

## **ELAINE R. SERINA**



### **Specialized Professional Competence**

Biomechanics including analysis of human injury mechanism, causation, and tolerance. Analysis of human movement. Accident reconstruction. Computer simulation and analysis of vehicle dynamics and occupant kinematics. Analysis of mechanical systems. Rigid body dynamic analysis of three-dimensional systems. Ergonomic analysis. Static and dynamic experimental test design and analysis.

### **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 Forklift Operator

### **Professional Activities & Memberships**

American Society of Biomechanics 2013 Review Committee

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 Doctoral 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**

“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,” 4<sup>th</sup> 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 Keystrokes,” 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 While Typing on a Standard and Split Keyboard,” Proceedings of the Human Factors and Ergonomics Society 39<sup>th</sup> 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).