrical Discharge Machining of Thin Workpiece," *Transactions of NAMRI/SME*, Vol. 34, pp. 253-260.
42. R. Li, A.J. Shih (2006) "Finite Element Modeling of 3D Turning of Titanium," *International Journal of Advanced Manufacturing Technology*, Vol. 29, pp. 253-261.
43. L.M. Xu, B. Shen, A. J. Shih (2006) "Vitreous Bond Silicon Carbide Wheel for Grinding of Silicon Nitride," *International Journal of Machine Tools and Manufacture*, Vol. 46, pp. 631-639.
44. J. Luo, H. Ding, A.J. Shih (2005) "Induction-Heated Tool Machining of Elastomers - Part I: Finite Difference Thermal Modeling and Experimental Validation," *Machining Science and Technology*, Vol. 9, pp. 547-565.

45. J. Luo, H. Ding, A.J. Shih (2005) "Induction-Heated Tool Machining of Elastomers - Part II: Chip Morphology, Cutting Forces, and Machined Surfaces," *Machining Science and Technology*, Vol. 9, pp. 567-588.
46. S.F. Miller, P.J. Blau, A.J. Shih (2005) "Microstructural Alterations Associated with Friction Drilling of Steel, Aluminum, and Titanium," *Journal of Materials Engineering and Performance*, Vol. 14, pp. 647-653.
47. S.F. Miller, J. Qu, C.C. Kao, A.J. Shih (2005) "Investigation of Wire Electrical Discharge Machining of Thin Cross-Sections and Compliant Mechanisms," *International Journal of Machine Tools and Manufacture*, Vol. 45, pp. 1717-1725.
48. J. Qu, A. J. Shih, R.O. Scattergood, J. Luo (2005) "Abrasive Micro-Blasting of Surface Layers of Electrical Discharge Machined WC-Co Composite," *Journal of Materials Processing Technology*, Vol. 166, pp. 440-448.
49. R. L. Lemaster, A. J. Shih, Z. Yu (2005) "Blasting and Erosion Wear of Wood using Sodium Bicarbonate and Plastic Media," *Forest Products Journal*, Vol. 55, pp. 59-64.
50. J. Luo, A. J. Shih (2005) "Inverse Heat Transfer Solution of the Induction Heat Flux," *ASME Journal of Manufacturing Science and Engineering*, Vol. 127, pp. 555-563.
51. J. Kong, M. Hendrichsen, A. J. Shih (2005) "Infrared Thermometry Measurement of Temperature Distribution in Microwave Regeneration of Diesel Particulate Filters," *International Journal of Engine Research*, Vol. 6, pp. 61-71.
52. M. Bakkal, S.B. McSpadden, A.J. Shih, R.O. Scattergood (2005) "Light Emission, Chip Morphology, and Burr Formation in Drilling the Bulk Metallic Glass," *International Journal of Machine Tools and Manufacture*, Vol. 45, pp. 741-752.
53. M. Bakkal, S.B. McSpadden, A.J. Shih, R.O. Scattergood (2005) "Thrust Force, Torque, and Tool Wear in Drilling the Bulk Metallic Glass," *International Journal of Machine Tools and Manufacture*, Vol. 45, pp. 863-872.
54. C. W. Hardin, A. J. Shih, R. L. Lemaster (2004) "Diamond Wire Machining of Wood," *Forest Products Journal*, Vol. 54, pp. 50-55.
55. A. J. Shih, R. C. McCall (2004) "Wear and Kinematics of Tool Blades for Scrap Tire Shredding," *Machining Science and Technology*, Vol. 8, pp 193-210.
56. M. Bakkal, A. J. Shih, R. O. Scattergood (2004) "Chip Formation, Cutting Forces, and Tool Wear in Turning of Zr-Based Bulk Metallic Glass," *International Journal of Machine Tools and Manufacture*, Vol. 44, pp. 915-925.
57. C. W. Hardin, J. Qu, A. J. Shih (2004) "Fixed Abrasive Diamond Wire Saw Slicing of Single Crystal SiC Wafers," *Materials and Manufacturing Processes*, Vol. 19, pp. 355-367.
58. J. Kong, A. J. Shih (2004) "Infrared thermometry for diesel exhaust aftertreatment filter temperature measurement," *SAE Transactions*, SAE 2004-01-0962.
59. J. S. Strenkowski, C. C. Hsieh, A. J. Shih (2004) "An Analytical Finite Element Technique for Predicting Thrust Force and Torque in Drilling," *International Journal of Machine Tools and Manufacture*, Vol. 44, pp. 1413-1421.
60. A. J. Shih, M. A. Lewis, J. S. Strenkowski (2004) "End Milling of Elastomers – Fixture Design and Tool Effectiveness for Material Removal," *ASME Journal of Manufacturing Science and Engineering*, Vol. 126, pp. 115-123.
61. A. J. Shih, M. A. Lewis, J. Luo, J. S. Strenkowski (2004) "Chip Morphology and Forces in End Milling of Elastomers," *ASME Journal of Manufacturing Science and Engineering*, Vol. 126, pp. 124-130.
62. S. F. Miller, A. J. Shih, J. Qu (2004) "Investigation of the Spark Cycle on Material Removal Rate in Wire Electrical Discharge Machining," *International Journal of Machine Tools and Manufacture*, Vol. 44, pp. 391-400.
63. M. Bakkal, A. J. Shih, R. O. Scattergood, C. T. Liu (2004) "Machining of a Zr-Ti-Al-Cu-Ni Metallic Glass," *Scripta Materialia*, Vol. 50, pp. 583-588.
64. M. Bakkal, C. T. Liu, T. Watkins, R. O. Scattergood, A. J. Shih (2004) "Oxidation and Crystallization of Zr-Based Bulk Metallic Glass due to Machining," *Intermetallics*, Vol. 12, pp. 195-204.
65. M. G. Garrell, B. M. Ma, A. J. Shih, E. Lara-Curzio, R. O. Scattergood (2003) "Mechanical Properties of PPS Bonded Nd-Fe-B Permanent Magnets," *Materials Science and Engineering: A*, Vol. 359, pp. 375-383.
66. J. Qu, A. J. Shih (2003) "Analytical Surface Roughness Parameters of an Ideal Profile Consisting of Elliptical or Circular Arcs," *Machining Science and Engineering*, Vol. 7, pp. 281-294.
67. A. J. Shih, A. C. Curry, R. O. Scattergood, T. M. Yonushonis, D. J. Gust, M. B. Grant, S. B. McSpadden, T. Watkins (2003) "Grinding of Zirconia using the Dense Vitreous Bond Silicon Carbide Wheel," *ASME Journal of Manufacturing Science and Engineering*, Vol. 125, pp. 297-303.

68. B. J. Boothe, A. J. Shih, J. Kong, W. L. Roberts (2003) "Goniometric Characteristics of Optical Fibers for Temperature Measurement in Diesel Engine Exhaust Filters," *Measurement Science and Technology*, Vol. 14, pp. 563-572.
69. A. C. Curry, A.J. Shih, R. O. Scattergood, J. Kong, S.B. McSpadden (2003) "Grinding Temperature Measurements in MgO PSZ Using Infrared Spectrometry," *J. Am. Ceram. Soc.*, Vol. 86, pp. 333-341.
70. W. I. Clark, A. J. Shih, C. W. Hardin, R. L. Lemaster, S. B. McSpadden (2003) "Fixed Abrasive Diamond Wire Machining – Part I: Process Monitoring and Wire Geometry and Tension," *International Journal of Machine Tools and Manufacture*, Vol. 43, pp. 523-532.
71. W. I. Clark, A. J. Shih, R.L. Lemaster, S. B. McSpadden (2003) "Fixed Abrasive Diamond Wire Machining – Part II: Experiment Design and Results," *International Journal of Machine Tools and Manufacture*, Vol. 43, pp. 533-542.
72. M. G. Garrell, A. J. Shih, E. Lara-Curzio, R. O. Scattergood (2003) "Finite-Element Analysis of Stress-Concentration in ASTM D638 Tensile Test Specimens," *Journal of Testing and Evaluation*, Vol. 31, pp. 52-57.
73. M. G. Garrell, A. J. Shih, B. M. Ma, E. Lara-Curzio, R. O. Scattergood (2003) "Mechanical Properties of Nylon Bonded Nd-Fe-B Permanent Magnets," *Journal of Magnetism and Magnetic Materials*, Vol. 257, pp. 32-43.
74. J. Qu, L. Reister, A. J. Shih, R. O. Scattergood, E. Lara-Curzio (2003) "Nanoindentation Characterization of Surface Layers of Electrical Discharge Machined WC-Co," *Materials Science and Engineering: A*, Vol. 344, pp. 125-131.
75. B. K. Rhoney, A. J. Shih, R. O. Scattergood, J. L. Akemon, D. J. Gust, M. B. Grant (2002) "Wire Electrical Discharge Machining of Metal Bond Diamond Wheels for Ceramic Grinding," *International Journal of Machine Tool and Manufacture*, Vol. 42, pp. 1355-1362.
76. J. Qu, A. J. Shih, R. O. Scattergood (2002) "Development of the Cylindrical Wire Electrical Discharge Machining Process: Part I: Concept, Design, and Material Removal Rate," *ASME Journal of Manufacturing Science and Engineering*, Vol. 124, No. 3, pp. 702-707.
77. J. Qu, A. J. Shih, R. O. Scattergood (2002) "Development of the Cylindrical Wire Electrical Discharge Machining Process: Part II: Surface Integrity and Roundness," *ASME Journal of Manufacturing Science and Engineering*, Vol. 124, No. 3, pp. 708-714.
78. B. K. Rhoney, A. J. Shih, R. O. Scattergood, R. Ott, S.B. McSpadden (2002) "Wear Mechanism of Metal Bond Diamond Wheels Trued by Wire Electrical Discharge Machining," *Wear*, Vol. 252, pp. 644-653.
79. J. S. Strenkowski, A. J. Shih, J. C. Lin (2002) "An Analytical Finite Element Model for Predicting Three-Dimensional Tool Forces and Chip Flow," *International Journal of Machine Tools and Manufacture*, Vol. 42, pp. 723-731.
80. A. J. Shih, H. S. Yan (2002) "Synthesis of a Single-Loop, Overconstrained Spatial 6R Mechanism for Two-Position Cylindrical Rigid Body Guidance," *Mechanism and Machine Theory*, Vol. 37, pp. 61-73.
81. A. J. Shih, J. L. Akemon (2001) "Wear of the Blade Diamond Tools in Truing Vitreous Bond Grinding Wheels. Part I – Wear Measurement and Results," *Wear*, Vol. 250, pp. 587-592.
82. A. J. Shih, W. I. Clark, J. L. Akemon (2001) "Wear of the Blade Diamond Tools in Truing Vitreous Bond Grinding Wheels. Part II – Truing and Grinding Forces and Wear Mechanism," *Wear*, Vol. 250, pp. 593-603.
83. A. J. Shih (2001) "A New Regulating Wheel Truing Method for Through-Feed Centerless Grinding," *ASME Journal of Manufacturing Science and Engineering*, Vol. 123, No. 2, pp. 319-324.
84. A. J. Shih (2000) "An Experimental Investigation of Rotary Truing and Dressing of Vitreous Bond Wheels for Ceramic Grinding," *International Journal of Machine Tools and Manufacture*, Vol. 40, pp. 1755-1774.
85. A. J. Shih, M. B. Grant, T. M. Yonushonis, T. O. Morris, S. B. McSpadden (2000) "High speed and High Material Removal Rate Grinding of Ceramics Using the Vitreous Bond CBN wheel," *Machining Science and Technology*, Vol. 4, No. 1, pp. 43-58.
86. M. Tricard, D. J. Gust, A. J. Shih (1999) "Precision Thru-feed Centerless Grinding of Zirconia," *Machining Science and Technology*, Vol. 3, No. 2, pp. 201-219.
87. A. J. Shih, N. L. Lee, (1999) "Precision Cylindrical Face Grinding," *Precision Engineering*, Vol. 23, No. 3, pp. 177-184.
88. J. F. Tu, M. Corless, M. J. Gehrich, A. J. Shih (1998) "Experimental Study of a Precision Hydrodynamic Wheel Spindle for Submicron Cylindrical Grinding," *Precision Engineering*, Vol. 22, No. 1, pp. 43-57.
89. A. J. Shih (1998) "Rotary Truing of the Vitreous Bond Diamond Grinding Wheels using Metal Bond Diamond Disks," *Machining Science and Technology*, Vol. 2, pp. 13-28.
90. A. J. Shih, T.M Yonushonis, M.B. Grant, T.O. Morris, S.B. McSpadden (1998) "Vitreous Bond CBN Wheel for High Speed Grinding of Ceramic and M2 Steel," *Transactions of NAMRI/SME*, Vol. 26, pp. 195-200.

91. A. J. Shih (1996) "Finite Element Analysis of Orthogonal Metal Cutting Mechanics," *International Journal of Machine Tools and Manufacture*, Vol. 36, pp. 255-273.
92. A. J. Shih (1996) "Finite Element Analysis of the Rake Angle Effects in Orthogonal Metal Cutting," *International Journal of Mechanical Sciences*, Vol. 38, pp. 1-17.
93. A. J. Shih (1995) "Finite Element Simulation of Orthogonal Metal Cutting," *ASME Journal of Engineering for Industry*, Vol. 117, pp. 84-93.
94. A. J. Shih (1993) "Kinematics of Cycloidal Rotary Internal Combustion Engine Mechanism," *ASME Journal of Mechanical Design*, Vol. 115, pp. 953-959.
95. A. J. Shih (1993) "Analysis and Comparison of the Epicycloidal and Hypocycloidal Rotary Engine Mechanism," *ASME Journal of Mechanical Design*, Vol. 115, pp. 960-966.
96. A. J. Shih, H. T. Yang (1993) "Experimental and Finite Element Predictions of Residual Stresses due to Orthogonal Metal Cutting," *International Journal for Numerical Method in Engineering*, Vol. 36, pp. 1487-1507.
97. C. Kao, A.J. Shih (1992) "A Radial Method for Mechanism Optimal Design," *Engineering Optimization*, Vol. 20, pp. 179-186.
98. A. J. Shih, H. T. Yang (1991) "Experimental and Finite Element Simulation Methods for Rate-Dependent Metal Forming Processes," *International Journal for Numerical Method in Engineering*, Vol. 31, pp. 345-367.
99. H.T. Yang, M. Heinstein, A.J. Shih (1989) "Adaptive 2D Finite Element Simulation of Metal Forming Processes," *International Journal for Numerical Methods in Engineering*, Vol. 28, pp. 1409-1428.
100. W. M. Hwang, A. J. Shih (1987) "Optimal Synthesis of Suspension Mechanism with Variable Leverage Ratio," *Journal of the Chinese Society of Mechanical Engineers*, Vol. 8, pp. 43-50.
101. W. M. Hwang, A. J. Shih (1986) "A Design for Automatic Machining of the Die for Self-Tapping Screw," *Journal of the Chinese Society of Mechanical Engineers*, Vol. 7, pp. 109-113.

Pending (submitted)

- C. C. Kao, A. J. Shih, "Design and Tuning of the Adaptive Fuzzy Logic Controller for Micro-Hole Electrical Discharge Machining," *Journal of Manufacturing Processes*.
- B. Shen, G. Xiao, C. Guo, S. Malkin, A. J. Shih, "Thermocouple Fixturing Method for Grinding Temperature Measurement," *ASME Journal of Manufacturing Science and Engineering*.
- M. W. Chastagner, S. F. Miller, R. E. Dodde, J. D. Geiger, A. J. Shih, Experiment and Finite Element Modeling of the Bipolar Electrosurgical Vessel Sealing," *ASME Journal of Biomechanical Engineering*.

Refereed Conference Papers:

1. J.S. Gee, R. E. Dodde, J.D. Geiger, A.J. Shih (2008) "Experimental and Finite Element Analysis of the Thermal-Electric Process in Monopolar Electrosurgical Thermal Management," Proceedings of the 9th Biennial ASME Conference on Engineering Systems Design and Analysis, ESDA08, July 7-9, 2008, Haifa, Israel.
2. B. Shen, R.E. Dodde, E.C. Johnson, K. Chang, S.F. Miller, J.D. Geiger, A.J. Shih (2007) "Biomedical Manufacturing – Translational Research between Manufacturing and Healthcare," 2007 International Conference on Advanced Manufacture, SME, Nov. 26-28, Tainan, Taiwan.
3. R.E. Dodde, A. P. Advincula (2007) "A Novel Technique for Demonstrating the Real-Time Sub-Surface Tissue Thermal Profile of Two Energized Surgical Instruments," American Association of Gynecologic Laparoscopists, AAGL 36th Annual Meeting, Nov. 14-17, 2007, Washington, D.C., USA.
4. B. Shen, A. J. Shih, S. Tung (2007) "Application of Nanofluids in minimum quantity Lubrication Grinding," ASME/STLE International Joint Tribology Conference, Oct 22-24, San Diego, California, USA.
5. J.H. Chang, H. Hocheng, H.Y. Chang, and A.J. Shih, (2007) "Metal Removal Rate of Thiobacillus Thiooxidans without Pre-secreted Metabolite," Conference Advances of Materials and Processing Technology, Oct 7-11, 2007, Daejeong, Korea.
6. M.W. Chastagner, S.F. Miller, J.D. Geiger, A.J. Shih (2007) "Tissue Joining Using the Electrosurgical Method," Proceedings of the 2007 International Manufacturing Science and Engineering Conference MSEC2007, October 15-17, 2007, Atlanta, Georgia, USA.
7. R.E. Dodde, S.F. Miller, J.D. Geiger, A.J. Shih (2007) "Thermal-Electric Finite Element Analysis of Electrosurgical Cautery Process," Proceedings of the 2007 International Manufacturing Science and Engineering Conference MSEC2007, October 15-17, 2007, Atlanta, Georgia, USA.

8. C.C. Kao, S.F. Miller, A.J. Shih (2007) "Fuzzy Logic Control System for Micro-Hole Electrical Discharge Machining," Proceedings of the 2007 International Manufacturing Science and Engineering Conference MSEC2007, October 15-17, 2007, Atlanta, Georgia, USA.
9. T.D. Marusich, S. Usui, J. Ma, D.A. Stephenson, A. J. Shih (2007) "Finite Element Modeling of Drilling Processes with Solid and Indexable Tooling in Metals and Stack-ups," 10th CIRP International Workshop on Modeling of Machining Operations, Reggio Calabria, Italy, Aug. 27-28, 2007.
10. B. Shen, A.J. Shih (2007) "Thermocouple Fixturing Method for Grinding Temperature Measurement," International Symposium on Advanced Abrasive Technology 2007, Dearborn, MI, Sep. 26-28, 2007.
11. J. Feng, G.Y. Kim, A.J. Shih, J. Ni (2007) "Investigation of the Micro-end Grinding of Ceramics Using a Sintered Metal-bonded Microgrinding Wheel," International Symposium on Advanced Abrasive Technology 2007, Dearborn, MI, Sep. 26-28, 2007.
12. J. Tao, A.J. Shih (2007) "Dry and Near-Dry Electrical Discharge Milling Processes," 15th International International Symposium on Electromachining (ISEM XV), Pittsburgh, Pennsylvania, April 23-27, 2007, pp. 275-280.
13. C.C. Kao, J. Tao, A.J. Shih (2007) "Water Mist Near Dry Wire and Drilling Electrical Discharge Machining and Gap Distance Modeling," 15th International International Symposium on Electromachining (ISEM XV), Pittsburgh, Pennsylvania, April 23-27, 2007, pp. 281-286.
14. Z. Huang, A. J. Shih, J. Ni (2007) "Three Dimensional Optical Measurements for Automotive Applications," Internatoinal Conference on Competitive Manufacturing COMA'07, February 2007, Stellenbosch University, South Africa.
15. T.D. Marusich, S. Usui, R. Aphale, N. Saini, R. Li, A.J. Shih (2006) "Three-Dimensional Finite Element Modeling of Drilling Processes," ASME Manufacturing Science and Engineering Conference, Oct. 8-12, Ypsilanti, Michigan.
16. S.F. Miller, A.J. Shih (2006) "Friction Drilling – A Chipless Hole-Making Process," ASME Manufacturing Science and Engineering Conference, Oct. 8-12, Ypsilanti, Michigan.
17. Z. Huang, A.J. Shih, J. Ni (2006) "Laser Interferometry Hologram Registration for Three-Dimensional Precision Measurements," ASME Manufacturing Science and Engineering Conference, Oct. 8-12, Ypsilanti, Michigan.
18. A.J. Shih (2006) "Biomedical Manufacturing – A New Frontier of Manufacturing Research," ASME Manufacturing Science and Engineering Conference, Oct. 8-12, Ypsilanti, Michigan.
19. J. Tao, C.C. Kao, A.J. Shih (2006) "Near Dry Electrical Discharge Machining," 7th International Conference on Frontiers of Design and Manufacturing and 7th S. M. Wu Symposium on Manufacturing Sciences, June 21-24, Guangzhou, China.
20. R. Li, A.J. Shih (2006) "High throughput drilling of Ti alloys," 7th International Conference on Frontiers of Design and Manufacturing and 7th S. M. Wu Symposium on Manufacturing Sciences, June 21-24, Guangzhou, China.
21. Z. Huang, A. J. Shih, J. Ni (2005) "Quantitative Evaluation of Powder Spray Effects on Three-Dimensional Stereovision Measurements of Machined Components," CIRP-Sponsored 3rd International Conference on Reconfigurable Manufacturing, Ann Arbor, Michigan, May 9-12, 2005.
22. S.F. Miller, J. Qu, E. Shi, C.C. Kao, A.J. Shih (2004) "Investigation of Wire Electrical Discharge Machining of Thin Cross-Sections and Compliant Mechanisms," ASME IMECE, Anaheim, CA, Nov. 13-19, 2004.
23. R. Li, A.J. Shih (2004) "Finite Element Modeling of 3D Turning of Titanium," ASME IMECE, Anaheim, CA, Nov. 13-19, 2004.
24. J. Kong, A.J. Shih (2004) "Infrared Thermometry for Diesel Exhaust Aftertreatment Filter Temperature Measurement," 2004 SAE World Congress, March 8-11, Detroit, Michigan.
25. C. W. Hardin, J. Qu, A. J. Shih (2003) "Fixed Abrasive Diamond Wire Saw Slicing of Single Crystal SiC Wafers," ASME IMECE, Washington, D.C., Nov. 2003.
26. S. F. Miller, A. J. Shih (2003) "Investigation the Effect of Spark Cycle on the Material Removal Rate in Wire Electrical Discharge Machining," ASME IMECE, Washington, D.C., Nov. 2003.
27. J. Kong, M. Bakkal, S. F. Miller, A. J. Shih (2003) "Temperature Measurement in Ceramic Grinding, Machining of Bulk Metallic Glass, and Electrical Discharge Machining," NSF Workshop on Research Needs in Thermal Aspects of Material Removal Processes, Stillwater, Oklahoma, June 2003.
28. M. G. Garrell, B. M. Ma, E. Lara-Curzio, A. J. Shih, R. O. Scattergood (2002) "Mechanical Properties of Injection Molded Nd-Fe-B Permanent Magnets," *Intermag Europe 2002*, April 28 – May 2, 2002, Amsterdam, Netherlands.
29. J. Qu, A.J. Shih, R.O. Scattergood (2001) "Development of the Cylindrical Wire EDM Process," Symposium of Nontraditional Manufacturing Research and Applications, 2001 ASME IMECE New York, NY.
30. A.J. Shih, J.L. Akemon (2001) "Wear of the Blade Diamond Tools in Truing Vitreous Bond Grinding Wheels. Part I – Wear Measurement and Results," 2001 *Wear of Materials*, April 22-26, 2001, Vancouver BC, Canada.

31. A.J. Shih, W.I. Clark, J.L. Akemon (2001) "Wear of the Blade Diamond Tools in Truing Vitreous Bond Grinding Wheels. Part II – Truing and Grinding Forces and Wear Mechanism," *2001 Wear of Materials*, April 22-26, 2001, Vancouver BC, Canada.
32. D.J. Gust, A.J. Shih, M. Tricard, K. Subramanian (1996) "An Approach for Thru-Feed Grinding of Ceramic," *Symposium on Advanced Machining and Finishing Processes for Ceramics, Composites, and High Temperature Alloys*, ASME World Congress & Expo., Atlanta, GA.
33. A.J. Shih (1993) "Finite Element Analysis of the Rake Angle Effects in Orthogonal Metal Cutting," K. F. Ehmann, Ed., *Manufacturing Science and Engineering*, ASME PED-Vol. 64, pp. 475-483.
34. A.J. Shih, H.T. Yang S. Chandrasekar (1990) "Experimental and Finite Element Simulation of Metal Cutting Process with Strain Rate and Temperature Effects," Klamecki, B.E., and K. J. Weinmann, Ed., *Fundamental Issues in Machining*, ASME PED-Vol. 43, pp. 11-24.
35. K.F. Wang, A.J. Shih, M. Heinstejn, H.T. Yang, S. Chandrasekar (1990) "Finite Element Analysis of Heat Treatment, Metal Cutting and Forming," International Conference on Adv. in Structural Testing, Analysis, and Design, Bangalore, India.
36. W.M. Hwang, A.J. Shih (1985) "Analysis and Optimal Synthesis of Rear Suspension Mechanisms with Single Shock Absorber for Motorcycle," Proceedings of the 2nd National Conference on Mechanical Engineering, Kaoshiung, Taiwan.
37. A.J. Shih, W.M. Hwang (1985) "A Design for Automatic Manufacture of Self-Tapping Screw Dies," Proceedings of the 2nd National Conference on Mechanical Engineering, Kaoshiung, Taiwan.

Submitted

- J. Tao, J. Ni, and A.J. Shih, "Dry and Near-Dry EDM Milling of Ultra-Fine Surface Finish," Proceedings of the 8th International Conference on Frontiers of Design and Manufacturing, Sept. 23~26, 2008, Tianjin, China.
- H. Zheng, J.Z. Moore, J. Schwartz, C. McGill, P.W. McLaughlin, A.J. Shih, "Biopsy Needle Tissue Cutting Analysis," Proceedings of the 8th International Conference on Frontiers of Design and Manufacturing, Sept. 23~26, 2008, Tianjin, China.
- S. Arul, G. H. Kruger, S.F. Miller, T.Y. Pan, A.J. Shih, "Spot Friction Weld Strength Improvement Through In-Process Metal Matrix Formation," Proceedings of the 2008 International Manufacturing Science and Engineering Conference, Oct. 7-10, 2008, Evanston, IL.
- R. E. Dodde, J. Bull, A. J. Shih, "Electrical Resistivity Changes in Splenic Tissue Under Compression," 2008 BMES Annual Fall Meeting, Oct 2-4, 2008, St. Louis, MO.

Other Conference Papers:

1. A. F. Bastawros, A. Chandra, E. Teomete, A.J. Shih (2008) "Analysis of Wire Saw Process Parameters for Cutting of Ductile Materials," *2008 NSF CMMI Engineering Research and Innovation Conference*, Knoxville, TN Jan 7-10, 2008.
2. G. H. Kruger, S. F. Miller, S. Arul A. J. Shih, T. I. van Niekerk, D. G. Hattingh (2008) "Process Monitoring and Diagnosis of Spot Friction Welding," *2008 NSF CMMI Engineering Research and Innovation Conference*, Knoxville, TN Jan 7-10, 2008.
3. R. E. Dodde, S. F. Miller, J. D. Geiger, A. J. Shih (2008) "Thermal-Electric Finite Element Analysis of Electrosurgical Cautery Surgical Process," *2008 NSF CMMI Engineering Research and Innovation Conference*, Knoxville, TN Jan 7-10, 2008.
4. B. Shen, G. Xiao, C. Guo, S. Malkin, A.J. Shih (2008) "Heat Partition in MQL Grinding and Thermocouple Fixation Method for Grinding Temperature Measurement," *2008 NSF CMMI Engineering Research and Innovation Conference*, Knoxville, TN Jan 7-10, 2008.
5. S. F. Miller, H.-Y. Kuo, K. Meyer, K. Park, A. J. Shih, J. Ni (2007) "High Performance Machining Research at the S.M. Wu Manufacturing Research Center: A Review," *The Proceedings of OMNI-CNC 2007 Annual Meeting*, Nagano, Japan, July 2007.
6. A.F. Bastawros, A. Chandra, A.J. Shih (2006) "Analysis of Surface Waviness during Wire Saw Cutting of Ductile Materials," *2006 NSF Design, Service and Manufacturing Grantees and Research Conference*, St. Louis, MO, July 24-26, 2006.
7. B. Shen, A.J. Shih, G. Xiao, S. Malkin (2006) "Minimum Quantity Lubrication (MQL) Grinding Using Nanofluids," *2006 NSF Design, Service and Manufacturing Grantees and Research Conference*, St. Louis, MO, July 24-26, 2006.
8. R. Li, J. Qu, A.J. Shih (2005) "Finite Element Modeling of Titanium Machining," Third Wave Systems User Workshop, Dearborn, Michigan, May 4, 2005.

9. J.S. Strenkowski, J. Yan, J. Luo, A.J. Shih (2005) "Machining of Elastomers – Finite Element Modeling and Induction Heated Tool," *2005 NSF Design, Service and Manufacturing Grantees and Research Conference*, Scottsdale, AZ, Jan. 3-6, 2005.
10. A.F. Bastawros, A. Chandra, A.J. Shih (2005) "Precision Wire Saw Slicing of Semiconductor Wafers," *2005 NSF Design, Service and Manufacturing Grantees and Research Conference*, Scottsdale, AZ, Jan. 3-6, 2005.
11. R. Li, A.J. Shih (2004) "Finite Element Modeling of Titanium Machining," *Thirdwave Systems User Conference*, Dearborn, MI, May 4, 2004.
12. N. Gallego, A.J. Shih, D. P. Stinton, E. Jih (2004) "Graphite foam for cooling of automotive power electronics," *Carbon 2004 Conference*, July 11-16, Providence, RI.
13. J. Luo, A. J. Shih (2004) "Machining of Elastomers," *6th International Conference on Frontiers of Design and Manufacturing and 6th S. M. Wu Symposium on Manufacturing Sciences*, June 21-23, Xi'an, China.
14. Z. Huang, A. J. Shih, J. Ni (2004) "Reconfigurable 3D Precision Optical Measurements," *6th International Conference on Frontiers of Design and Manufacturing and 6th S.M. Wu Symposium on Manufacturing Sciences*, June 21-23, Xi'an, China.
15. J. Qu, P. J. Blau, A. J. Shih, S. B. McSpadden, G. M. Pharr, J. I. Jang (2004) "Scanning Acoustic Microscopy for Non-Destructive Evaluation of Subsurface Characteristics," *6th International Conference on Frontiers of Design and Manufacturing and 6th S.M. Wu Symposium on Manufacturing Sciences*, June 21-23, Xi'an, China.
16. S.B. White, D.D. Johnson, K. Pipe, N. Gallego, A.J. Shih, D. P. Stinton, E. Jih (2004) "Carbon Foam for Thermal Management of Power Electronics," *8th IEEE Workshop on Power Electronics in Transportation*, Oct. 21-22, 2004, Detroit, MI.
17. J. S. Strenkowski, A.J. Shih, J. Luo, J. Yan (2004) "The Use of Induction Heated Tools and Effective Fixture Design for Improving the Machinability of elastomers," *2004 NSF Design, Service and Manufacturing Grantees and Research Conference*, Dallas, TX, Jan. 5-8, 2004.
18. S. F. Miller, B. K. Rhoney, A.J. Shih, S. B. McSpadden (2004) "Electrical Discharge Machining of Metal Bond Diamond Wheels for Precision Grinding," *2004 NSF Design, Service and Manufacturing Grantees and Research Conference*, Dallas, TX, Jan. 5-8, 2004.
19. J. Kong, M. Bakkal, S. F. Miller, A. J. Shih (2003) "Temperature Measurement in Ceramic Grinding, Machining of Bulk Metallic Glass, and Electrical Discharge Machining," *NSF Workshop on Research Needs in Thermal Aspects of Material Removal Processes*, Stillwater, Oklahoma, June 2003, pp. 415-424.
20. J. Kong, A.J. Shih, R.O. Scattergood, T.M. Yonushonis, D.J. Gust, M.B. Grant, S.B. McSpadden (2003) "Cost-Effective Form Grinding of Zirconia using Silicon Carbide Wheels and Ceramic Grinding Temperature Measurement," *2003 NSF Design, Service and Manufacturing Grantees and Research Conference*, Birmingham, Alabama, Jan. 6-9, 2003.
21. J.S. Strenkowski, A.J. Shih, S. Rodkwan, M.A. Lewis (2003) "Machining of Elastomers – Experimental and Numerical Investigation," *2003 NSF Design, Service and Manufacturing Grantees and Research Conference*, Birmingham, Alabama, Jan. 6-9, 2003.
22. W.I. Clark, A.J. Shih, R.L. Lemaster, S.B. McSpadden (2002) "Fixed-Abrasive Diamond Wire Machining," *2002 NSF Design, Service and Manufacturing Grantees and Research Conference*, San Juan, Puerto Rico, Jan. 7-10, 2002.
23. J.S. Strenkowski, A.J. Shih, M.A. Lewis, S. Rodkwan, D.R. Poirier (2002) "Machining of Elastomers," *2002 NSF Design, Service and Manufacturing Grantees and Research Conference*, San Juan, Puerto Rico, Jan. 7-10, 2002.
24. B.K. Rhoney, A.J. Shih, R.O. Scattergood (2002) "Wire EDM Truing of Metal Bond Diamond Wheels for Precision Ceramic Grinding," *2002 NSF Design, Service and Manufacturing Grantees and Research Conference*, San Juan, Puerto Rico, Jan. 7-10, 2002.
25. B.K. Rhoney, A.J. Shih, R.O. Scattergood, J.L. Akemon, D.J. Gust, M.B. Grant (2001) "Wire EDM Truing of Metal Bond Diamond Wheels," *2001 ASPE Annual Meeting*, Crystal City, VA.
26. J. Qu, A.J. Shih, R.O. Scattergood, S.B. McSpadden (2001) "Cylindrical Wire Electrical Discharge Machining Process Development," *2001 ASPE Annual Meeting*, Crystal City, VA.
27. A.C. Curry, A.J. Shih, R.O. Scattergood, S.B. McSpadden, R.B. Dinwiddie (2001) "Infrared Spectrometry for Grinding Temperature Measurement," *2001 ASPE Annual Meeting*, Crystal City, VA.
28. A.J. Shih, T.M. Yonushonis, M.B. Grant, T.O. Morris, S.B. McSpadden (1998) "High speed and high material removal rate grinding of ceramics using the vitreous bond CBN wheel," *ASPE 13th Annual Meeting*, Oct. 25-30, St. Louis, MO.

- 29.S.B. McSpadden, T.O. Morris, A.J. Shih (1997) "High Speed Cylindrical Grinding of Heavy Duty Diesel Engine Components," Annual Automotive Technology Development Customers' DOE Coordination Meeting, Dearborn, MI, Oct. 27-30.
- 30.A.J. Shih, M.B. Grant (1996) "An Investigation of Truing Parameters for Grinding Zirconia," Superabrasive Technology 1996, Lawrence Livermore National Lab., November 7-8, Livermore, CA.
- 31.A.J. Shih, D.J. Gust, M.B. Grant (1996) "Precision Grinding of Ceramic Diesel Engine Components," ASPE Spring Topical Meeting, Annapolis, MD.
- 32.P. Vishnupad, Y.C. Shin, A.J. Shih (1995) "Monitoring of an Internal Grinding Process," SME Grinding Conference, Detroit, MI.

Research Grants

PI: Albert Shih (Collaborative project with Prof. Kornel Ehmann) Sponsor: NSF, Award Period: 1-1-2009 to 12-31-2011

Project: Tissue Cutting Mechanics - Investigation of the Effective and Minimally Invasive Biopsy

PI: Albert Shih, Sponsor: NSF, Award Period: 3-1-2008 to 5-31-2009

Project: DDEP - Biopsy and Interstitial Brachytherapy Needle Devices for Tissue

PI: Albert Shih, Sponsor: UM Health Systems, Award Period: 2-1-2008 to 1-31-2009

Project: Tracking Technologies for Hospital Equipment Workflow Optimization

PI: Albert Shih, Sponsor: UM Department of Anesthesiology, Award Period: 1-1-2008 to 6-30-2008

Project: Real-time Operating Room based Virtual Cardiac Visualization of Critical Events

Participant: Albert Shih, (PI: Dan Clauw), Sponsor: NIH Clinical and Translational Science Awards (CTSA) Award Period: 9-17-2007 to 5-31-2012

Project: Michigan Institute for Clinical and Health Research (MICHR), Novel Methodologies

PI: Albert Shih, Sponsor: UM Department of Radiation Oncology, Award Period: 2-1-2007 to 12-31-2008

Project: Radiation Seed Implanting and Biopsy

PI: Albert Shih, Sponsor: NSF, Award Period: 10-1-2007 to 9-30-2008

Project: Co-Sponsoring of the 2007 SME International Conference on Advanced Manufacturing (ICAM)

Co-PI: Albert Shih (James Geiger and Joseph Bull, PI), Sponsor: Coulter Foundation, Award Period: 4-1-2007 to 3-31-2008

Project: Novel Technology for Controlling Electrosurgical Thermal Spread

PI: Albert Shih, Sponsor: NSF, Award Period: 7-15-2007 to 6-30-2010

Project: Friction Stir Alloying and Additive Processes

PI: Albert Shih, Sponsor: UM GAP grant, Award Period: 4-1-2007 to 12-31-2007

Project: Hydraulic Regenerative Braking / Two-Stage Hydraulic Regenerative Braking for a Bicycle

PI: Albert Shih, Sponsor: Caterpillar, Award Period: 10-2004 to 5-2007

Project: Electrical Discharge Machining (EDM) Process for Diesel Injector Microholes

PI: Albert Shih, Sponsor: GE Research, Award Period: 1-1-2006 to 12-30-2007

Project: Fabrication of Micro Channels for Power Electronic Cooling

PI: Albert Shih, Sponsor: Ford Motor Company, Award Period: 10-1-2006 to 12-30-2006

Project: Finite Element Analysis and Design of Spot Friction Welding Tool

PI: Albert Shih, Sponsor: General Motors Powertrain, Award Period: 5-1-2006 to 4-30-2008

Project: GrindSim Face Grinding Modeling

PI: Albert Shih (co-PI: Kevin Pipe), Sponsor: General Motors Discovery, Award Period: 5-1-2006 to 12-30-2008
Project: Nanofluid for the next-generation vehicle thermal management

PI: Albert Shih (co-PI: Dr. James Geiger), Sponsor: NSF, Award Period: 9-1-2006 to 8-31-2009
Project: Tissue Machining - A Novel Surgical Thermal Management System (STMS)

PI: Albert Shih, Sponsor: UM CRLT Gilbert Witaker Teaching Fund, Award Period: 5-1-2006 to 4-30-2007
Project: Medical Design and Manufacturing – A New Course Bridging the Teaching of Innovative Engineering Technologies for Medical Applications

Co-PI: Albert Shih (PI: Adnold Advincula), Sponsor: UM Translational Research Innovation Fund (TRIP), Award Period: 5-1-2006 to 4-30-2007

Project: Nerve sparing using high thermal gradients and a novel surgical thermal management system

Co-PI: Albert Shih (PI: Zoran Filipi), Sponsor: EPA, Award Period: 8-1-2005 to 12-31-2008
Project: Integrated Hydraulic Hybrid Propulsion System and Component for Minimizing Fuel Efficiency and Emission Benefits

PI: Albert Shih, Sponsor: NSF, Award Period: 9-1-2005 to 8-31-2007
Project: DDEP -- Exploring the Friction Drilling: An Environmentally Benign Sheet Metal Hole-Making Process

PI: Albert Shih, Sponsor: NSF, Award Period: 4-1-2006 to 3-31-2007
Project: Co-Sponsoring of the 7th International Conference on Frontiers in Design and Manufacturing

Co-PI: Albert Shih (PI: Jun Ni), Sponsor: NIST ATP/POM Group, Award Period: 9-1-2004 to 8-31-2008
Project: Dry EDM and Machine Thermal Error Compensation (ATP subcontract)

PI: Albert Shih, Sponsor: Powerix, Award Period: 9-1-2004 to 6-31-2005
Project: Fundamental Aspects of Mesoscale Internal Combustion Engine

Co-PI: Albert Shih (PI: Jun Ni), Sponsor: GE Aircraft Engine, Award Period: 4-1-2005 to 12-31-2009
Project: Advanced Manufacturing Technologies for Aircraft Engines

Co-PI: Albert Shih (PI: Steve Skerlos), Sponsor: EPA, Award Period: 9-1-2004 to 6-31-2009
Project: Design of Environmentally Conscious Vehicle Systems (senior capstone design projects)

PI: Albert Shih (Collaborative project with Prof. Stephen Malkin of University of Massachusetts), Sponsor: NSF
Award Period: 9-1-2004 to 8-31-2007
Project: GOALI: Minimum Quantity Lubrication (MQL) Grinding Using Nanofluids

PI: Albert Shih, (Collaborative project with Profs. Abhijit Chandra and Ashraf Bastawros of Iowa State University),
Sponsor: NSF, Award Period: 6-1-2004 to 5-31-2007
Project: Wire Sawing – Dynamic Mechanics and Design Space Exploration

PI: Albert Shih, Sponsor: UT-Battelle LLC, Oak Ridge National Lab, DOE, Award Period: 3-31-2004 to 7-15-2006
Project: Investigation of the Friction Drilling Process

PI: Albert Shih, Sponsor: UT-Battelle LLC, Oak Ridge National Lab, DOE, Award Period: 2-6-2004 to 3-15-2006
Project: Power electronic cooling – carbon foam

PI: Albert Shih, Sponsor: UT-Battelle LLC, Oak Ridge National Lab, DOE, Award Period: 1-1-2003 to 12-31-2007.
Project: Diesel exhaust filter temperature measurement and cost-effective machining of titanium alloys

PI: Albert Shih, Sponsor: NSF, Award Period: 5-1-2004 to 4-30-2005
Project: Planning Visit: Collaboration in Precision Manufacturing Research in China

At North Carolina State University

PI: Albert Shih Sponsor: NC Dept of Environment and Natural Resources, Award Period: 6-1-2001 to 5-31-2003
Project: Tooling Development for Scrap Tire Recycling

PI: Albert Shih (co-PI: John Strenkowski), Sponsor: Michelin Americas R&D; Award Period: 12-1999 to 9-2002
Project: Investigation of Rubber Machining and Molding Processes

PI: Albert Shih, Sponsor: NC Space Grant Consortium, Award Period: 5-1-2001 to 2-1-2002
Project: Light-Weight Gradient Foam Structures for Aerospace Applications

PI: Albert Shih (co-PI: Ron Scattergood) Sponsor: UT-Battelle LLC, Oak Ridge National Lab, DOE, Award
Period: 8-13-2001 to 12-31-2003
Project: Cylindrical Wire Electrical Discharge Machining and Temperature Measurement

Co-PI: Albert Shih (PI: John Strenkowski), Sponsor: NSF, Award Period: 5-1-2001 to 6-30-2004.
Project: Machining of Elastomers and Elastomer-Steel Composites

PI: Albert Shih, Sponsor: Magnequench Technical Center, Award Period: 1-1-2001 to 8-15-2001
Project: Mechanical Properties of Permanent Magnet Materials

Participant: Albert Shih (PI: Richard Lemaster). Sponsor: USDA Wood Machining & Tooling Program, Award
Period: 9-2000 to 12-2001
Project: Investigation of the Diamond Wire Saw Machining of Woods

PI: Albert Shih, Sponsor: National Collegiate Inventors and Innovators Alliance (NCIIA), Award Period: 9-1-2000
to 8-31-2001
Project: Precision Wire Saw Machining of Advanced Engineering Materials

PI: Albert Shih, Sponsor: NSF, Award Period: 7-1-2000 to 6-31-2004
Project: CAREER: Cost-Effective Precision Form Grinding of Advanced Materials

PI: Albert Shih, Sponsor: Furniture Manufacturing & Management Center, Award Period: 7-1-2000 to 6-31-2001
Project: Investigation of the Blasting Process for Furniture Manufacturing

PI: Albert Shih, Sponsor: NSF, Award Period: 6-1-2000 to 5-31-2001
Project: Precision Wire Saw Machining of Ceramic Materials

PI: Albert Shih (co-PI: Ron Scattergood), Sponsor: Cummins, Award Period: 10-01-1999 to 11-30-2000
Project: Cylindrical Wire EDM Truing of Metal Bond Diamond Wheel and SiC Grinding of Ceramics

PI: Albert Shih, Sponsor: NC State University, Faculty Research and Professional Development Fund, Award
Period: 1-1-2000 to 12-31-2000
Project: Precision Wire Saw Slicing of Silicon Wafers and Advanced Electronic Materials"

PI: Albert Shih (co-PI: Ron Scattergood), Sponsor: UT-Battelle LLC, Oak Ridge National Lab, DOE, Award
Period: 06-01-1999 to 9-30-2000
Project: Cylindrical Wire Electrical Discharging Process Development

PI: Albert Shih, Sponsor: Black and Decker (Equipment Grant)
Project: Huffman 5-axis Grinding Machine

PI: Albert Shih, Sponsor: National Collegiate Inventors and Innovators Alliance (NCIIA), Award Period: 06-01-1999 to 5-30-2000

Project: Wire Electrical Discharge Machining of Cylindrical Components

PI: Albert Shih (co-PI: Ron Scattergood), Sponsor: Cummins, Award Period: 11-01-1998 to 9-30-1999

Project: Investigation of the Grinding Debris Assist Dressing for Cost-Effective Grinding of Ceramics and Cermets

PI: Albert Shih, Cummins, Sponsor: NIST Advanced Technology Program, Award Period: 12-1997 to 11-2000

Project: Sub-Micron Precision Grinding of Advanced Engineering Materials

SERVICE

Committee Assignments at U of M

2007-date: Executive Advisory Committee, Tauber Institute

2007-date: Operating Committee, CTSA University of Michigan

2003-date: Manufacturing Council, Program in Manufacturing

2006-2007: ME, Undergraduate Committee, Shop Committee (Chair), Faculty Search Committee

2005-2006: ME, Design and Manufacturing faculty group coordinator, Undergraduate Committee, Faculty Search Committee

2004-2005: ME, Design and Manufacturing faculty group coordinator, Undergraduate Committee.

2003-2004: ME, Graduate Committee, Award Committee, Shop Committee

Service to Professional Organization

Associate Editor:

ASME Journal of Manufacturing Science and Engineering (2000-2006)

International Journal for Manufacturing Science and Production (1996-1999, 2003-date)

Guest Editor:

Special Issue of Biomedical Manufacturing, *ASME Journal of Manufacturing Science and Engineering* (2007)

Editorial Board: *International Journal of Nanomanufacturing* (2006-date)

Reviewing Committee: *International Journal of Machine Tools and Manufacture* (2002 - date)

Scientific Committee: *North American Manufacturing Research Institute (NARMI)* (2006 - date)

Conference Organizer and Chairman:

- Scientific Committee, 12th International Symposium on Advances in Abrasive Technology (ISAAT 2009), Gold Coast, Australia, Sept. 2009.
- Co-organizer, 2007, 10th International Symposium on Advances in Abrasive Technology (ISAAT), Dearborn, MI.
- Co-host, 2006 ASME Manufacturing Science and Engineering Conference (MSEC), Ypsilanti, MI.
- Co-chairman, *Symposium of Nontraditional Manufacturing Research and Applications*, ASME IMECE, 2001, New York, NY.
- Co-organizer, *Symposium on Sensors and Control*, ASME IMECE 1999, Nashville, TN.
- Organizing committee, SME NAMRC XXVI at Georgia Institute of Technology, 1998.
- Co-organizer, *Symposium on Advanced Machining and Finishing Processes for Ceramics, Composite and High Temperature Alloys*, ASME IMECE, 1996, Atlanta, GA.
- Co-chairman, *Symposium on Intelligent Design and Manufacturing*, ASME WAM, 1993, New Orleans, LA.

Consulting

Schellenberg Wittmer, 2007-2008

Round Table Group, 2004-date

Caterpillar, 2005-2007

ECLS, 2005

Corsair, 2002-2003

Cummins Inc., 1999-2001
Design Ideas, 1999

HONORS AND AWARDS

- ASME Fellow, 2008
- Outstanding Paper Award, 2007, NAMRI/SME on “Finite Element Modeling of High-Throughput Drilling of Ti-6Al-4V”
- 2006 Gilbert Whitasker Teaching Fund on the development of “Biomedical Design and Manufacturing”
- Best Paper Award, 2004, The 6th International Conference on Frontiers of Design and Manufacturing and the 6th S.M. Wu Symposium on Manufacturing Science, Xi’an, China
- SAE Ralph Teetor Education Award, 2004
- NSF CAREER Award, 2000
- ASME IMECE BOSS Award, 1999

Advisor for Student Awards:

- 3rd place, Student Paper Presentation Award, 2007, NAMRI/SME on “Abrasive Jet Machining for Edge Generation” (Student: Matthew Chastagner)
- 2nd Place, Student Design Competition, 2006 ASME Manufacturing Science and Engineering Conference (MSEC) (Students: Brandon Lloyd, David Ohrin, David Krumanaker)

TEACHING

New/Revised Courses Introduced at Univ. of Michigan:

- ME599 Biomedical Design and Manufacturing (2006 UM CRLT Gilbert Whitasker Teaching Fund)
- ME482 Machining – Newly revised to three credit hours with a lab, new Lab modules with tissue machining and machining modeling

Ph.D. Committees Chaired

Current students:

- Matthew Chastagner
- Steve White (co-chair with Kevin Pipe)
- Jie Feng (co-chair with Jun Ni)
- Yuanyuan Zhou (co-chair with Jack Hu)
- Masa Fujiki (co-chair with Jun Ni)
- Daniel Johnson
- Senthil Arul
- Robert Dodde
- Jason Moore
- Li-Jung Tai
- Zhen Qiu (co-chair with Thomas Wang)
- Carl McGill

Graduated: (): current company/university, “ “: Dissertation title

1. Jia Tao (2008, Schlumberger) “Investigation of Dry and Near Dry Electrical Discharge Milling Processes”
2. Jie Zhu (2008, Cummins) “Robust Thermal Error Modeling and Compensation for Machine Tools”
3. Bin Shen (2008, Procter & Gamble) “Minimum Quantity Lubrication Grinding Using Nanofluids”
4. C.C. Kao (2007, Cummins) “Monitoring and Control of Micro-Hole Electrical Discharge Machining”
5. Rui Li (2007, Schneider Electric) “Experimental and Numerical Analysis of High-Throughput Drilling of Titanium Alloys”
6. Zhenhua Huang (2006, Coherix) “Three-Dimensional Laser Holographic Interferometry Measurements”
7. Scott Miller (2006, Assistant Professor, Univ of Hawaii) “Friction Drilling”
8. Jie Luo (2005, Cummins, Solid Oxide Fuel Cell) ”Machining of Elastomers”

9. Mustafa Bakkal (2004, Assistant Professor, Istanbul Technical University, Mechanical Engineering) “Machining of Bulk Metallic Glass”
10. Jian Kong (2003, Ford Motor Company, Scientific Research Lab) “Infrared-Based Temperature Measurement in Ceramics Grinding and Diesel Exhaust Aftertreatment Filters”
11. Jun Qu (2002, Oak Ridge Natl Lab, Metals and Ceramics Division) “Development of Cylindrical Wire Electrical Discharge Machining Process and Investigation of Surface Integrity and Mechanical Property of EDM Surface Layers”

M.S. Committees Chaired

Current students:

- Jacob Gee
- Mathieu Davis

Graduated: (year, current affiliation)

1. Eric Johnson (2007, Mathwork) “Force Modeling of the Face Grinding Process”
2. Ya-Ni Chen (2007, Foxconn) “Nanofluid Characterization and Application in Radiator Systems”
3. Jason Moore (2007, PhD student, University of Michigan) “Dry Sump Pump Bubble Elimination for Hydraulic Hybrid Vehicle Systems”
4. Waihua Fong (2007, TRW) “Package Design for High Precision Machine Vision Systems”
5. Adrian Vine (2007, OG Technologies) “Application of Design Methodology to the Cooling System of an In-Line Machine Vision System”
6. Daniel Ketchum (2005, GE) “Generation of Micro-Size Conductive Lines Using the Direct Write of Nano-Particles”
7. Robert Dodde (2005, PhD student, University of Michigan) “Sparing of Neurovascular Tissue Utilizing High Thermal Gradients”
8. Daniel J. Johnson (2005, PhD student, University of Michigan) “Surface Effects of Biomachining Pure Copper”
9. Rui Li (2004, Schneider Electric) “Finite Element Modeling of Titanium Turning”
10. Craig W. Hardin (2003, CREE) “Fixed-Abrasive Diamond Wire Saw Slicing of Single Crystal SiC Wafers and Wood”
11. Scott F. Miller (2003, Univ. of Hawaii) “Wire Electro-Machining of Advanced Engineering Materials”
12. Edward Cookson (2003, Porvair) “Development of the Metal Foam Electrical Resistance Heater”
13. Mark A. Lewis (2002, Urethane Innovators, Inc.) “End Milling of Elastomers”
14. Monika G. Garrell (2002, Pfizer) “Mechanical Properties of Injection Molded Nd-Fe-B Type Permanent Magnets”
15. Brian J. Boothe (2002, Corsair) “Goniometric Characteristics of Sapphire Optical Fibers Goniometric Characteristics of Sapphire Optical Fibers”
16. William I. Clark (2001, Naval Research Center) “Fixed Abrasive Diamond Wire Saw Machining”
17. Brian K. Rhoney (2001, Corning) “Cylindrical Wire Electrical Discharge Truing of Metal Bond Diamond Grinding Wheels”
18. Adam C. Curry (2001, Becton Dickinson) “Methods of Measuring Flash Temperature in the Grinding of MgO-Doped PSZ”

Post Doctoral Supervised

Scott Miller (2006-2008)

Grant Kruger (2007-date)