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R. Paul Crawford, Ph.D., P.E.

Professional Profile

Paul Crawford specializes in accident analysis, safety systems, and biomechanics of human motion and injury. He has extensive experience in dynamic analysis of vehicles, occupants, sporting activities, workplace accidents, and falls as well as the design, development and testing of professional and consumer products. Dr. Crawford's research has included analytical, experiments, and computational analyses of the structural and material properties of bone and neurological tissues. His research has also involved the technology, engineering and science of brain-computer interfaces with special applications in the assessment of user experience and cognitive workload. Dr. Crawford also performs computer-based accident reconstruction and simulation, including time-motion analyses and three-dimensional data acquisition using video and photogrammetry.

Before joining InSciTech, Dr. Crawford worked at Hegemony Technologies LLC (Davis, CA); Intel Corporation (Folsom, CA); O.N. Diagnostics LLC (Berkeley, CA); University of California, San Francisco (San Francisco, CA); Exponent Failure Analysis Associates, Inc. (Menlo Park, CA), and Booz Allen & Hamilton Inc. (Bethesda, MD).

Credentials, Licenses and Appointments

Ph.D. (Mechanical Engineering), University of California, Berkeley, 1995

M.S. (Mechanical Engineering), University of California, Berkeley, 1993

B.S. (Mechanical Engineering), Texas A&M University, *magna cum laude*, 1988

Registered Professional Mechanical Engineer, California, #M30988

UCLA Engineering Dean's Advisory Council (2011-2015); Cardiowise Scientific Advisory Board (2011-2015); Visiting Scholar, University of California, Berkeley (2001-2003); National Science Foundation (NSF) Graduate Fellow; ASME Aux. Marjorie Roy Thermal Scholar

Publications

"Adaptive smartphone-based sensor fusion for estimating competitive rowing kinematic metrics", PLoS ONE 14(12): e0225690, 2019 (with B. Cloud, B Tarien, et al.)

"Differential Prefrontal Response during Natural and Synthetic Speech Perception: An fNIR Based Neuroergonomics Study" Foundations of Augmented Cognition, Vol. 8027, pp. 241-249, 2013 (with H. Ayaz, A. Curtin, et al.)

"Relationship between Axial and Bending Behaviors of the Human Thoracolumbar Vertebra", Spine, Vol. 29, No. 20, pp.2248-55, 2004 (with T. Keaveny)

"Finite Element Models Predict In Vitro Vertebral Body Compressive Strength Better than Quantitative Computed Tomography", Bone, Vol. 33, No. 4, pp. 744-50, 2003 (with C. Cann and T. Keaveny)

"Quantitative Computed Tomography-Based Finite Element Models of the Human Thoracolumbar Vertebral Body: Effect of Element Size on Stiffness, Damage, and Fracture Strength Predictions", Journal of Biomechanical Engineering, Vol. 125, No. 4, pp. 434-438, 2003 (with W. Rosenburg and T. Keaveny)

"The Yielding, Elastic Flow, and Fracture Behavior of Ultra-High Molecular Weight Polyethylene Use in Total Joint Replacements", Journal of Biomaterials, Vol. 19, No. 21, pp. 1989-2003, 1998 (with S. Kurtz, L. Pruitt, et al.)

"Systematic and Random Errors in Compression Testing of Trabecular Bone", Journal of Orthopaedic Research, 15:101-110, 1997 (with T. Keaveny, T. Panilla, et al.)

"Ski Binding Minimum Retention Requirements: Applications in Binding Design and Adjustment," PhD dissertation, University of California, Berkeley, 1995

Patents

"System for sensor-based objective determination", U.S. patent 10,532,265 (issued January 14, 2020)

"Adjustment of magnetic force in a computing device" U.S. patent 10,503,216 (issued December 10, 2019)

"Devices, systems, and methods for enriching communications" U.S. patent 10,373,508 (issued August 6, 2019)

"Sensor associated data of multiple devices-based computing", U.S. patent 9,495,397 (issued Nov 15, 2016)