REBECCA B. DUPAIX

Curriculum Vitae
Feb 13, 2020

Department of Mechanical and Aerospace Engineering
E310 Scott Laboratory
201 West 19th Avenue
The Ohio State University
Columbus, OH 43210

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EDUCATION

2003 Ph.D., Mechanical Engineering, Massachusetts Institute of Technology
2000 M.S., Mechanical Engineering, Massachusetts Institute of Technology
1998 B.S., Mechanical and Aerospace Engineering, Utah State University

PROFESSIONAL APPOINTMENTS

2019-Present Professor, Department of Mechanical and Aerospace Engineering, The Ohio State University, Columbus, Ohio
2010-2019 Associate Professor, Department of Mechanical and Aerospace Engineering, The Ohio State University, Columbus, Ohio
2003-2010 Assistant Professor, Department of Mechanical Engineering, The Ohio State University, Columbus, Ohio

PUBLICATIONS

Books

2016 1. Dupaix, R.B. "Becoming a Finite Element Analyst: A Design-Model-Verify Approach", Cognella Academic Publishers.

Adopted by: Oregon State University, University of Texas-Dallas, Brigham Young University-Idaho

Refereed journal articles

(Names in capital letters are Dr. Dupaix's students)

2019 1. Calhoun, M., Chowdhury, S.S., Nelson, T., Lannutti, J., Dupaix, R.B., and Winter, J.O. "Effect of electrospun fiber mat thickness and support method on cell morphology", *Nanomaterials*, Vol. 9, No. 4

2019 2. Calhoun, M.A., BENTIL, S.A., Elliott, E., Otero, J.J., Dupaix, R.B., and Winter, J.O. "Beyond linear elastic modulus: viscoelastic mocels for brain and brain mimetic hydrogels", ACS Biomaterials Science & Engineering, Vol. 5, No. 8, pp. 3964-3973.

2019 3. MATHIESEN, D., KAKUMANI, A., and Dupaix, R.B. "Experimental Characterization and Finite Element Prediction of Large Strain Spring-back Behavior of Poly(methyl methacrylate)", *Journal of Engineering Materials and Technology-Transactions of the ASME,* Vol. 141, No. 3.

2018 4. MALLORY, A., Donnelly, B., Liu, J., Bahner, D., Moorhouse, K., and Dupaix, R.B., "Addressing Spatiotemporal Distortion of High-Speed Tissue Motion in B-Mode Ultrasound", *Biomedical Physics and Engineering Express,* Vol. 4, No. 5.

2018 5. BENTIL, S.A., and Dupaix, R.B. "Simulations of Hydrogel-coated Neural Microelectrodes to Assess Biocompatibility Improvement Using Strain as a Metric for Micromotion", *Biomedical Physics and Engineering Express,* Vol. 4, No. 3.

2014 6. MATHIESEN, D., VOGTMANN, D., and Dupaix, R.B. "Characterization and Constitutive Modeling of Stress-relaxation Behavior of Poly(methyl methacrylate) (PMMA) across the Glass Transition Temperature", *Mechanics of Materials*, Vol. 71, pp. 74-84.

2014 7. BENTIL, S.A., and Dupaix, R.B. "Exploring the Mechanical Behavior of Degrading Swine Neural Tissue at Low Strain Rates via the Fractional Zener Constitutive Model", *Journal of the Mechanical Behavior of Biomedical Materials,*Vol. 30, pp. 83-90.

2012 8. STAMMEN, J.A., Herriott, R., Kang, Y.-S., Dupaix, R.B., and Bolte, J. IV. "Dynamic Properties of the Upper Thoracic Spine-Pectoral Girdle (UTS-PG) System and Corresponding Kinematics in PMHS Sled Tests", *Stapp Car Crash Journal,* Vol. 56.

2012 9. Giriunas, K., Sezen, H., and Dupaix, R.B. "Evaluation, Modeling, and Analysis of Shipping Container Building Structures", *Engineering Structures,* Vol. 43, pp. 48-57.

2012 10. Rao, S.S., BENTIL, S., DeJesus, J., Larison, J., Hissong, A., Dupaix, R.B., Sarkar, A., and Winter, J.O. "Inherent Interfacial Mechanical Gradients in 3D Hydrogels Influence Tumor Cell Behaviors", *PLoS ONE,* Vol. 7, No. 4, e35852. doi:10.1371/journal.pone.0035852.

2012 11. SINGH, K., and Dupaix, R.B. "Hot Embossing Experiments of Polymethyl methacrylate (PMMA) across the Glass Transition Temperature with Variation in Temperature and Hold Times", *Polymer Engineering and Science,* Vol. 52, No. 6, pp. 1284-1292.

2012 12. CHANDRASEKARAN, G., and Dupaix, R.B. "Mechanical Behavior of a Series of Co Polyester Blends near the Glass Transition—Monotonic and Load-Hold Behavior", *International Journal of Polymer Science,* Article ID 245205. doi:10.1155/2012/245205.

2010 13. GHATAK, A. and Dupaix, R.B. "Material Characterization and Continuum Modeling of Poly (Methyl Methacrylate) (PMMA) above the Glass Transition",

International Journal of Structural Changes in Solids -Mechanics and Applications, Vol. 2, No. 1, pp. 53-63.

2010 14. Dupaix, R.B., and DAVIDSON HOSMER, J. "Mechanical Characterization and Finite Strain Constitutive Modeling of Electrospun Polycaprolactone under Cyclic Loading", *International Journal of Structural Changes in Solids -Mechanics and Applications*, Vol. 2, No. 1, pp. 9-17.

2009 15. Dupaix, R.B. and CASH, W. "Finite Element Modeling of Polymer Hot Embossing: Effects of Temperature on Springback and Residual Stress", *Polymer Engineering and Science*, Vol. 39, Iss. 3, pp. 531-543.

2008 16. Sparks, J. and Dupaix, R.B. "Constitutive Modeling of Rate Dependent Stress-Strain Behavior of Human Liver Tissue in Blunt Impact Loading", *Annals of Biomedical Engineering,* 36: 1883-1892.

2008 17. DULING, R., Dupaix, R.B., Katsube, N., and Lannutti, J. "Modeling and Characterization of Electrospun PCL: A Potential Scaffold for Tissue Engineering", *Journal of Biomechanical Engineering*, vol. 130, Iss. 1, Article Number: 011006.

2007 18. Sparks, J., Bolte, J.H. IV, Dupaix, R.B., Jones, K.H., Steinberg, S.M., Herriott, R., Stammen, J., and Donnelly, B. "Using Pressure to Predict Liver Injury Risk from Blunt Impact", *Stapp Car Crash Journal,* vol. 51, pp. 401-432.

2007 19. Dupaix, R.B. and Boyce, M.C. "Constitutive modeling of the finite strain behavior of amorphous polymers." *Mechanics of Materials* 39: 38-52.

2006 20. PALM, G., Dupaix, R.B., and Castro, J. "Large Strain Mechanical Behavior of Poly(methyl methacrylate) (PMMA) Near the Glass Transition Temperature." *Journal of Engineering Materials and Technology-Transactions of the ASME* 128(4): 559-563.

2006 21. Dupaix, R.B. and KRISHNAN, D. "A constitutive model for strain-induced crystallization in poly(ethylene terephthalate) (PET) during finite strain load-hold simulations." *Journal of Engineering Materials and Technology-Transactions of the ASME,* Vol. 128, pp. 28-33.

2005 22. Dupaix, R.B. and Boyce, M.C. "Finite strain behavior of poly(ethylene terephthalate) (PET) and poly(ethylene terephthalate)-glycol." *Polymer,* Vol. 46, pp. 4827-4838.

Conference proceedings

2017 1. Dupaix, R.B., Calhoun, M., BENTIL, S., and Winter, J.O. "Viscoelastic Modeling of Porcine Brain Tissue", *Proceedings of the 54th Annual Technical Meeting of the Society of Engineering Science*, Boston, MA, July 27-29.

2015 2. Dupaix, R.B. and MATHIESEN, D.S. "A Glass-Transition Constitutive Model for Polymethyl Methacrylate (PMMA) and its Ability to Predict Microchannel Hot Embossing Using Multi-Scale Finite Element Simulations", *Proceedings of the 52nd Annual Technical Meeting of the Society of Engineering Science*, College Station,

TX, October 26-28.

2015 3. Calhoun, M., Nelson, T., Lannutti, J., Winter, J., and Dupaix, R.B. "Inherent mechanical gradients influence cell behavior in electrospun fiber mats", *Abstracts of Papers of the American Chemical Society,* March.

2014 4. MALLORY, A., Herriott, R., Rhule, H., Kang, Y., Dupaix, R., and Liu, J. "High-Frequency B-Mode Ultrasound for the Measurement of Meningeal Motion During Head Rotation," *Proceedings of the 12th Annual Ultrasonic Transducer Engineering Conference*.

2014 5. MATHIESEN, D., and Dupaix, R.B. "Characterizing the Temperature Dependent Spring-Back Behavior of Poly(Methyl Methacrylate) (PMMA) for Hot Embossing," *Challenges in Mechanics of Time-Dependent Materials, Volume 2, Proceedings of the 2014 Conference on Experimental and Applied Mechanics*.

2014 6. Calhoun, M., Rao, S., BENTIL, S., Short, A., Nelson, T., Sarkar, A., Lannutti, J., Dupaix, R., and Winter, J. "The Influence of Mechanical Edge Effects in Multidimensional Cell Culture," *Proceedings of 7th Annual T2C Regenerative Wound Conference*.

2013 7. MATHIESEN, D., VOGTMANN, D., and Dupaix, R.B. "Stress-Relaxation Behavior of Poly (Methyl Methacrylate) (PMMA) Across the Glass Transition Temperature," *Challenges in Mechanics of Time-Dependent Materials and Processes in Conventional and Multifunctional Materials,* Vol 2, pp. 9-15.

2012 8. STAMMEN, J.A., Herriott, R., Kang, Y.-S., Bolte, J. IV, and Dupaix, R.B. "Sequential Biomechanics of the Human Upper Thoracic Spine and Pectoral Girdle," *Annals of the Advancement of Automotive Medicine*, Vol. 56, pp. 151-162, Seattle, WA, October 14-17.

2012 9. BENTIL, S.A. and Dupaix, R.B. "Factors that Influence the Mechanical Response of Degrading Swine Neural Tissue at Low Strain Rates", *Proceedings of the 49th Annual Technical Meeting of the Society of Engineering Science,* Atlanta, GA, October 10-12.

2012 10. BENTIL, S.A. and Dupaix, R.B. "Factors that influence the mechanical response of degrading swine neural tissue at low strain rates" *Proceedings of the 8th Annual Dayton Engineering Sciences Symposium*, Dayton, Ohio, October.

*S.A. BENTIL received a Best Presenter Award for this presentation.

2011 11. BENTIL, S.A. and Dupaix, R.B. "Unconfined Compression Tests of Degrading Swine Neural Tissue at Low Strain Rates", *Proceedings of the 48th Annual Technical Meeting of the Society of Engineering Science*, Evanston, IL, October 12-14.

2011 12. STAMMEN, J., Herriott, R., Moorhouse, K., Kang, Y., Dupaix, R.B., Bolte, J., Donnelly, B. "Isolated Segment Manipulation: A New Way to Characterize the Dynamic Response of Biomechanical Structures", *Proceedings OSU Injury Biomechanics Conference*.

2010 13. SINGH, K. and Dupaix, R.B. "Comparative Study Of Constitutive Models For Poly(methyl methacrylate) (PMMA) At Large Strains Near The Glass Transition",

Proceedings of the 2010 ASME International Mechanical Engineering Congress and Exposition, Vancouver, Canada, November 12-18.

2010 14. BENTIL,S.A., MACLEAN, S., and Dupaix, R.B. "Viscoelastic Properties of Macaque Neural Tissue and Low Strain Rates", *Proceedings of the 2010 ASME International Mechanical Engineering Congress and Exposition*, Vancouver, Canada, November 12-18.

2009 15. SINGH, K. and Dupaix, R.B. "Constitutive Modeling of Poly(methyl methacrylate) (PMMA) at Large Strains near the Glass Transition and its Application to Micro-Hot Embossing", *Proceedings of the 14th International Conference on Deformation, Yield and Fracture of Polymers*, pp. 293-296, Kerkrade, The Netherlands, April 6-9.

2008 16. Sparks, J.L. and Dupaix, R.B. "Constitutive modeling of rate dependent stress-strain behavior of human liver tissue in blunt impact loading," *Proceedings of the 45th Annual Technical Meeting of the Society of Engineering Science*, Champaign, IL, October 13-15.

2008 17. SINGH, K. and Dupaix, R.B. "Constitutive Modeling of Poly(methyl methacrylate) (PMMA) at Large Strains near the Glass Transition", *Proceedings of the 45th Annual Technical Meeting of the Society of Engineering Science*, State College, PA, October 13-15.

2007 18. Sparks, J.L. and Dupaix, R.B. "Constitutive modeling of rate dependent stress-strain behaviour of human liver tissue in blunt impact loading," *Proceedings of the 2nd International Conference on Mechanics of Biomaterials and Tissues*, Lihue, Kauai, Hawaii, December 9-13.

2006 19. Lannutti, J., Johnson, J., Reneker, D., Dupaix, R. and DAVIDSON, J. "Process-Property Interactions in Electrospun Nanofiber for Tissue Engineering Scaffolds", *Proceedings of Materials Science and Technology*, October.

2006 20. Dupaix, R.B., PALM, G., and Castro, J.M. "Large strain mechanical behavior of Poly(methyl methacrylate) (PMMA) near the glass transition temperature," *Proceedings of the 13th International Conference on Deformation, Yield and Fracture of Polymers*, pp. 267-270, Kerkrade, The Netherlands, April 10-13.

2006 21. Dupaix, R.B., PALM, G., and Castro, J. "Large strain mechanical behavior of poly(methyl methacrylate) (PMMA) near the glass transition". *Proceedings of the 43rd Annual Technical Meeting of the Society of Engineering Science*, State College, PA, August 14.

2006 22. DAVIDSON, J., Dupaix, R.B., Johnson, J., and Lannutti, J. "Modeling and Characterization of Electrospun PCL". *Proceedings of the 43rd Annual Technical Meeting of the Society of Engineering Science*, State College, PA , August 14.

2005 23. Dupaix, R.B. and DULING, R. "Mechanical Behavior of Electrospun Polycaprolactone (PCL) Fabric," *Proceedings of the McMat Joint Conference of Society of Engineering Science, ASME, and ASCE Mechanics and Materials Divisions*, Baton Rouge, LA, June.

2005 24. PALM, G.O., Dupaix, R.B., and Castro, J.M. "Large strain mechanical behavior of poly(methyl methacrylate) near the glass transition temperature," *Proceedings of the*

2005 ASME International Mechanical Engineering Congress and Exposition, Orlando, FL, November 5-11.

2004 25. Dupaix, R.B. and KRISHNAN, D. "A Constitutive Model for Strain-induced Crystallization in Poly(ethylene terephthalate) (PET) During Complex Loading to Finite Strains," *Proceedings of the 2004 ASME International Mechanical Engineering Conference and Exposition*, Anaheim, CA, November 19.

2004 26. KRISHNAN, D. and Dupaix, R.B. "Finite element modeling of reheat stretch blow molding of PET," *Proceedings of the 8th International Conference on Numerical Methods in Industrial Forming Processes*, pp. 228-232, Columbus, OH, June 16.

2004 27. Dupaix, R.B. "Modeling the finite strain behavior of poly(ethylene terephthalate) and poly(ethylene terephthalate)-glycol near the glass transition," *Proceedings of the 41st Annual Technical Meeting of the Society of Engineering Science*, Lincoln, NE , October 13.

2003 28. Dupaix, R.B. and Boyce, M.C., "Large strain constitutive modeling of poly(ethyelene terephthalate) and poly(ethylene terephthalate)-glycol," *Proceedings of the 12th International Conference on Deformation, Yield and Fracture of Polymers*, pp. 293-296, Cambridge, UK, April 7-10.

2003 29. Dupaix, R.B. and Boyce, M.C. "Large strain constitutive modeling of poly(ethylene terephthalate) and poly(ethylene terephthalate)-glycol above the glass transition," *Proceedings of the 40th Annual Technical Meeting of the Society of Engineering Science*, Ann Arbor, MI, October 13.

2003 30. Dupaix, R.B. and Boyce, M.C., "Large strain constitutive modeling of poly(ethylene terephthalate) and its application to reheat stretch blow molding" *Proceedings of the 2003 Mechanics and Materials Conference*, Phoenix, AZ, June 21.

2002 31. Brown, R.A. (Dupaix) and Boyce, M.C. "Constitutive Modeling of PET and PETG," *Proceedings of the American Chemical Society National Conference*, Orlando, FL, April 11.

Manuscripts in submission

Manuscripts in preparation

1. MATHIESEN, D., and Dupaix, R.B., "Multi-scale Finite Element Simulations of Micro Hot Embossing of PMMA".

2. WALTON, R., Chrstos, J., Schleppi, B., and Dupaix, R.B., "Influence of Roadway Micro Surface Texture on Macroscopic Friction Measurements".

3. BONAVITA, P., Dean, T., Khalil, W., Quach, T., Dupaix, B., and Dupaix, R.B., "Thermal analysis of heterogeneous integrated circuits incorporating GaN transistors—impact of packaging and boundary conditions on heat dissipation".

AWARDS

2014	Faculty Diversity Excellence Award, College of Engineering, Ohio State University
2011	Distinguished Alumni Award, Department of Mechanical and Aerospace Engineering, Utah State University
2008	Faculty Early Career Development Award (CAREER), the National Science Foundation
2008	Excellence in Teaching Award, Department of Mechanical Engineering Industrial Advisory Board, Ohio State University
2008	Above and Beyond Award, Pi Tau Sigma, Department of Mechanical Engineering, Ohio State University chapter
1999	National Science Foundation Graduate Research Fellowship

GRANTS

2018-2019	1. R.B. Dupaix, "DAGSI: Reconfigurable radio frequency (RF) technology for adaptable phased-array and cognitive electronic warfare (EW) applications: thermal management for heterogeneous integrated circuits", DAGSI and AFRL, $77,358. Grant.
2017-2018	2. R.B. Dupaix and J. Chrstos, "Track Surface Characterization," Ford (OSU-Ford Alliance), $221,618. Grant.
2017-2018	3. W. Khalil and R.B. Dupaix, "Agile/multifunction electronics," Wyle Laboratories/AFRL, $89,900. Contract.
2008-2015	4. R.B. Dupaix, "CAREER: Integrated approach to modeling, simulation, and design for manufacture of micro-hot embossing using a polymer glass transition modeling framework," National Science Foundation, Division of Civil, Mechanical, and Manufacturing Innovation, $399,999. Grant.
2008-2014	5. K. Jones, J.H. Bolte IV, and R.B. Dupaix, "Biomechanics of Trauma Research – Abdominal Trauma Study," National Highway Traffic and Safety Administration, $ 327,587. Contract.
2012-2013	6. M.E. Walter, R.B. Dupaix, "Honda Advanced Degree Program: Experimental characterization and computational modeling of fiber reinforced composites for automotive structural applications," Honda, $280,645. Grant.
2011-2013	7. J. Bolte, R.B. Dupaix, "Clavicle fractures due to belt loading in rear-seated adolescent occupants," Children's Hospital of Philadelphia, $17,652. Grant.
2011-2012	8. R.B. Dupaix, Graduate Research Diversity Supplement for Broadening Participation: Supplement for CAREER Award, The National Science

Foundation Award No. CMMI-0747252, $41,000. Grant.

2010-2011 9. R.B. Dupaix, Graduate Research Supplement for Broadening Participation: Supplement for CAREER Award, The National Science Foundation Award No. CMMI-0747252, $41,000. Grant.

2009-2010 10. R.B. Dupaix, Graduate Research Supplement for Broadening Participation: Supplement for CAREER Award, National Science Foundation, Division of Civil, Mechanical, and Manufacturing Innovation, $40,759. Grant.

2009-2010 11. R.B. Dupaix, "A methodology for determining human soft tissue properties in-situ ," Federal Highway Administration Award No. DDEGRF-09-X-00503, $32,400. Grant.

2009 12. R.B. Dupaix, J.O. Winter, and L.J. Lee, National Science Foundation IGERT Fellowship, "Novel Applications of Hydrogels to Improving Biocompatibility of Electrode Systems," NSF Award No. DGE0221678, $37,000 (*Direct*) of total $3,654,060 award. Grant.

2006-2007 13. K. Jones, J.H. Bolte IV, and R.B. Dupaix, "Biomechanics of Trauma Research – Abdominal Trauma Study," National Highway Traffic and Safety Administration, $ 115,782. Contract.

2004-2007 14. R.B. Dupaix and J.M. Castro, "Hot Embossing of Polymers at the Micro and Nano Scale," National Science Foundation IGERT Fellowship, NSF Award No. DGE0221678, $130,000 (*Direct*) of total $3,654,060 award. Grant.

INVITED TALKS

2005 1. "Large strain behavior of polymers near the glass transition," Department of Mechanical Engineering, Brigham Young University, Provo, UT, Nov.

2005 2. "Large Strain Behavior of Polymers Near the Glass Transition," Department of Mechanical Engineering, University of Colorado, Boulder, CO, Jan.

CONFERENCE PRESENTATIONS

2017 1. "Viscoelastic Modeling of Porcine Brain Tissue", 54th Annual Technical Meeting of the Society of Engineering Science, Boston, MA, Jul.

2015 2. "A Glass-Transition Constitutive Model for Polymethyl Methacrylate (PMMA) and its Ability to Predict Microchannel Hot Embossing Using Multi-Scale Finite Element Simulations", 52nd Annual Technical Meeting of the Society of Engineering Science, College Station, TX, Oct.

2009 3. "Constitutive Modeling of Poly(methyl methacrylate) (PMMA) at Large Strains near the Glass Transition and its Application to Micro-Hot Embossing", 14th International Conference on Deformation, Yield and Fracture of Polymers, Kerkrade, The Netherlands, Apr.

2008 4. "Constitutive Modeling of Rate Dependent Stress-Strain Behavior of Human Liver Tissue in Blunt Impact Loading" 45th Annual Technical Meeting of the Society of Engineering Science, Champaign, IL, Oct.

2006 5. "Large strain mechanical behavior of poly(methyl methacrylate) (PMMA) near the glass transition," 43rd Annual Technical Meeting of the Society of Engineering Science, State College, PA, Aug.

2005 6. "Mechanical Behavior of Electrospun Polycaprolactone (PCL) Fabric," McMat 2005 Conference, Baton Rouge, LA, Jun.

2004 7. "A Constitutive Model for Strain-induced Crystallization in Poly(ethylene terephthalate) (PET) During Complex Loading to Finite Strains," 2004 ASME International Mechanical Engineering Conference and Exposition, Anaheim, CA, Nov.

2004 8. "Modeling the finite strain behavior of poly(ethylene terephthalate) and poly(ethylene terephthalate)-glycol near the glass transition," 41st Annual Technical Meeting of the Society of Engineering Science, Lincoln, NE , Oct.

2003 9. "Large strain constitutive modeling of poly(ethylene terephthalate) and poly(ethylene terephthalate)-glycol above the glass transition," 40th Annual Technical Meeting of the Society of Engineering Science, Ann Arbor, MI, Oct.

2003 10. "Large strain constitutive modeling of poly(ethylene terephthalate) and its application to reheat stretch blow molding," Mechanics and Materials Conference, Joint Meeting of ASME Applied Mechanics and Materials Science Divisions, Phoenix, AZ, Jun.

2002 11. "Constitutive Modeling of PET and PETG," American Chemical Society National Conference, Orlando, FL, Apr.

CAMPUS TALKS

2013 1. "Using Finite Element Analysis as a Tool to Understand Biomechanical Questions," Department of Biomedical Engineering, Ohio State University, Jan.

2007 2. "Mechanical behavior of soft materials," Department of Mechanical Engineering, Ohio State University, Sept.

2004 3. "Large Strain Behavior of Polymeric Materials," Center for Materials Research, Ohio State University, Oct.

TEACHING EXPERIENCE

<u>Undergraduate Required Courses</u>

Honors Statics (Sp2004, Sp2005, Sp2006, Sp2012, Sp2013, Sp2014, Sp2017)

Mechanics of Materials (Au2003, Au2004, Wi2007, Sp2007, Au2013)

Undergraduate Technical Elective Courses

Applied Finite Element Method (Au2006, Au2007, Au2008, Au2009, Au2011, Wi2012, Au2012, Sp2013, Au2013, Sp2014, Au2015, Sp2016, Au2016, Sp2017, Au2018, Sp2018, Sp2019, Au2019)

Introduction to Laminated Composites (Au2015, Au2016)

Graduate Courses

Continuum Mechanics (Wi2004, Wi2005, Wi2006, Wi2008, Wi2009, Wi2012, Au2012, Au2018)

Viscoelasticity (Sp2009, Sp2017)

RESEARCH EXPERIENCE

2003-present Ohio State University, Columbus, Ohio

Directed the Polymer and Soft Tissue Biomechanics Lab. Research areas include mechanical characterization, constitutive modeling, and finite element simulations involving polymers, soft biological tissues, and biomaterials. Advised 6 PhD students (5 completed, 1 current), 15 MS students (13 completed, 2 current), and 7 undergraduate honors thesis students.

1999-2003 Massachusetts Institute of Technology, Cambridge, Massachusetts

Developed a constitutive model to describe the large strain deformation behavior of poly(ethylene terephthalate) and poly(ethylene terephthalate)-glycol in the processing regime. Model included the effects of temperature, strain rate and strain state on the mechanical behavior. Work involved experimental testing of materials, including mechanical experiments, dynamic mechanical analysis, differential scanning calorimetry, and birefringence measurements. Computational work involved continuum modeling of the material and implementation in a finite element package (ABAQUS) to simulate industrial processes. Advisor: Mary C. Boyce

SERVICE

Service to profession

Journal reviews:

Clinical Biomechanics

International Journal of Plasticity
International Journal of Solids and Structures
International Journal of Structural Changes in Solids
Journal of Applied Mechanics
Journal of Biomechanical Engineering
Journal of Composite Materials
Journal of Engineering Materials and Technology
Journal of Intelligent Material Systems and Structures
Journal of Microelectromechanical Systems
Mechanics of Materials
Mechanics of Time-Dependent Materials
Polymer
Proceedings of the Royal Society of London A: Mathematical, Physical and Engineering Science
Smart Materials and Structures

Book reviews:

2015 McGraw-Hill Education Focus Group Participant (e-materials for Statics and Mechanics)
2008 Elsevier: Introduction to Continuum Mechanics (Lai)
2006 Wiley: Statics: Analysis and Design of Systems in Equilibrium (Sheppard/Tongue)
2006 Continuum Mechanics Textbook
2004 Thomson Engineering: Mechanics of Materials (Gere)

Proposal reviews:

Panelist, NSF review panel, 2015.
Panelist, NSF review panel, 2012.
Panelist, NSF review panel, 2011.
Panelist, NSF review panel, 2010.
Panelist, NSF review panel, 2006.
Panelist, NSF review panel, 2005.

Offices held and other service to professional societies

Focus group participant, NSF-sponsored focus group at AAAS "Towards Increasing Diversity in STEM Faculty: Addressing Underrepresentation of Women of all Ethnicities in Nanoscience Fields" 2010.
Co-organizer, technical session at the Society of Engineering Science Annual Meeting, 2010.
Member, Injury Biomechanics Annual Symposium technical committee, 2009-2013.
Session chair, Injury Biomechanics Annual Symposium, 2009-2013.
Member, Central Ohio Injury Biomechanics Engineering Consortium, 2009-2013.
Session chair, Society of Engineering Science Annual Technical Meeting, 2008.
Symposium co-chair, Society of Engineering Science Annual Technical Meeting, 2007.
Session chair, Int Conference on Numerical Methods in Industrial Forming Processes, 2004.

Department/University Service

Departmental committees

Chair, Undergraduate Studies Committee, 2019-Present.
Chair, Continuous Quality Improvement Committee, 2019-Present.
Member, Undergraduate Curriculum Renewal Committee, 2019-Present.
Member, Rob Wolf Award committee, 2015-2016, 2019.
Member, Applied Mechanics faculty search committee, 2017.
Member, Ad hoc committee to define promotion package materials for clinical faculty, 2017.
Member, diversity committee, 2017-present.
Member, Continuous Quality Improvement Committee, 2016-present.
Member, Autonomous Vehicle faculty search committee, 2016.
Chair, Applied Mechanics Interest group, 2012-2014.
Member, Undergraduate Studies Committee, 2010-2013.
Chair, Applied Mechanics Interest Group, 2009-2010.
Member, Undergraduate Studies Committee, Technical Elective ad hoc committee, 2008.
Member, Rob Wolf Award committee, 2006-2008
Member, ABET Self Study Report research group, 2007.
Member, Faculty search committee, 2005.
Member, Graduate Studies Committee, 2004-2007
Contributor, Undergraduate recruitment events, 2003-present.

College or university committees

Member, College Outcomes and Assessment Committee, 2018-Present.
Member, College Committee on Academic Affairs, 2016-2018.
Member, Chief Diversity, Inclusion and Outreach Officer Search Committee, 2014.
Panelist, Office of Research CAREER Award Recipient Panel, 2008.
Member, Student Activity Fee ad hoc committee, 2007.
Vice Chair, Council on Student Affairs, 2006-2007.
Member, Council on Student Affairs, Allocations subcommittee, 2006-2007.
Member, Council on Student Affairs, Senate Committee, 2004-2007.

Initiatives undertaken to enhance diversity

Panelist, Women in Academia Panel, 2008.
Contributor, recruitment activities at the SWE national conference, 2004-2007.
Presenter, Faculty Work-Life Balance Presentation in Women in Engineering Seminar, 2007
Contributor, Engineering Preview Day Faculty Discussion (Women in Engineering), 2007.
Contributor, Columbus School for Girls 3rd Grade Outreach Event on Robotics, 2007.
Recruiter, College of Engineering Booth at SWE Career Fair, 2007.
Recruiter, College of Engineering Booth at SWE Career Fair, 2006.

Panelist, Women and Academic Careers panel at SWE National Conference, 2006.
Organizer, department events for recruitment and retention of women students, 2006-present.
Presenter, Society of Women Engineers Junk Yard Battles Faculty Presentation, 2006.
Recruiter, College of Engineering Booth at SWE Career Fair, 2005.
Participant, Workshop for the Retention and Advancement of Underrepresented Engineering Educators, 2003.

Extracurricular university service

Advisor to student groups and Organizations

Advisor, Common Cents Investing Group, 2007 – 2010.
Advisor, Mechanical Graduate Student Association , 2009 – 2010.

Professional memberships

American Society of Engineering Education (ASEE)
American Society of Mechanical Engineering (ASME)
Society of Engineering Science (SES)
Society of Women Engineers (SWE)