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PEGGY A. SHIBATA, M.S., P.E.
SENIOR CONSULTANT

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Ms. Shibata is a Senior Consultant for Engineering Systems Inc. (ESI). Ms. Shibata specializes in mechanical engineering and biomechanics, with particular expertise in accident reconstruction, whole-body kinematics, balance, gait, human injury tolerance, and injury analyses associated with transportation, recreational activities and equipment, and falls. Relevant experience includes the evaluation of biomechanical and safety issues related to consumer products, assessment of product design relative to applicable safety standards, and adult and pediatric surrogate testing.

Areas of Specialization

Human Injury Tolerance
Injury Analysis
Accident Reconstruction
Amusement Rides and Devices
Human Factors
Human Surrogate Testing
Analysis of Human Motion
Slips, Trips, and Falls
Consumer Products

Education

M.S.E., Biomedical Engineering, University of Michigan, Ann Arbor, MI, 2004
M.S.E., Mechanical Engineering, University of Michigan, Ann Arbor, MI, 2003
B.S., Mechanical Engineering, Minor: Bioengineering, University of Pittsburgh, Pittsburgh, PA, 2001

Licensed Professional Engineer (P.E.)

State of Michigan
National Council of Examiners for Engineering and Surveying (NCEES)

License No. 6201055794
Reg. No. 41895

Professional Affiliations/Honors

American Society for Testing and Materials (ASTM), Active, Voting Member
Committee F24 on Amusement Rides and Devices
Subcommittee F24.10 Test Methods and Component Parts
Subcommittee F24.24 Design, Manufacture, Installation and Commissioning
Subcommittee F24.70 Water Related Amusement Rides and Devices

International Society for Occupational Ergonomics & Safety (ISOES), Member

Society of Automotive Engineers (SAE), Member

American Society of Mechanical Engineers (ASME), Member



Pi Tau Sigma (Mechanical Engineering Honor Society)

Tau Beta Pi (Engineering Honor Society) Pennsylvania Lambda Chapter

Positions Held

Engineering Systems Inc., Ann Arbor, MI

Senior Consultant, 2016–Present
Senior Staff Consultant, 2010-2015

Packer Engineering, Inc. Ann Arbor, MI

Senior Staff Engineer, Biomechanics, 2004-2010

Continued Education

Certified Ergonomics Assessment Specialist
The Back School, Atlanta, GA, 2023

Using Warnings and Instructions to Increase Safety and Reduce Liability
University of Wisconsin-Madison, 2023

Traffic Signal Timing Records Interpretation and Analysis
Traffic Signal Academy, University of Tennessee, 2020

Safety Belt Examinations
Institute of Police Technology Management, University of North Florida, Jacksonville, FL 2020

Human Factors in Traffic Crash Reconstruction
Institute of Police Technology Management, University of North Florida, Fort Myers, FL 2017

Driver Distraction from Electronic Devices: Insights and Implications
SAE International, 2017

Understanding Bloodstain Pattern Analysis
Bevel, Gardner & Associates, Ann Arbor, MI, 2017

Traffic Crash Reconstruction I
Northwestern University Center for Public Safety, 2015

The University of Michigan Center for Occupational Health & Safety Engineering
Using the 3D Static Strength Prediction Program, 2013

SAE Tire and Wheel Safety Issues, 2011

ASME International 20-Hour Course
Project Management for Engineers, 2007

Engineering Dynamics Corporation 20-Hour HVE Forum Workshop, 2006

Industrial Fork Truck Operator Safety Training, 2006

Engineering Dynamics Corporation HVE Introductory Training, 2005

Traffic Accident Reconstruction II
Northwestern University Center for Public Safety, 2005

SAE Vehicle Accident Reconstruction Methods, 2004

OSHA 10-Hour General Industry Safety Standards, 2004

Technical Reports / Publications / Presentations

Fortenbaugh, D., **Shibata, P.**, Meza-Arroyo, M., & Thobe, K., Welch, T. (2022). Flip-Flops: A Survey of Risk Perception and Acceptance. Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 66(1), 513–517.

Final Report: Compliance Testing for Locomotive LED Headlights and Auxiliary Lights, Phase IV,” M. Meza-Arroyo, **P.A. Shibata**, J.K. Sprague, S. Woods. (2021) U.S. Department of Transportation. Federal Railroad Administration. Office of Railroad Policy and Development Office of Research and Development, Washington, DC 20590.

Final Report: Phase III of Compliance Testing for Locomotive LED Headlights and Auxiliary Lights, Meza-Arroyo, M., **Shibata, P.**, Sprague, J. (2021). U.S. Department of Transportation. Federal Railroad Administration. Office of Railroad Policy and Development Office of Research and Development Washington, DC 20590.

Final Report: Phase II of Compliance Testing for Locomotive LED Headlights and Auxiliary Lights, Meza-Arroyo, M., **Shibata, P.**, Sprague, J., Capser, S. (2019). U.S. Department of Transportation. Federal Railroad Administration. Office of Railroad Policy and Development Office of Research and Development Washington, DC 20590.

Final Report: Phase I of Compliance Testing for Locomotive LED Headlights and Auxiliary Lights, Meza-Arroyo, M., **Shibata, P.**, Woods, S. (2018). U.S. Department of Transportation. Federal Railroad Administration. Office of Railroad Policy and Development Office of Research and Development Washington, DC 20590.

“Comparative Lumbar Spine Acceleration Data During Daily and Dynamic Activities, Tasks of Daily Driving, and Low Speed Lateral Vehicle Impacts.” **P.A. Shibata**, A.C. Mathias, A.E. Light, M. Meza-Arroyo, J.K. Sprague, A.L. Stern. Biomedical Sciences Instrumentation, 56th Annual Rocky Mountain Bioengineering Symposium, Milwaukee, WI. April 2019. Biomedical Sciences Instrumentation Journal, Volume 55(2). pp. 159-166.

“Head Acceleration Measurements During Vehicle Driving Tasks and Lateral Impacts Relative to Head Accelerations During Daily and Dynamic Activities.” **P.A. Shibata**, A.C. Mathias, A. Light, M. Meza-Arroyo, J.K. Sprague, A.L. Stern. Biomedical Sciences Instrumentation, 56th Annual Rocky Mountain Bioengineering Symposium, Milwaukee, WI. April 2019. Biomedical Sciences Instrumentation Journal, Volume 55(2). pp. 120-127.

- Enhancing Contrast-Sensitivity Charts for Validating Visual Representations of Low-Illumination Scenes.” J.K. Sprague, M. Meza-Arroyo, **P.A. Shibata**, J.A. Auflick “SAE Technical Paper 2019-01-1009, 2019.
- “The Kinematic Analysis of Occupant Excursions and Accelerations During Staged Low Speed Far-Side Lateral Vehicle-to-Vehicle Impacts,” **P.A. Shibata**, J.M. Roberts, J.K. Sprague, A.E. Light, J.A. Stegemann, M. Meza-Arroyo, S.P. Capser, SAE Technical paper 2019-01-1030, 2019.
- Analysis of an Unexpected Impact to the Crown of the Head”, **P.A. Shibata**, A.L. Stern, J.M. Roberts, J.A Stegemann, “Proceedings of The XXVIIIth Annual International Occupational Ergonomics and Safety Conference, Chicago, IL, pp. 126-131, June 9-10, 2016.
- “Human Factors Techniques in the Analysis of Low Illumination Accidents: Integrating Conspicuity, Validated Photography, and Scientific Animation”, J.L. Auflick, J.K. Sprague, **P.A. Shibata**, and, D. Kruger, Proceedings of the Human Factors and Ergonomics Society 59th Annual Meeting, Los Angeles, CA, October 26-29, 2015.
- A Link Between Occupant and Vehicle Accelerations During Common Driving Tasks. Biomed Sci Instrum, A.C. Mathias, **P.A. Shibata**, and J.K. Sprague presented at the 51st Annual Rocky Mountain Bioengineering Symposium, Denver, Colorado, 50:197-204 (2014).
- “Analysis of Nighttime Vehicular Collisions and the Application of Human Factors: An Integrated Approach” J.K. Sprague, **P.A. Shibata**, and J.L. Auflick, SAE Technical Paper 2014-01-0442 SAE International: 2014.
- “Age and gender moderate the effects of localized muscle fatigue on lower extremity joint torques used during quiet stance”, L.A. Wojcik, M.A. Nussbaum, D. Lin, **P.A. Shibata**, and M.L. Madigan, Human Movement Science, 30, (2011) 574-583.
- “Age and Gender Differences in the Effects of Localized Muscle Fatigue on Joint Torques Used During Bipedal Stance”, L.A. Wojcik, D. Lin, M.A. Nussbaum, **P.A. Shibata**, and M.L. Madigan, Proceedings of the ASME 2009 Summer Bioengineering Conference, American Society of Mechanical Engineers, SBC2009-204239.
- “Determining Angular Head Accelerations Using an External Array of Linear Accelerometers: A Preliminary Analysis of Everyday Activities,” L.A. Wojcik, **P.A. Shibata**, and J.K. Sprague, Proceedings of the 2005 Summer Bioengineering Conference, J.S. Wayne, F. Guilak, G.A. Livesay, and J.W. Holmes, eds., The American Society of Mechanical Engineers, #b0055211, Vail, Colorado, 2005.
- “Kinematic analyses of the 180o standing turn: Effects of age on strategies adopted by healthy young and older women”, **P.A. Meinhart-Shibata**, M. Kramer, J.A. Ashton-Miller, C. Persad, Gait and Posture 2005; 22:119-125.
- “Evidence of Age, Effects on Standing Turn Strategies in Healthy Females”, **P.A. Meinhart-Shibata**, J.A. Ashton-Miller, C. Persad, N. Alexander, Program from the 56th Annual Scientific meeting of The Gerontological Society of America, The Gerontologist, Vol. 43, (Special Issue I), p. 379, San Diego, CA 2003.



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August 2024

"A Kinematic Analysis of Effects of Age on Standing Turn Execution in Healthy Females", **P.A. Meinhart**, J.A. Ashton-Miller, C. Persad, Proceedings of the 27th Annual Meeting of the American Society of Biomechanics (Toledo, OH 2003).

"Human Factors in Claims/Litigation," Technical Presentation for Toledo Claims Association, Toledo, Ohio, **Co-Lecturer** with Jack L. Auflick, Ph.D., January 10, 2013.

"Biomechanics: Understanding Its Use in Claims and Litigation," Continuing Education Technical Presentation for attorneys and insurance professionals, ESI-Ann Arbor, Michigan Open House Event, **Co-Lecturer** with Erick H. Knox, Ph.D., P.E., May 17, 2012.