

Kari A. Danek, Ph.D., P.E.
Senior Engineer

Professional Profile

Dr. Kari Danek is a Senior Engineer in Exponent's Mechanical Engineering practice. Dr. Danek's areas of expertise include automatic control systems, electromechanics, and machine design. She also has expertise in the biomechanics which she uses to determine the kinetics and kinematics of human movement and the mechanisms of chronic and traumatic human injury. Dr. Danek applies her experience with mechanics, modeling, and sensors and actuators to evaluate machine system safety and performance. The combination of her electromechanical and biomechanical backgrounds allows her to examine machine guarding and safety with a holistic perspective that incorporates the machine and environment with human interaction and performance. Dr. Danek provides assistance with intellectual property litigation work.

Prior to joining Exponent, Dr. Danek worked in the Haptix (Haptics) Laboratory at the University of Michigan designing tactile virtual environments and studying human interactions and information transfer through touch and force-feedback. At the University of Michigan, she also collaborated extensively with the Human Neuromechanics Laboratory. 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

Licenses and Certifications

Registered Professional Engineer, Illinois, #062062978
40-Hour HAZWOPER certified
Respirator and SCBA fit-tested and trained
PADI certified open water SCUBA diver

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
- American Society of Mechanical Engineers