

CENTER FOR ADVANCED VEHICULAR SYSTEMS (CAVS)
Bagley College of Engineering at Mississippi State University
FY07

Third Quarter Report
1 January to 31 March

EXECUTIVE SUMMARY
From Director, Rand M. German

I am pleased to report significant gains for CAVS on many fronts. Indeed we probably have moved from the “building” process into an established and “well-respected” interdisciplinary research, development and extension enterprise. During the third quarter of fiscal year 2007 (January – March), the Center for Advanced Vehicular Systems (CAVS) faculty and staff’s proposal activity included 15 awards totaling \$4,669,576 and 4 continuation awards totaling \$5,159,988. This gave a net award inflow of \$9,829,564 while CAVS had a net expenditure of \$3,800,585.33.

CAVS research participation for the quarter included:

- 30 faculty
- 46 research associates
- 8 postdoctoral fellows
- 51 graduate students
- 49 undergraduate students
- 2 visiting researchers
- 20 academic departments represented

Highlights from the detailed listing include the following:

- 28 proposals, totaling \$6,497,085 were submitted for future funding
- CAVS staff submitted 13 articles for publication and 11 conference submissions
- During the same time CAVS was responsible for
 - 31 published articles
 - 39 presentations
 - 6 new patent disclosures

I. Activities

A. Proposal Submissions by PI’s and Co-PI’s

Arockiasamy, Antonyraj -	1	Horstemeyer, Mark -	5	Rowland, Zach -	2
Babski-Reeves, Kari -	2	Jin, Mingzhou -	2	Sheely, Robert -	3
Carruth, Daniel -	2	Kim, Seong-Gai -	1	Walden, Clay -	7
Dennis, Glenn -	2	Littell, Neil -	1	Wang, Paul -	4
Ekşioglu, Burak -	2	McGinley, John -	2	Zhang, Li -	1
Ekşioglu, Sandra -	2	McFadyen, Gary -	1		
German, Rand -	4	Martin, Paul -	1		
Greenwood, Allen -	1	Park, Seong Jin -	3		
Haupt, Tomasz -	6	Potirniche, Gabriel -	2		

B. Publication Submission

- “A Non-standard Anisotropic Diffusion for Edge-preserving Noise Removal,” H. Lim, N. Williams, *Journal of Systemics, Cybernetics and Informatics*, February, 2007, accepted.
- “Analysis of History Effect on the Microstructure of an Automotive Material During Sequential Thermomechanical Process,” R.S. Yassar, C. Burton, J. Murphy, M.F. Horstemeyer, P.T. Wang, H. El Kadiri, *Materials Science and Engineering A*.
- “Automotive Distribution Network Design: A Perspective from Mississippi,” Sandra D. Eksioglu, Burak Eksioglu, Clayton T. Walden, Mingzhou Jin, Ambarish Acharya, *Journal of Transportation Research Forum*.
- “Damage and Stress State Influence on the Bauschinger Effect in Aluminum Alloys,” J.B. Jordon, M.F. Horstemeyer, K. Solanki, Y. Xue, *Mechanics of Materials*, accepted.
- “Dynamic Load Balancing With Adaptive Factoring Methods in Scientific Applications,” R. L. Carino, I. Banicescu, *Journal of Supercomputing*.
- “Fatigue Crack Growth Mechanisms in High Pressure Die Cast Magnesium Based Alloys,” H. El Kadiri, M.F. Horstemeyer, P.T. Wang, J. Jordon, Y. Xue, *Metallurgical and Materials Transactions A*.
- “Grain Size Measurement and Modeling for Nano-Structured Tungsten Carbide,” Seong Jin Park, Kristina Cowan, John L. Johnson, Randall M. German, *International Journal of Refractory Metals & Hard Materials*, 2007, accepted.
- “Master Decomposition Curve for Binders in PIM Processing,” G. Aggarwal, S.J. Park, I. Smid, R. M. German, *Metallurgical and Materials Transactions A*, 2007, in press.
- “Master Curves Based on Time Integration of Thermal Work in Particulate Materials,” Seong Jin Park, Randall M. German, *International Journal of Materials and Structural Integrity*, 2007, in press.
- “Process Simulation of Powder Injection Molding. I. Identification of Significant Parameters during The Mold Filling Phase,” S.V. Atre, S.J. Park, R. Zauner, R. M. German, *Powder Metallurgy*, 2007, in press.
- “Ranking Billions of Web Pages using Diodes,” R. Kaul, Y. Yun, S.G. Kim, *Science*.
- “Sensitivity Analysis by the Adjoint Variable Method for Optimization of the Die Compaction Process in Particulate Materials Processing,” Suk Hwan Chung, Young-Sam Kwon, Seong Jin Park, Randall M. German, Submitted for publication to *ASME Journal of Engineering Materials Technology*, 2007.
- “The Effect of Training Context on Fixations Made During Visual Discrimination,” R. Brou, T. Garrison, S. Doane, G. Bradshaw, (2007), *29th Annual Meeting of Cognitive Science Society*, Nashville, TN, 2007.

C. Conference Full Paper Submission

- “Cross Validation of an Infrared Motion Capture System and an Electromechanical Motion Capture Device,” M. Thomas, J. McGinley, D. Carruth, C. Blackledge, Proceedings of the Society of Automotive Engineers Digital 2007 Human Modeling Conference, Seattle, WA, 2007.
- “Densification and Grain Growth During the Sintering of Nanoscale SiC,” M. Bothara, S.J. Park, R.M. German, T.S. Sudarshan, R. Radhakrishnan, S.V. Atre, the 2007 NSTI Nanotechnology Conference and Trade Show, Santa Clara, CA, May 20-24, 2007.

- “Design & Fabrication of Ceramic Microarrays Using Powder Injection Molding,” S.V. Atre, C. Wu, S.J. Park, K. Simmons, The 2007 NSTI Nanotechnology Conference and Trade Show, Santa Clara, CA, May 20-24, 2007.
- “Effectiveness of a Dynamic Load Balancing Library for Scientific Applications,” R. Chaube, R.L. Carino, I. Banicescu, ISPDC 2007 – the 6th International Symposium on Parallel and Distributed Computing, July 5-8, 2007, Hagenberg, Austria, February, 2007.
- “Microfluidic Device Design by PIM: CAE Analysis,” Seokyoung Ahn, Sundar V. Atre, Seong-Jin Park, Randall M. German, *The 2007 ASEE Gulf-Southwest Annual Conference*, South Padre Island, TX, March 28-30, 2007.
- “Micromechanical Simulation of Cyclic Plasticity at Inclusion Particles with Pre-Over Straining,” Y. Xue, A.M. Wright, K. Solanki, M.F. Horstemeyer, D.L. McDowell, 48th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Honolulu, HI, April 23-26, 2007.
- “Nanoscale SiC Sintered Structures for Power Electronics Packaging and Advanced Microsystems,” Manish Bothara, Sundar Atre, S.J. Park, R.M. German, Ceramic Interconnect and Ceramic Microsystems Technologies (CICMT 2007), Denver, CO, April 23-26, 2007.
- “On the Formulation of a Classical Crystal Plasticity Model,” E. Marin, Plasticity 07, Alaska, June 2-6, 2007.
- “Pilot Expertise and Instrument Failure: Detecting Failure Is,” R. Brou, S. Doane, D. Carruth, G. Bradshaw, *Proceedings of the 51st Annual Meeting of the Human Factors and Ergonomics Society*, Baltimore, MA, 2007.
- “Powder Injection Molded Ceramic Microsystems,” Sundar Atre, S.J. Park, R.M. German, Ceramic Interconnect and Ceramic Microsystems Technologies (CICMT 2007), Denver, CO, April 23-26, 2007.
- “Quantitative Uncertainty Analysis for a Mechanistic Multistage Fatigue Model,” Y. Xue, K. Solanki, G.W. Steele, M.F. Horstemeyer, J. Newman, Jr., 48th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Honolulu, HI, April 23-26, 2007.

D. Conference Abstract Submission

- “Alternative Foot Brake on User Perception and Performance,” J. Kang, K. Babski-Reeves, J. McGinley, *10th Applied Ergonomics Conference*, Dallas, TX, 2007.
- “An Physically Motivated Uncertainty-Based Higher Order Plasticity and Damage Model,” K. Solanki, M. F. Horstemeyer, MCMAT2007-30120, ASME Applied Mechanics and Materials Conference, University of Texas at Austin, June 3-7, 2007.
- “Artificial Neural Network Modeling of Dislocation Microstructures-Property Relationships,” R.S.Yassar, O. AbuOmar, E. Hensen, M.F. Horstemeyer, Plasticity Meeting’07, Anchorage, AK, June, 2007.
- “Atomistic Simulation for Activation Sintering Mechanism of Tungsten by Additives,” Amitava Moitra, Sungho Kim, Seong-Gon Kim, Seong Jin Park, Randall M. German, PowderMet 2007, Denver, CO, May 13-16, 2007.
- “Densification and Grain Growth During the Sintering of Nanoscale SiC,” M. Bothara, S.J. Park, R.M. German, T.S. Sudarshan, R. Radhakrishnan, S.V. Atre, the 2007 NSTI Nanotechnology Conference and Trade Show, Santa Clara, CA, May 20-24, 2007.

- “Design & Fabrication of Ceramic Microarrays Using Powder Injection Molding,” S.V. Atre, C. Wu, S.J. Park, K. Simmons, the 2007 NSTI Nanotechnology Conference and Trade Show, Santa Clara, CA, May 20-24, 2007.
- “Development of the High performance W-Cu Electrode,” Young-Sam Kwon, Seong-Taek Chung, Seong Lee, Joon-Woong Noh, Seong-Jin Park, Randall M. German, PowderMet 2007, Denver, CO, May 13-16, 2007.
- “Dislocation Mobility in Mg and Mg/Al Alloys by Molecular Dynamics Simulations,” S. Groh, B. Jelinek, M.F. Horstemeyer, USNCCM, San Francisco, CA, 2007.
- “Internal State Variable Modeling of Structure-Property Relationships in Deformed Microstructures,” M.F. Horstemeyer, K. Solanki, The Minerals, Metals, and Materials Society, 2007 TMS Annual Meeting & Exhibition, Orlando, FL, February 25–March 1, 2007.
- “Investigation of Fatigue Properties of LENS Fabricated 4140 Steel Alloy,” G.P. Potirniche, R. Gomez, J. Ramsay, P.T. Wang, M. F. Horstemeyer, Seventh International ASTM/ESIS Symposium on Fatigue and Fracture (36th ASTM National Symposium on Fatigue and Fracture Mechanics), Tampa, FL, Nov. 14-16, 2007.
- “Leveraging CATIA V5 and Virtools for Environment Simulation,” D. Carruth, N. Littell, *COE 2007 Annual PLM Conference & TechniFair*, Las Vegas, NV, 2007.
- “Linking Homogenization and Densification in Tungsten Heavy Alloys,” Guneet Sethi, Seong Jin-Park, John L. Johnson, Randall M. German, PowderMet 2007, Denver, CO, May 13-16, 2007.
- “Master Decomposition Curve of Nanoparticulate-Filled Polymer,” O. P. Valmika Nathan, Sundar V. Atre, Seong-Jin Park, John Simonsen, PowderMet 2007, Denver, CO, May 13-16, 2007.
- “Mechanical and Physical Properties of Noval Scandium Containing Mixed Powder Sintered Aluminum,” F. Findik, K. Thompson, A. Antonyraj, S.J. Park, R.M. German, PowderMet 2007, Denver, CO, May 13-16, 2006.
- “Micromechanical Simulation of Cyclic Plasticity at Inclusion Particles with Pre-Over Straining,” Y. Xue, K. Solanki, A. Wright, M.F. Horstemeyer, AIAA, March, 2007.
- “Microstructural-Property Characterization of a Dodge Neon Passenger Car,” I. Carrasquel, M.F. Horstemeyer, K. Solanki, C. Burton, MS&T '07 (Materials Science & Technology 2007 Conference and Exhibition), Detroit, MI, September 16-20, 2007.
- “Microstructure of Tungsten Copper and Model to Predict Thermal Conductivity,” Seong Jin Park, John Johnson, Reza Yassar, Young-Sam Kwon, Randall M. German, Ralph B. Dinwiddle, Wallace D. Porter, PowderMet 2007, Denver, CO, May 13-15, 2007.
- “Multiscale Modeling in Powder Metallurgy: Atomistic, Discrete Element, and Finite Element Simulations,” Seong Jin Park, Seong-Gon Kim, Mark Horstemeyer, Randall M. German, UKC (US-Korea Conference) 2007, August 9-12, 2007, Washington, DC.
- “Model Based Decision Making Through Simulation-Optimization Decision Support Systems,” Allen Greenwood, Travis Hill, Flexsymposium, Park City, UT, May 14, 2007.
- “Novel Methodology to Quantify Tool Wear in Powder Metallurgy,” J.K. Thompson, S.J. Park, R.M. German, F. Findik, A. Antonyraj, PowderMet 2007, Denver, CO, May 13-16, 2006.
- “Numerical Investigations of Mixing for Powder Injection Molding Feedstock,” Tae Gon Kang, Seong Jin-Park, Sundar V. Atre, Randall M. German, PowderMet 2007, Denver, CO, May 13-16, 2007.
- “Postural Effects of Monocular Display Augmented Laser Digitizing,” N. Littell, K. Babski-Reeves, *10th Annual Applied Ergonomics Conference*, Dallas, TX, 2007.

- “Probabilistic Product-Process Design Optimization of Automotive Structures using Multiscale Material Models,” E. Acar, K. Solanki, M. Rais-Rohani, M.F. Horstemeyer, The 14th Asia Pacific Automotive Engineering Conference, August 5-8, 2007.
- “Reliability of Mechanistic Multistage Fatigue Model for Damage and Life Estimations,” Y. Xue, K. Solanki, G. Steele, M.F. Horstemeyer, AIAA, March, 2007.
- “Simulation of Binder-Powder Separation in Powder Injection Molding,” Seongjai Kim, Seong Jin Park, Sundar V. Atre, Randall M. German, PowderMet 2007, Denver, CO, May 13-16, 2007.
- “Study of Liquid-Phase Sintered, Nanosized Silicon Carbide Fabricated in a Plasma Pressure Compaction System,” Manish Bothara, Sundar V. Atre, Seong Jin Park, Randall M. German, T.S. Sudarshan, R. Radhakrishnan, PowderMet 2007, Denver, CO, May 13-16, 2007.
- “Thermal Expansion and Viscoelastic Properties of Sintered Porous Compact,” A. Antonyraj, Seong Jin Park, Randall M. German, PowderMet 2007, Denver, CO, May 13-16, 2007.
- “Thermal Modeling and Experimental Validation in the LENSTM Process,” L. Wang, S. Felicelli, J.E. Craig, P.T. Wang, M.F. Horstemeyer, The Eighteenth Solid Freeform Fabrication Symposium, Austin, TX, August 6-8, 2007.
- “Transient Oxidation in Alumina-Forming Alloys,” H. El Kadiri, M.F. Horstemeyer, MS&T, Detroit, MI, September, 2007.
- “Uncertainty-Based Internal State Variable Modeling of Structure-Property Relationships in Deformed Microstructures,” K. Solanki, M.F. Horstemeyer, The 5th International Conference on Materials Processing Defects, Cornell Center for Materials Conference, July, 2007.

E. Patents (disclosures or applications)

- “Computational Training System: InSite Studio,” Debbie Brown, Allan Bullwinkel, Jay Cain, Scott Calhoun, Daniel Hamilton, Trent Miskelly, Kellie McCarter, Zach Rowland, Hui Xian, 06-1027-250.
- “An Engine Speed Controller with Total System Integration for On-Board Vehicle Power Applications,” Marshall Molen, Angela Card, 07-0129-272.
- “Method and Apparatus for Testing Toy Bumper Designed for Increased Passenger Safety Using Newton’s Law of Motion (revised),” Mark Horstemeyer, Rosemary Cuicchi, Paul Cuicchi, Stephen Horstemeyer, 07-0215-280.
- “One-Step Continuous TRIP-like and Temper-like LENS Processes for Metallic Alloys Based Components with Pre-controlled Properties,” Paul Wang, Haitham El Kadiri, 07-0219-283.
- “Horizontally Adjustable Pedal Assembly,” Jihun Kang, John McGinley, Ron Lewis, 07-0309-290.
- “Atomistic Sintering Simulation Software,” Seong-Gon Kim, Sungho Kim, Mark Horstemeyer, Randall German, Seong Jin Park, 07-1231-274.

F. Proposal Submission

(Note: Only proposals submitted through Sponsored Programs Administration were counted.)

- “Ballistic Impact Dynamic Modeling of Fabric for New Protection Systems,” Paul Wang, Mark Horstemeyer, Gabriel Potirniche, CAE Solutions Corporation.
- “Business Continuity and Risk Assessment Tool Development,” Clay Walden, MS Technology Alliance.
- “CSR-PDOS: Efficient Scheduling Techniques for Evolving Applications,” Tomasz Haupt, National Science Foundation.
- “Determination of the Grain/Pore Size Distribution of Sintered Metals from Viscoelastic Data,” Randall German, Seong-Jin Park, Antonyraj Arockiasamy, National Science Foundation.
- “Disaster Management and Simulation System (DMS),” Tomasz Haupt, Amcom Express.
- “Feasibility Study – Design and Rendering Support for An Amphibious Craft,” Neil Littell, EBICS Technologies, LLC.
- “Feasibility Study for Employing Composite/Lightweight Materials,” Mark Horstemeyer, Amcom Express.
- “FSSIM: Task 1: Tools for Quantitative Analysis of the Simulation Results,” Tomasz Haupt, Naval Research Lab.
- “FSSIM: Task 2: Support of Fire Curtains for Archways,” Tomasz Haupt, Naval Research Lab.
- “FSSIM: Task 3: Support for Interactive Changing of Compartments Usetype and Fuel Loads,” Tomasz Haupt, Naval Research Lab.
- “General Dynamics Robotics Systems,” Mark Horstemeyer, Randall German, General Dynamics.
- “High Density Power Supplies Using Silicon Carbide,” Paul Martin, SemiSouth Laboratories, LLC.
- “Inbound Logistics Analysis for Auto Assembly Sites,” Clay Walden, Burak Eksioglu, Li Zhang, Mingzhou Jin, Sandra Eksioglu, MS Department of Transportation.
- “Investigation of the Effects of Increased Coverage Area or Soft Body Armor,” Kari Babski-Reeves, Daniel Carruth, John McGinley, Lawrence Technological Institute.
- “KUSCO Workshop for Scientific Issues on Medical Application of Micro/Nano Powder Injection Molding-Molding, Sintering, Modeling and Commercial Applications,” Randall German, Seong-Jin Park, KUSCO.
- “Manufacturing Support for Continuing Manufacturing Plan (CMP) and Prototype Build in the West Point Facility,” Glenn Dennis, Griffin, Inc.
- “Modeling Improvements for Warhead Design,” Mark Horstemeyer, Gabriel Potirniche, Paul Wang, CAE Solutions Corporation.
- “Nanoparticulate Building Blocks for 3-D Ceramic Microfabrication Using Powder Injection Molding,” Randall German, Seong-Jin Park, Seong-Gai Kim, National Science Foundation.
- “Outbound Logistics Extension,” Clay Walden, Burak Eksioglu, Mingzhou Jin, Sandra Eksioglu, MS Department of Transportation.
- “Portal-Based OpenSees Interface,” Tomasz Haupt, University of California at San Diego.
- “Process Improvement Support at Faurecia in Cleveland, MS,” Clay Walden, Robert Sheely, Entergy Services, Inc.
- “Process Improvement Support at Faurecia in Cleveland, MS,” Clay Walden, Robert Sheely, MS Development Authority.
- “Production System Modeling and Decision Support,” Clay Walden, Allen Greenwood, Amcom Express.

- “Run-Flat Modeling and Simulation Project,” Zach Rowland, Paul Wang, Amcom Express.
- “Six Sigma Kaizen Events at PFG Optics in Ocean Springs, MS,” Clay Walden, Robert Sheely, MS Technology Alliance.
- “Structural Analysis for Drop Deck Trailer,” Glenn Dennis, Wade Services, Inc.
- “Tardec 8.0 Physics-Based Reliability Model for PM/LENS & Baseline Products,” Mark Horstemeyer, Paul Wang, National Automotive Center.
- “Validation of Optimization-Based Formulations and Performance of Dynamic Human Models: A Comparison of Real and Simulated Design Assessments,” Zach Rowland, John McGinley, Gary McFadyen, Kari Babski-Reeves, Daniel Carruth, University of Iowa.

II. Outcomes

A. Publications

- “A Microstructural Model for Feedstock Homogeneity,” S.V. Atre, P. Suri, C. Scott, J.A. Thomas, R.M. German, *PIM Compilation I: Powders, Binders and Feedstocks*, Metal Powder Industries Federation, Princeton, NJ, 2007 (on CD).
- “A Non-Convex Diffusion Model for Simultaneous Image De-noising and Edge Enhancement,” S. Kim, H. Lim, *Electronic Journal of Differential Equations*, Conference Special Issue 15, pp. 175-292.
- “Bi-Material Components Using Powder Injection Molding: Densification, Shape Complexity, and Performance Attributes,” R.M. German, D.F. Heaney, J.L. Johnson, *PIM Compilation II: Molding, Debinding and Sintering*, Metal Powder Industries Federation, Princeton, NJ, 2007 (on CD).
- “Binder Selection for PIM of Water Atomized 316L,” N. Myers, R.M. German, *PIM Compilation I: Powders, Binders and Feedstocks*, Metal Powder Industries Federation, Princeton, NJ, 2007 (on CD).
- “CAE-Based Process Design of PIM for Microfluidic Device Components,” Roshan Urval, Carl Wu, Sundar V. Atre, Seong-Jin Park, Randall M. German, *PIM International*, Vol. 1, No. 1, pp. 53-58, March, 2007.
- “Development of Niobium Powder Injection Molding. Part II: Debinding and Sintering,” G. Aggarwal, I. Smid, S.J. Park, R.M. German, *International Journal of Refractory Metals and Hard Materials*, 2007, vol. 25, pp. 226-236.
- “Development of Niobium Powder Injection Molding: Part II, Debinding and Sintering,” G. Aggarwal, S.J. Park, I. Smid, R.M. German, *International Journal of Refractory Metals and Hard Materials*, Volume 25, Issue 3, 2007, Pages 226-236.
- “Effect of Die Compaction Pressure on Densification Behavior for Molybdenum Powders,” P. Garg, S.J. Park, R.M. German, *International Journal of Refractory Metals & Hard Materials*, Volume 25, Issue 1, January, 2007, Pages 16-24.
- “Effect of Mixing on the Rheology of Alumina Feedstocks,” P.V. Suri, S.V. Atre, R.M. German, *PIM Compilation I: Powders, Binders and Feedstocks*, Metal Powder Industries Federation, Princeton, NJ, 2007 (on CD).
- “Environmental Effects on the Mechanical and Thermomechanical Properties of Aspen Fiber-Polypropylene Composites,” Y.Xue, D.R. Veazie, C.Glinsey, M.F. Horstemeyer, R.M. Rowell, *Composites B: Engineering 2007*; 38, pp. 152-58.

- “High-order Schemes for Acoustic Waveform Simulation,” S. Kim, H. Lim, *Applied Numerical Mathematics*, vol. 57, No. 4, pp. 402-414, 2007.
- “Homogeneity of Powder-Binder Mixtures: A Microstructural Model,” P. Suri, S.V. Atre, J.A. Thomas, K. Sghaier, R.M. German, *PIM Compilation I: Powders, Binders and Feedstocks*, Metal Powder Industries Federation, Princeton, NJ, 2007 (on CD).
- “*In Situ* Monitoring of the Dimensional Changes and Mechanisms During Solvent Debinding,” E.J. Westcot, C. Binet, R.M. German, *PIM Compilation II: Molding, Debinding and Sintering*, Metal Powder Industries Federation, Princeton, NJ, 2007 (on CD).
- “*In Situ* Noncontact Monitoring of Powder Compacts during Polymer Removal,” R.C. Koseki, C. Binet, R.M. German, *PIM Compilation II: Molding, Debinding and Sintering*, Metal Powder Industries Federation, Princeton, NJ, 2007 (on CD).
- “Influence of Process Parameters on the Phase Transformation and Consequent Hardness Induced by the LENS Process,” L. Wang, S. Felicelli, *Materials Processing Fundamentals*, edited by P. Anyalebechi, TMS (The Minerals, Metals & Materials Society), 2007, pp. 63-72.
- “Injection Molding and Sintering of Large Components,” J.C. LaSalle, S.K. Das, B. Snow, B. Chernyavsky, M. Goldenberg, D. Blaine, R.M. German, *PIM Compilation II: Molding, Debinding and Sintering*, Metal Powder Industries Federation, Princeton, NJ, 2007 (on CD).
- “Micromechanisms of Multitape Fatigue Crack Growth in a High Strength Aluminum Alloy,” Y. Xue, H. El Kadiri, M.F. Horstemeyer, J. B. Jordon, H. Weiland, *Acta Materialia*, Volume 55, Issue 6, April, 2007, Pages 1975-1984.
- “Microstructure-Based Multistage Fatigue Modeling of Cast AE44 Magnesium Alloys,” Y. Xue, M.F. Horstemeyer, D.L. McDowell, H. El Kadiri, J. Fan, *International Journal of Fatigue* 2007; 29, pp. 666-676.
- “Modeling the Onset and Evolution of Hydrogen Pores During Solidification,” S. Felicelli, C. Pita, E. Escobar de Obaldia, *Shape Casting: The 2nd International Symposium*, edited by P. Crepeau, M. Tiryakioglu, J. Campbell, TMS (The Minerals, Metals & Materials Society), 2007, pp. 201-208.
- “Modified Embedded-Atom Method Interatomic Potentials for the Mg-Al Alloy System,” B. Jelinek, J. Houze, Seong-Gon Kim, M. Horstemeyer, M. Baskes, Sungho Kim, *Physical Review B* 75(5), pp. 054106, 2007.
- “Non-Convex Diffusion Model for Simultaneous Image Denoising and Edge Enhancement,” S. Kim, H. Lim, *Electronic Journal of Differential Equations*, vol. 15, pp. 175-192, 2007.
- “Numerical Methods for Viscous and Nonviscous Wave Equations,” H. Lim, S. Kim, J. Douglas, Jr., *Applied Numerical Mathematics*, v. 57, No. 2, pp. 194-212.
- “Numerical Simulation of the Temperature Distribution and Solid-Phase Evolution in the LENS Process,” L. Wang, S. Felicelli, Y. Gooroochurn, P.T. Wang, M.F. Horstemeyer, *Proceedings of SFF 2006 – 17th Solid Freeform Fabrication Symposium*, Austin, TX, August, 2006, pp. 453-463.
- “Powders, Binders and Feedstocks for Powder Injection Molding,” Randall M. German, *PIM International*, Vol. 1, No. 1, pp. 34-39, March 2007.
- “Quantitative Analysis of Thermal Debinding,” S. Atre, R.M. German, *PIM Compilation II: Molding, Debinding and Sintering*, Metal Powder Industries Federation, Princeton, NJ, 2007 (on CD).
- “Spotlight on Research - Law Enforcement Research Initiative,” M. Thomas, D. Carruth, *CAVS Website*, 2007.

- “The Effect of Powder Loading on Dimensional Variability in PIM,” R. Zauner, D.F. Heaney, J.C. Piemme, C. Binet, R.M. German, *PIM Compilation I: Powders, Binders and Feedstocks*, Metal Powder Industries Federation, Princeton, NJ, 2007 (on CD).
- “The Effect of Powder Type and Powder Size on Dimensional Variability in PIM,” R. Zauner, D.F. Heaney, J.C. Piemme, C. Binet, R.M. German, *PIM Compilation I: Powders, Binders and Feedstocks*, Metal Powder Industries Federation, Princeton, NJ, 2007 (on CD).
- “The Method of Diffusion Modulation for the Restoration of Image Fine Structures,” D.N. Kim, J. Choi, S. Kim, *WSEAS Transactions Mathematics*, v. 6, No. 2, pp. 361-368.
- “Tradeoff of Uncertainty Reduction Mechanisms for Reducing Structural Weight,” E. Acar, R.T. Haftka, T.F. Johnson, *ASME Journal of Mechanical Design*, Vol. 129, No. 3, 2007, pp. 266-274.
- “What is Micro PIM?,” Conference Report: Powder injection molding at the PM2006 World Congress, Busan, Korea, *PIM International*, Vol. 1, No. 1, pp. 40-44, March 2007, from the paper : S. V. Atre, Carl L. Wu, C. J. Hwang, R. Zauner, S. J. Park, and R. M. German, ‘Technical and Economical Comparison of Micro Powder Injection Molding,’ *PM 2006 POWDER METALLURGY World Congress*, B02-02-4, pp. 45-46, Busan, Korea, 2006.

B. Presentations

- “A Study of Monotonic and Cyclic Properties of Lens Fabricated 4140 and AISI 4140 Steel Alloys,” G. P. Potirniche, J. Middleton, R. Gomez, B. Bain, H. El Kadiri, H. Rhee, N. Williams, P. Wang, M. F. Horstemeyer, Materials Processing and Manufacturing Division Symposium, The Minerals, Metals & Materials Society, March, 2007.
- “Application of the Artificial Intelligence Techniques in Modeling the Microstructure-Property Relationships of Materials,” O. AbuOmar, R. Yassar, E. Hansen, K. Stolting, 136th TMS Annual Meeting, Orlando, FL, February 25-28, 2007.
- Canton Career Schools, *Advisory Committee* for Industrial Technology Program, Canton, February 20, 2006, invited.
- CAVS Extension, *Energy Management* meeting Energy Plan review, Canton, March 30, 2007, submitted.
- “Decision Support System for Shop Capacity Planning Across Multiple Shipyards,” Philip Culver, Travis Hill, Jeff Miller, Joshua Welch, Clay Walden, Greg Dobson, Bob Coates, ShipTech 2007, submitted.
- “Design and Performance of the Mississippi State Challenge X Hybrid Electric Vehicle,” D. Oglesby, M. Molen, C. Whitt, K. Walp, K. Crawford, SAE Hybrid Vehicle Technologies Symposium, San Diego, CA, February 7-8, 2007.
- “Development of Material Models for Automobile Glasses,” T.E. Lacy, Y. Hwang, K. Solanki, Nissan NTCNA, March 20-21, 2007.
- “Influence of Process Parameters on the Phase Transformation and Consequent Hardness Induced by the LENS Process,” L. Wang, S. Felicelli, TMS (The Minerals, Metals & Materials Society) - 2007 Annual Meeting and Exhibition, Orlando, FL, February 26 – March 1, 2007.
- “InSite Suite,” J. Scott Calhoun, Neonatal Development Care, Hattiesburg, MS, January 11, 2007.

- “InSite Suite,” Matthew Bennett, Debbie Brown, Jay Cain, J. Scott Calhoun, Kelli McCarter, Melissa Riddle, Hui Xian, Pearl River Community College, Poplarville, MS (via GoToMeeting.com), March 9, 2007.
- “InSite Suite,” J. Scott Calhoun, Advanced Dental Technologies, Richmond, VA (via GoToMeeting.com), March 9, 2007.
- “InSite Studio Design Review,” Matthew Bennett, Debbie Brown, Jay Cain, J. Scott Calhoun, Kelli McCarter, Melissa Riddle, Hui Xian, East Mississippi Community College, March 7, 2007.
- “InSite Studio,” Debbie Brown, J. Scott Calhoun, Kelli McCarter, Naval Air Warfare Center Training Systems Division, Orlando, FL (via GoToMeeting.com), February 1, 2007.
- “Internal State Variable Modeling of Structure-Property Relationships in Deformed Microstructures,” M.F. Horstemeyer, K. Solanki, The Minerals, Metals, and Materials Society, 2007 TMS Annual Meeting & Exhibition, Orlando, FL, February 25 – March 1, 2007.
- “Kaizen Team Results: Integration of Weld and Assembly within Standard Backs,” Clay Walden, Travis Hill, Faurecia, Cleveland, MS, February 15, 2007, invited.
- “Kaizen Team Results: Reduction of Defects in Prism Fabrication,” PFG Optics, Clay Walden, Ocean Springs, MS, March 30, 2007, invited.
- “Linkage Between Atomistic and Continuum-Based Simulations in Nanoscale Powder Metallurgy,” Amitava Moitra, Sungho Kim, Seong-Gon Kim, Seong Jin Park, Randall M. German, 2007 TMS Annual Meeting & Exhibition, Orlando, FL, February 25-March 1, 2007.
- “Linkages Between Atomistic and Continuum-Based Simulations in Nanoscale Powder Metallurgy,” Amitava Moitra, Sungho Kim, Seong-Gon Kim, Seong Jin Park, Mark Horstemeyer, Randall M. German, Advances in Computational Materials Science and Engineering Methods Symposium, 136th Annual Meeting, The Minerals, Metals, and Materials Society, Orlando, FL, February 27, 2007.
- “Low-Cost Distributed Learning for Workforce Training,” J. Scott Calhoun, Melissa Riddle, Cochran Congressional Staff at CAVS, March 31, 2007.
- Madison County Business & Commerce, *Advisory Committee* for Industrial Technology Program, Canton, February 14, 2007, invited.
- “Microstructural-Property Characterization of a Dodge Neon Passenger Car,” I. Carrasquel, M.F. Horstemeyer, K. Solanki, C. Burton, Escape Conference, GSA (Graduate Student Association) Symposium, MSU, March 30, 2007.
- “Mississippi Test Track Proposal,” G. Dennis, to Nick Ardillo and Andy Taggart of Ardillo, McCullough & Taggart, LLC (AMT), March 28, 2007.
- “Modeling the Onset and Evolution of Hydrogen Pores during Solidification,” S. Felicelli, C. Pita, E. Escobar de Obaldia, TMS (The Minerals, Metals & Materials Society) - 2007 Annual Meeting and Exhibition, Orlando, FL, February 26 – March 1, 2007.
- “Modification of Wood Flour Surfaces by Esterification with Acid Chlorides: Use in HDPE/Wood Flour Composites,” Y. Zhang, C.U. Pittman Jr., H. Toghiani, Y. Xue, ACS Conference, Chicago, IL, March, 2007.
- “Multiscale Analysis of a Magnesium Corvette Engine Cradle,” D. Oglesby, M.F. Horstemeyer, Mississippi Academy of Sciences (MAS) Annual Meeting, Starkville, MS, February 22, 2007.
- “On the In-Grain Orientation Gradient Development in Precipitation Hardening Aluminum Alloys,” R. Yassar, J. Baird, M.F. Horstemeyer, P.T. Wang, D. Field, K. Stolting, J. Murphy, 136th TMS Annual Meeting, Orlando, FL, February 25-28, 2007.

- “Post Katrina Response at Northrop Grumman Ship Systems Using Modeling and Simulation,” Charles LaRue, Travis Hill, Jeff Miller, Joshua Welch, Clay Walden, Greg Dobson, Bob Coates, ShipTech 2007, submitted.
- “Powder Injection Molding Research and Development,” R.M. German, invited presentation, 2007 International Conference on Powder Injection Molding, Metal Powder Industries Federation, Lake Buena Vista, FL, February 22, 2007.
- “RBDO of Automotive Structures for Improved Crashworthiness,” M. Rais-Rohani, K. Solanki, E. Acar, C. Eamon, TMS 2007 Annual Meeting and Exhibition in Orlando, FL, February 25 – March 1, 2007.
- “Recent Progress on Modeling Laser Engineering Net Shape (LENS) Process and Product Performance,” P.W. Wang, H. El Kadiri, G. Potirniche, M. F Horstemeyer, S. Felicelli, L. Wang, TMS Annual Meeting & Exhibition, Symposium on Advances in Microstructure-Based Modeling and Characterization of Deformation Microstructures, Orlando, FL, February 25 – March 1, 2007.
- “Reliability-Based Design Optimization of Automotive Structures for Improved Crash Performance,” M. Rais-Rohani, presented at TMS 2007 Annual Meeting, Orlando, FL, February 25-March 1, 2007.
- “Reliability-Based Optimization Using Multiscale Modeling,” E. Acar, Detroit, MI, February 6, 2007.
- “Review of CAVS Extension Participation in MEP.ms 2006-2007,” Clay Walden, NIST Panel Review, Mississippi Technology Alliance, Ridgeland, MS, March 27, 2007, invited.
- “Rolling History Microstructural Analyses of Texture Gradients for 6022 Aluminum Sheet,” C. Burton, M.F. Horstemeyer, P.T. Wang, R. Yassar, 136th TMS Annual Meeting, Orlando, FL, February 25-28, 2007.
- “Strain Rate Effects on the Microstructure-Property Relations of 6022 Rolled Aluminum Sheet,” C.L. Burton, M.F. Horstemeyer, P.T. Wang, R. Yassar, H. El Kadiri, 2007 TMS Annual Meeting, Orlando, FL, February 25 - March 1, 2007.
- “State-of-the-Art CAD Practices at CAVS MSU,” Z. Rowland, N. Littell, Canton, MS, 2007.
- “The MSU Challenge X Student Experience,” A. McAlpin, Mississippi Academy of Science, MSU Campus, 2007.
- “Transformations in Laser Multi-Deposited Medium Carbon Steel,” H. El Kadiri, L. Wang, S. Felicelli, M.F. Horstemeyer, P.T. Wang, TMS Annual Meeting & Exhibition, Symposium on Advances in Microstructure-Based Modeling and Characterization of Deformation Microstructures, Orlando, FL, February 25 – March 1, 2007.
- “University Spin-Off Companies: The Need for Rational Matches of the Inside and Outside Environments,” R.M. German, invited presentation, Intellectual Property in Materials Science: Patents, Tech Transfer and Licensing Symposium, 136th Annual Meeting, The Minerals, Metals, and Materials Society, Orlando, FL, February 26, 2007

C. Grant and Proposals

1.Submitted Proposals Awarded – Totaling \$4,669,576

- “Ballistic Impact Dynamic Modeling of Fabric for New Protection Systems,” Paul Wang, Mark Horstemeyer, Gabriel Potirniche, CAE Solutions Corporation, \$50,979.

- “Business Continuity and Risk Assessment Tool Development,” Clay Walden, Mississippi Technology Alliance, \$9,750.
- “Center for Virtual Design and Manufacturing,” Mark Horstemeyer, Paul Wang, Steven Elder, Hyeona Lim, Charles Campbell, John Berry, Philip Gullett, Thomas Lacy, Sergio Felicelli, Seong-Gon Kim, Steven Daniewicz, Battelle, \$2,376,000.
- “Feasibility Study – Design and Rendering Support for An Amphibious Craft,” Neil Littell, EBICS Technologies, LLC, \$49,973.
- “High Density Power Supplies Using Silicon Carbide,” Paul Martin, SemiSouth Laboratories, LLC, \$340,902.
- “Inbound Logistics Analysis for Auto Assembly Sites,” Clay Walden, Burak Eksioglu, Li Zhang, Mingzhou Jin, Sandra Eksioglu, MS Department of Transportation, \$131,000.
- “Joint Contingency Operations Base (JCOB) – Task Order 2,” Dave Coltharp, Sentel Coporation, \$33,500.
- “Joint Test and Evaluation Quick Reaction Test (QRT) Engineering, Test, and Analysis Support – Task Order 1,” Dave Coltharp, Sentel Corporation, \$168,236.
- “Mississippi State Community Action Teams (MSCA) Excellence in Engagement Proposal,” Mark Horstemeyer, U.S. Small Business Administration, \$50,000.
- “Process Improvement Support at Faurecia in Cleveland, MS,” Clay Walden, Robert Sheely, Mississippi Development Authority and Entergy Services, Inc., \$35,000.
- “REU Site: Multiscale High Rate Phenomena,” Philip Gullett, Tommy Stevenson, National Science Foundation, \$101,416.
- “Six Sigma Kaizen Events at PFG Optics in Ocean Springs, MS,” Clay Walden, Robert Sheely, Mississippi Technology Alliance, \$8,000.
- “Six Sigma Kaizen Events at PFG Optics in Ocean Springs, MS,” Clay Walden, Robert Sheely, PFG Optics, \$2,000.
- “Validation of Optimization-Based Formulations and Performance of Dynamic Human Models: A Comparison of Real and Simulated Design Assessments,” Zach Rowland, John McGinley, Daniel Carruth, Kari Babski-Reeves, Gary McFadyen, University of Iowa, \$1,162,820.
- “Vehicle Performance Monitoring System (VPMS) for Data Acquisition,” Zach Rowland, MS Department of Transportation, \$150,000.

2. Continuations – Totaling \$5,159,988

- “Advanced Power Distribution Prototyping, Evaluation and Simulation,” Zach Rowland, U.S. Army Space and Missile Defense Command, \$1,400,000.
- “Analysis of Mississippi’s Intermodal Transportation Infrastructure Relative to Prospective Sites of Automotive Assembly Plant Sites,” Clay Walden, Burak Eksioglu, Mingzhou Jin, Sandra Eksioglu, MS Department of Transportation, \$141,000.
- “Develop Macroscale Model for Metal PM Alloys,” Mark Horstemeyer, Haitham El Kadiri, John Berry, Paul Wang, Sergio Felicelli, National Automotive Center, \$3,269,998.
- “Manufacturing Support for Continuing Manufacturing Plan (CMP) and Prototype Build in the West Point Facility,” Glenn Dennis, Griffin, LLC, \$348,990.

D. Participation

- D. Norman, participated in the Aerospace Roundtable, Moss Point, MS, January 18, 2007. Hosted by Mississippi Gulf Coast Alliance for Economic Development.
- D. Norman, attended the Jones County Junior College Economic and Technology Symposium: Growth Opportunities I59 Technology Corridor, January 25, 2007, Ellisville, MS.
- D. Norman, attended Career Pathways Advisory Task Force, Kick – Off Meeting, February 5, 2007, Edison Walthall Hotel, Jackson, MS.
- D. Norman, met with Bill Rayburn, CEO FNC Inc., to discuss concepts for Technology Based Economic Development in Mississippi, February 7, 2007, CAVS Extension.
- D. Norman, hosted representatives from Atlas Mfg, Engineer Research & Development Center (ERDC), MSU SimCenter, to discuss design project for Atlas Traveling Screens, February 9, 2007, CAVS Extension.
- D. Norman, briefed MDA on concept for a test track near West Point, MS, February 13, 2007, CAVS Extension.
- D. Norman, attended meeting at Faurecia to discuss results of Kaizen events, February 14. 2007, Cleveland, MS.
- D. Norman, met with President of Diversified Technology to discuss a Business Assessment project, March 8, 2007, Ridgeland, MS.
- D. Norman, developed and hosted a meeting to discuss “Blast and Penetration Resistant Materials,” attendees included representatives from: Griffin Inc., ERDC, and CAVS, March 19, 2007, CAVS MSU.
- D. Oglesby and Challenge X Team, met with William Beggs, General Motors Challenge X mentor, CAVS, discussed MSU cX team status and preparation for competition, February 28-29, 2007.
- D. Oglesby, M. Molen, cX team, hosted Steve Gurski, Argonne National Laboratory, CAVS, Challenge X Pre-competition inspection, March 19, 2007.
- D. Oglesby, C. Whit, K. Walp, A. McAlpin, M. Molen, MSU Challenge X Vehicle was invited to be displayed at the SAE Hybrid Vehicle Technologies Symposium, San Diego, CA, February 7 – 9, 2007.
- E. Marin, P.T. Wang; visit to Auto Steel Partnership, Detroit; presented “Hydroforming Modeling and Constitutive Equation Development,” February 21, 2007.
- G. Dennis, invited to visit Plasan SASA in Israel January 23 – 29, 2007 with Victor Bertl, International Truck and Engine Engineering and Paul VanGilder, Director of Engineering for Griffin, Inc. The purpose of the visit was to understand the vehicle design and to develop the manufacturing and tooling plan in order to build MRAP vehicles in West Point.
- G. Dennis, invited to visit Plasan SASA in Israel February 9 – 16, 2007 with Kris Beutel, International Truck and Engine Engineering and Paul VanGilder, Director of Engineering for Griffin, Inc. The purpose of the visit was to influence vehicle design for manufacturability to further develop the manufacturing and tooling needed to build MRAP vehicles in West Point.
- G. Dennis, invited to a meeting with Sheryl Couch, Metal and Metal Fabricators Branch of Environmental Permits Division, Mississippi Department of Environmental Quality (MDEQ) along with Dr. J.C. Craig of Craig Chemical Management Systems and Paul F. Lynes, of Paul Lynes, LLC in Jackson, MS, March 23, 2007. Presented the manufacturing plan for additional paint booths necessary for the West Point facility to produce MRAP vehicles.

- J. Scott Calhoun, InSite Suite booth at Sixth Annual Army Training Simulation Conference Workshop, Williamsburg, VA.
- M. Molen, C. Whitt, M. Young, R. Williams, Challenge X Winter Workshop, January 31 – February 3, 2007, Austin, TX.
- M.F. Horstemeyer, P. Wang, W. Causey, D. Oglesby, et. al., NAC visitors CAVS tour, January 31, 2007.
- P. Wang, W. Causey, D. Oglesby, et. al., USAMP visitors CAVS tour, March 6, 2007.
- P. Wang, E. Marin, S. Kim, E. Acar, discussed possible collaboration with ASP.
- R. Prabhu, E. Marin, M.F. Horstemeyer, poster presentation “Constitutive Modeling of Polymeric Materials,” Society of Plastic Engineers Meeting, Mississippi Chapter, March 06, 2007.
- R. Sheely, visited Faurecia’s plant in Cleveland, MS, February 14, 2007, to meet with Faurecia management and various stakeholders’ ref. results of the completed project in 2006 and proposed follow-on work for 2007. 2nd trip to Faurecia on March 26-27, 2007 with Clay Walden and Travis Hill to gather data for a proposed new plant layout and plant simulation modeling work that has been proposed to Faurecia. Seeking funding for this new project from Faurecia and the stakeholders.
- R. Sheely, attended briefing for Atlas Manufacturing at CAVS Extension, February 9, 2007, to meet with managers and engineers from Atlas, Lawrence County economic development person and engineers and scientists from ERDC in Vicksburg and the SimCenter at MSU, to discuss the need for design assistance at Atlas to comply with the Clean water Act in regard to minimizing impingement and entrapment of fish in the traveling screen product that Atlas manufactures and sells to industry.
- R. Sheely, attended follow-up meeting at ERDC in Vicksburg, March 23, 2007, with Atlas management and other attendees for a capabilities set of briefings and tours of the ERDC site.
- R. Sheely, attended the Spring Meeting of the Senior Executive Advisory Board [SEAB] of the College of Business and Industry [COBI] at MSU. Appointed as chair of the newly formed Development Committee of SEAB, a standing committee that will work with the COBI Development Officer and Dean to assist in fundraising and related projects.
- R. Sheely, hosted and met with COBI’s Young Alumni Advisory Group [YAAG] at CAVS Extension on March 16, 2007, discussing the activities of CAVS in supporting industry across Mississippi.
- R. Sheely, met with managers at Diversified Technology, Inc. [DTI] on 3 occasions: February 2, March 16 and March 19. Investigating Lean Manufacturing and other project areas where CAVS Extension may become engaged in an onsite project with DTI.
- R. Sheely, attended meeting at CAVS Extension, February 13, 2007, with Paul McKay, Chief Administrative Officer of the City of West Point, and Becky Thompson, Mississippi Development Authority, to discuss the prospect of a new Test Track in West Point for Griffin International, Nissan, MDOT and other Transportation related organizations.
- R. Sheely, attended the following meetings:
- a. January 25: I-59 Corridor Economic Development Symposium at Jones County Junior College’s Advanced Technology Center.
 - b. February 8: Meeting at CAVS Extension with Dr. Randy Goldsmith, President of the Mississippi Technology Alliance
 - c. February 23: Meeting of the Mississippi Department of Education’s [MDE] Career Pathways Oversight Committee [CPOC].

- R. Sheely, attended 3 days of Lean Manufacturing Training at CAVS Extension, March 20-23, 2007, as provided by MEP: “Value Stream Mapping [VPM] & “Total Productive Maintenance” [TPM].
- R. Sheely, attended SPA/BCoE Training for PI’s, February 15: “Policies and Procedures.
- S. Felicelli, trip to American Foundry Society headquarters (IL) to represent MSU in the QR meeting of project HI-MAC (High Integrity Magnesium Automotive Components), March 19-20, 2007.
- S.J. Park, Participated in “Teaching Seminar,” Mississippi State University, January 4-5, 2007.
- S.J. Park, hosted CAVS visit for Professors Myung-Won Suh and Taesung Kim, from Sung Kyun Kwan University, Korea, January 15-20, 2007. They will take part in NSF-ERC proposal with Dr. Mark Horstemeyer.
- S.J. Park, arranged four visiting students from Sung Kyun Kwan University, January 15-February 13, 2007. Taeyoon Koo, Seongho Ji, and Baeyoung Kim worked on Simulator and HMI (Human Machine Interface) and Sehoon Kim worked on optimization and reliability for automotive application.
- S.J. Park, arranged presentation for Mr. Donghun Lee, Ohio State University.
- S.J. Park, Arranged visiting professor Sayim Kang from Korean University, March 1-July 31, 2007.
- S.J. Park, arranged visiting student Mr. Taeyoon Koo from Sung Kyun Kwan University from March 1-August 31, 2007.
- T.E. Lacy, Y. Hwang, K. Solanki, Nissan NTCNA Autoglass project Meeting, Detroit, MI, March 20-21, 2007.
- V. Branch, attended the Lean Manufacturing Workshop, Bay St. Louis, MS, MEP University – February 26-28, 2007, participant.
- V. Branch, attended the Lean Manufacturing Workshop, Canton, MS, MEP University – March 20-22, 2007, participant.
- Y. Hammi, visit and presentation at Metaldyne Sintered Components, Ridgway, PA, January 18, 2007.

E. Recognition

- C. Walden, R. Sheely, V. Branch, T. Hill, L. Simmons, Certified Trainer from MEPU in the following Lean Manufacturing workshops: The 5S System for Workplace Organization, Total Productive Maintenance, Value Stream Mapping, Quick Changeover/Setup Reduction.
- D. Norman, nominated to serve on the Mississippi Department of Education, “Career Pathways Oversight Committee,” January 19, 2007.
- P. Gullett, 2007 Bagley College of Engineering, Faculty Research Award.
- R. Carino, nominated for initiation into Mississippi Alpha Chapter of Upsilon Pi Epsilon honor society in computer science, March 8, 2007.
- R. Sheely, elected as a Board Officer of CIT.ms on March 30, 2007. [CIT.ms is the Communications and Information Technology Organization of Mississippi, a “cluster” organization.]
- R.M. German and CAVS were featured in *Automotive Industries*, Volume 186, Issue 1.

- S.J. Park, "Leading Scientists of the World 2007" of the International Biographical Centre Elected as new IISS (International Institute for the Science of Sintering) member.
- T. Puz, Graduate Research Symposium 2007, Poster Competition, "Tungsten-Polymer Formulations," 3rd Place – Physical Science Section.

F. Service

- C. Walden, G. Dennis, Spring 2007 "Introduction to Six Sigma Methodology" Workshop Series, \$12,000 in workshop revenue.
- G. Potirniche – Editorial Board, Open Mechanical Engineer.
- P. Gullett, Chair – Solid Mechanics Working Group.
- N. Littell, judged regional science fair, February, 2007.
- R.S. Yassar, Session Chair - TMS Annual Meeting 2007, Symposium on Advances in Microstructure Based Modeling and Characterization of Deformed Microstructures, 2006.
- S. Felicelli, NSF Proposal Review Panel, Thermal Transport and Thermal Processing Program (CTS) and Materials Processing and Manufacturing Program (DMI), NSF Headquarters, Arlington, VA, January 4-5, 2007.
- S.G. Kim, Become, Inc., Mountain View, CA: consulting 10 days.
- S.J. Park, paper review, "Effect of Sintering Conditions on the Microstructural Parameters of W-Ni-Fe and W-Ni-Co Alloys," *Journal of Materials Science*, February, 2007.
- S.J. Park, paper review, "Rheology Study of Carbon Nanotube-Nanoparticle Dispersion Systems," *Journal of Materials Science*, March, 2007.
- S.J. Park, paper review, "Kinetic study of PVB thermal decomposition by thermo gravimetric analysis of injection molded samples," *Journal of the American Ceramic Society*, March, 2007.
- Y. Xue, reviewed paper for Fatigue and Fracture of Engineering Materials and Structures.

G. Other Activities

- D. Carruth, J. McGinley, C. Adams-Price, presentation and tour for Dr. Carolyn Adams-Price's Experimental Psychology students, February, 2007.
- D. Carruth, M. Thomas, T. Garrison, C. Blackledge, C. Williams, observation of Starkville Police Department, Mississippi State University Police Department, and Lowndes County Sheriff Department tactical team training with Christine Williams of MSU IRB., February, 2007.
- D. Carruth, J. McGinley, B. Robbins, T. Marler, A. Mathai, S. Rahmatalla, S. Beck, K. Abdel-Malek, visit to University of Iowa CCAD for VSR Program collaboration meeting including cognitive modeling review, motion validation planning, and Santos DHM software training, January, 2007.
- D. Norman, CAVS Extension training/workshops for approximately 236 people.
- D. Norman, hosted representatives from Mississippi Technology Alliance, MDA, L-3 Vertex, Atlas Mfg. & Hearin Foundation on a tour of ERDC, March 23, 2007, Waterways Experiment Station, Vicksburg, MS.

- D. Oglesby, Phone interview with Strauss Radio Company about MSU Challenge X, (40 affiliates and 400,000 listeners), January 30, 2007.
- D. Oglesby, C. Whitt, "Challenge X Progress Report #2," February 2, 2007.
- D. Oglesby, Displayed MSU Equinox at SAE Hybrid Vehicle Technologies Symposium San Diego, CA, February 7-8, 2007.
- E. Acar, M. Rais-Rohani, K. Solanki, "Reducing Computational Cost of Reliability Based Design Optimization by Using More Efficient Techniques," CAVS Report, MSU.CAVS.CMD.2007-R0002, February, 2007.
- E. Acar, "Increasing Allowable Flight Loads by Improved Structural Modeling," CAVS Report, MSU.CAVS.CMD.2007-J0001, March, 2007.
- G. Dennis, member of the team that toured personnel from the Defense Contract Management Agency (DCMA) through the Griffin Armor facility in West Point on February 5, 2007. Then presented the manufacturing plan for building MRAP vehicles at the site. This presentation and tour led to International/Griffin being awarded a contract to build four (4) test vehicles for the Marines to test at Aberdeen Proving Grounds (APG).
- H. Rhee, K.N. Subramanian, Outstanding Paper, Literati Club, 2007 Award for Excellence, "Role of Imposed Cyclic Strain Amplitude and Cyclic Strain Rate on the Stress Relaxation Behavior of Pre-strained Eutectic Sn-3.5Ag Solder Joints," Soldering and Surface Mount Technology, 18 (2006), p.19.
- N. Littell, hosted website use meeting and introduction to CAVS web tools, January, 2007.
- N. Littell, hosted CAVS website kickoff meeting, January, 2007.
- S. Groh, peer review for "Modeling and Simulation in Materials Science and Engineering."
- T.E. Lacy, Y. Hwang, K. Solanki, "Development of Material Models for Automobile Glasses," Nissan NTCNA, March 20-21, 2007.
- Y. Hammi, USAMP-PM Program Review Meeting with P/M partners presentation of "Program Overview" and "ISV Modeling."
- Y. Xue, Mg-Front-end research and development (MFERD) task team meeting – fatigue group, March 1, 2007.
- Y. Xue, hosted the hospitality reception for the MFERD technical steering meeting; prepared 9 posters to demonstrate the research capacities of CMD related to the MFERD project, February 28, 2007.
- Y. Xue, presented the ideas on fatigue modeling and microstructure of viscoelastic materials, March 20, 2007.