ELAINE R. SERINA

Specialized Professional Competence

Biomechanics including analysis of human injury mechanism and causation. Kinematics and kinetics of human movement. Accident reconstruction including motor vehicle, recreational equipment and rides, and industrial equipment. Computer simulation and analysis of vehicle dynamics, including whole-body vibration, and occupant kinematics. Rigid body dynamic analysis of three-dimensional systems. Ergonomic analysis pertaining to occupational biomechanics.

Background and Professional Honors

B.S. (Mechanical Engineering), University of California, Berkeley
M.S. (Mechanical Engineering), University of California, Berkeley
Ph.D. (Mechanical Engineering), University of California, Berkeley

Principal,
Talas Engineering, Inc.
Managing Engineer,
Piziali and Associates, Inc.
Instructor,
Department of Math and Sciences, Laney College
Graduate Student Researcher,
Ergonomics Program, University of California, Berkeley and San Francisco
Department of Mechanical Engineering, University of California, Berkeley
Graduate Student Instructor,
Department of Mechanical Engineering, University of California, Berkeley
Research Engineer,
Kinamed, Inc.

Registered Professional Mechanical Engineer, California, #M30836

Certified Crash Data Retrieval System Technician
Certified Forklift Operator

Professional Activities & Memberships

Past Reviewer, American Society of Biomechanics Clinical Biomechanics Award
Former Review Committee, American Society of Biomechanics (2013, 2015)
Past Reviewer, Human Factors and Ergonomics Society Annual Meeting

Past Reviewer, Grants for Traumatic Injury Biomechanics, Center for Disease Control, National Center for Injury Prevention and Control (CDC NCIPC), Review Committee
Past Reviewer, Special Emphasis Panel: Occupational Health and Safety Research, NIOSH
Past Transaction Selection Committee Member, Society of Automotive Engineers
Past Reviewer, Journal of Biomechanical Engineering

Member, American Society of Biomechanics
Member, American Society of Mechanical Engineers
Member, Association for the Advancement of Automotive Medicine
Member, Human Factors and Ergonomics Society
Member, SAE International (Society of Automotive Engineers)

Awards

Finalist, Doctoral Student Paper Competition at the ASME International Mechanical Engineering Congress and Exposition, 1995
National Science Foundation Minority Graduate Fellowship
University of California Affirmative Action Dissertation-Year Fellowship
Soroptimist International Founder Region Fellowship
ASME Auxiliary Parsons Scholarship
Graduated with Honors
University of California Berkeley Honorary Scholarship
Tau Beta Pi (engineering honor society)
Pi Tau Sigma (mechanical engineering honor society)

Selected Publications and Presentations

"Slopes, Spirals, and Splashes: Rider Biomechanics on Three Common Recreational Water Slides and Rides," 10th World Congress of Biomechanics, Vancouver, Cananda, July 2026 (with E. Bliven and N. Schneider).

"A Biomechanical Investigation of Strike Kinematics in the Filipino Martial Art of Arnis: Use of Segmental Timing and Proximal-to-Distal Energy and Momentum Transfer to Generate Powerful Stick Strikes," 10th World Congress of Biomechanics, Vancouver, Cananda, July 2026 (with E. Mockensturm, N. Schneider, and E. Chiang).

"Whole-Body Vibration on Recreational Vehicles: Comparison with Occupational Exposure," 7th World Congress of Biomechanics, Boston, MA, July 2014 (with K. White).

"Lumbar Loads while Operating Vehicles in an Industrial Environment," 7th World Congress of Biomechanics, Boston, MA, July 2014 (with C.Y. Chang, D.M. Desautels, and K. White).

"Industrial Helmet Effectiveness in Mitigating Head Accelerations in Impacts with Rigid Surfaces," 7th World Congress of Biomechanics, Boston, MA, July 2014 (with C.Y. Chang).

"Common Head Acceleration Exposures in the Early Pediatric Population," Annual Meeting of the American Society of Biomechanics, University of Florida, August 2012 (with D. Desautels).

"The Effect of Speed on the Dominant Axis of Whole-Body Vibration on Locomotives," 4th American Conference on Human Vibration, Hartford, CT, June 2012 (with K. White).

"Impact Forces When Stepping Off Moving Railroad Equipment," Annual Meeting of the American Society of Biomechanics, Long Beach, CA, August 2011 (with K. White).

"Occupant Kinematics in Locomotive Low-Speed Impacts," Annual Meeting of the American Society of Biomechanics, Penn State University, August 2009 (with F.J. Peterson, K. White, and D. Desautels).

"Introduction to Biomechanics," Invited Lecture, Department of Engineering, Mission College, April 2006.

"Biomechanical Analyses of Railroad Injuries," Invited Presentation, Forensic, Evidentiary & Technical Aspects of Railroad Litigation, Atlanta, GA, May, 2003.

"Biomechanics of Human Injury," Course, University of California at Berkeley Extension Program, CA, February - March, 2003.

"A Methodology for Determining Injury Causation in Accidents," Invited Presentation, Mechanical Engineering Graduate Dynamics Lecture, Stanford University, Stanford CA, February, 2003.

"Biomechanical Analysis of Acute Lumbar Intervertebral Disc Loading," 4th World Congress of Biomechanics, Calgary, Canada, August 2002 (with D. Girvan).

"Biomechanics: Understanding the Human Machine," Course, Stanford University, Stanford CA, January - March, 2002.

"Biomechanics for Scientists and Engineers," Course, University of California at Berkeley Extension Program (San Francisco Center), CA, November, 2001.

"Occupant Kinematics and Injury Biomechanics in Rollover Accidents," Invited Presentation, American Society of Mechanical Engineers, San Francisco Section Meeting, October, 2001.

"Mechanism of Injury," San Mateo County Field Care Audit, Presented by Stanford University Hospital Emergency Department and Trauma Center, February, 2001.

"Biomechanics: Understanding the Human Machine," Course, Stanford University, Stanford CA, June - July, 2000.

"Wrist and Forearm Posture and Motion During Typing," *Ergonomics*, 1999 (with R. Tal and D. Rempel).

"A Structural Model of the Forced Compression of the Fingertip Pulp," *Journal of Biomechanics*, 1998 (with E.M. Mockensturm, C.D. Mote, Jr., and D. Rempel).

"Force Response of the Fingertip Pulp to Repeated Compression: Effects of Loading Rate, Loading Angle, and Anthropometry," *Journal of Biomechanics*, 1997 (with C.D. Mote, Jr., and D. Rempel).

"The Effect of Keyboard Keyswitch Make Force on Applied Force and Finger Flexor Muscle Activity," *Ergonomics*, 1997 (with D. Rempel, E. Klinenberg, B.J. Martin, T.J. Armstrong, J.A. Foulke, and S. Natarajan).

"Characterization and Modeling of the Fingertip Pulp Under Repeated Loading," *Ph.D. dissertation*, Department of Mechanical Engineering, University of California, Berkeley, 1996.

"Fingertip Pulp Response During Keystrikes," 19th Annual Meeting of the American Society of Biomechanics, Atlanta, GA, October, 1996.

"Force Transmission of the Fingertip Pulp during Keyboard-like Work," Marconi Input Device Research Conference, Point Reyes, CA, January, 1996.

"Keyboard Reaction Force and Finger Flexor Electromyograms during Computer Keyboard Work," *Human Factors*, 1996 (with B.J. Martin, T.J. Armstrong, J.A. Foulke, S. Natarajan, E. Klinenberg, and D. Rempel).

"Force-EMG Relationship: Muscle Load Assessment in Typing Tasks," Marconi Input Device Research Conference, Point Reyes, CA, January, 1996.

"Mechanical Properties of the Fingertip Pulp Under Repeated, Dynamic, Compressive Loading," ASME International Mechanical Engineering Congress and Exposition, Bioengineering Division, San Francisco, CA, November, 1995.

"Wrist Postures White Typing on a Standard and Split Keyboard," Proceedings of the Human Factors and Ergonomics Society 39th Annual Meeting, 1995.

"Correlations between Anthropometry and Wrist Postures while Typing on a Standardized Workstation," PREMUS, 1995.

"Stiffness of In Vitro Fingertip Soft Tissue in Compression," 2nd World Congress of Biomechanics, Amsterdam, Netherlands, July, 1994.

"Intraoperative Femoral Fractures Treated with Cerclage Fixation: A Finite Element Stress Analysis", 40th Annual Orthopaedic Research Society Meeting, New Orleans, LA, February, 1994.

"Wrist and Arm Angles During Typing," Marconi Keyboard Research Conference, Point Reyes, CA, February, 1994.

"A System for Evaluating the Effect of Keyboard Design on Forced Posture, Comfort, and Productivity," *Ergonomics*, 1994 (with P. Smutz, T. Bloom, and D. Rempel).

"Finger Force during Computer Keyboard Work. Part II: Relation of Keyswitch Make Force to Applied Force and Surface EMG," International Ergonomics Association Congress, Toronto, Canada, 1994.

"Fingertip Kinematics and Forces during Typing," 17th Annual Meeting of the American Society of Biomechanics, Atlanta, GA, 1993.

"Intraoperative Femoral Fractures Treated with Cerclage Fixation: A Finite Element Stress Analysis," *Master's thesis*, Department of Mechanical Engineering, University of California, Berkeley, 1992.

"Thoracic Injury Potential of Basic Competition Taekwondo Kicks," *Journal of Biomechanics*, 1991 (with D.K. Lieu).