Peggy A. Shibata P.E.

Senior Consultant

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.

Licenses & Certifications

- State of Michigan P.E. License No. 6201055794
- National Council of Examiners for Engineering and Surveying (NCEES) Reg. No. 41895

Positions Held

Engineering Systems Inc., Ann Arbor, Michigan

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

Packer Engineering, Inc., Ann Arbor, Michigan

- Senior Staff Engineer, Biomechanics, 2004 - 2010

Publications

Aboveground Swimming Pool Child Access Prevention Through Product Design

D.B. Brickman, J.P. Mohorovic, K.B. Zakutansky, A.C. Mathias, and **P.A. Shibata**. Proceedings of the XXXVIth Annual International Occupational Ergonomics and Safety Conference, Denver, CO / Hybrid, August 5-6, 2024.

Flip-Flops: A Survey of Risk Perception and Acceptance

D.M. Fortenbaugh, **P.A. Shibata**, M. Meza-Arroyo, K.R. Thobe, T.D. Welch. (2022). 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 I

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.

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Education

M.S.E., Biomedical Engineering.
University of Michigan. 2004

M.S.E., Mechanical Engineering.
University of Michigan. 2003

B.S., Mechanical Engineering.
University of Pittsburgh. 2001

Areas of Specialization

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

Final Report: Compliance Testing for Locomotive LED Headlights and Auxiliary Lights, Phase III

M. Meza-Arroyo, **P.A. Shibata**, J.K. Sprague. (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: Compliance Testing for Locomotive LED Headlights and Auxiliary Lights, Phase II

M. Meza-Arroyo, **P.A. Shibata**, J.K. Sprague, S.P. Capser. (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: Compliance Testing for Locomotive LED Headlights and Auxiliary Lights, Phase I

M. Meza-Arroyo, **P.A. Shibata**, S. Woods. (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**, D.H. 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 180° 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.

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).

Presentations

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.

Continuing 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

Professional Affiliations/Honors

American Society for Testing and Materials (ASTM)

- 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)

- Member

Tau Beta Pi (Engineering Honor Society)

- Member, Pennsylvania Lambda Chapter