

Kari A. Danek, Ph.D.
Senior Associate

Professional Profile

Dr. Kari Danek is a Senior Associate in Exponent's Mechanics and Materials practice. Dr. Danek's areas of expertise include the biomechanics of traumatic and chronic human injury, evaluation of occupant kinematics and kinetics in automobile collisions, automobile accident reconstruction, and occupational biomechanics. Dr. Danek specializes in determining the forces and motions experienced by an individual under certain conditions, such as during an accident or while performing a particular job-related task. Dr. Danek uses this analysis to determine how the subject conditions would compare to injury tolerance levels as well as the forces and motions typically experienced during normal activities of daily living. She has applied these techniques to automobile accidents, pedestrian/train collisions, industrial accidents, and slip and fall accidents. In addition, Dr. Danek has applied her knowledge and experience in mechanics and electromechanical design to assist clients with intellectual property litigation work.

Prior to joining Exponent, Dr. Danek worked in the Haptix Laboratory at the University of Michigan and collaborated extensively with the Human Neuromechanics Laboratory, also at the University of Michigan. Her academic research, training, and teaching combined theoretical controls, mechatronics, and motor control to design, build, and test new robotic paradigms for lower limb neurological rehabilitation in stroke and spinal cord injury subjects. Dr. Danek has also spent time as a researcher at the Rehabilitation Institute of Chicago working directly with stroke subjects. Dr. Danek has experience in electromechanical design, design, and implementation of automatic control systems, real-time control and data acquisition, rehabilitation applications for robotics, human motion capture, computational modeling, and human motor control.

Academic Credentials and Professional Honors

Ph.D., Mechanical Engineering, University of Michigan, Ann Arbor, 2008
M.S., Mechanical Engineering, University of Michigan, Ann Arbor, 2005
B.S., Mechanical Engineering, University of Virginia, 2002

Pi Tau Sigma; Tau Beta Pi

Department Summer Fellowship, University of Michigan, 2007; Rackham Recruitment Fellowship, University of Michigan, 2002–2003; Undergraduate Research and Design Symposium Finalist, University of Virginia, 2002; Margaret Elinor George Scholarship, University of Virginia, 2001; Rodman Scholar, University of Virginia, 1998–2002; National Merit Scholarship, 1998

Publications

Danek KA, Gillespie RB, Ferris DP, Grizzle JW, Patton JL. Limited assistance practice increases active dorsiflexion range of motion in the impaired ankle of stroke subjects. North Am Conf on Biomech (NACOB), Ann Arbor, MI, 2008.

Danek KA, Ferris DP, Grizzle JW, Gillespie RB. Upper and lower limb disturbance rejection of self-triggered and computer-cued load perturbations. Am Soc of Biomech (ASB), Palo Alto, CA, 2007.

Danek KA, Gillespie RB, JW Aldridge, Ferris DP, Grizzle JW. A dual input device for self-assisted control of a virtual pendulum. In: International Conf on Rehab Robotics (ICORR), Chicago, IL, 2005.

Professional Affiliations

- American Society of Biomechanics
- IEEE Control Systems Society