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Engineering & Scientific Consulting

Robert Bove, Jr., Ph.D., P.E.

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Professional Profile

Dr. Bove's area of expertise is injury biomechanics, with an emphasis on human kinematics and human tolerance to forces. He performs accident reconstruction and biomechanical analyses to determine the kinematics associated with an event and to evaluate potential injury mechanisms.

Dr. Bove's work includes analysis of falls from a height, injuries occurring in occupational and industrial accidents, motor vehicle accidents, and injuries involving the use of consumer products. Dr. Bove also has experience evaluating elevator incidents and accidents involving injuries sustained in swimming pools.

Dr. Bove's research experience includes analysis of ladder fall accidents, occupant kinematics during motor vehicle accidents, head accelerations in low-speed impacts and in activities of daily living, cervical spine loading in low-speed impacts and in activities of daily living, and examination of how occupants of different body sizes (including obese occupants) fit within the occupant compartment of a motor vehicle.

Dr. Bove received his doctorate in Bioengineering from the University of Pennsylvania in 2003, where he worked with the Electrophysiology Research Group at the University of Pennsylvania Presbyterian Medical Center conducting studies using a laser imaging system to analyze the movement of electrical wave fronts in the heart during ventricular fibrillation. Prior to joining Exponent, Dr. Bove was an engineer at Galaxy Scientific Corporation, where he worked evaluating image compression software for military and medical applications. Dr. Bove's prior work experience also includes employment by the Central Intelligence Agency. Dr. Bove has also held an academic appointment as a Visiting Lecturer in the Department of Mechanical and Aerospace Engineering at Princeton University and as an Adjunct Professor in the Department of Mechanical Engineering at Temple University.

Academic Credentials & Professional Honors

Ph.D., Bioengineering, University of Pennsylvania, 2003

M.S.E., Bioengineering, University of Pennsylvania, 1996

B.S., Biomedical Engineering, Catholic University of America, 1994

Ashton Fellowship, University of Pennsylvania, 1994-1998

University Fellowship, University of Pennsylvania, 1994

Biomedical Engineering Society Award, Catholic University of America, 1994

Tau Beta Pi (Engineering Honor Society)

Arch Diocesan Scholarship, Catholic University of America, 1989-1993

Licenses and Certifications

Professional Engineer, Pennsylvania, #PE088871

Professional Affiliations

Society of Automotive Engineers (member)

Publications

Rapp van Roden E, George J, Milan L, Bove R. Evaluation of injury patterns and accident modality in step ladder-related injuries. Applied Ergonomics 96, 2021.

George J, Davis M, Sharpe S, Olberding J, Imler S, Bove R. Evaluation of occupant kinematics during low-to moderate-speed side impacts. Society of Automotive Engineers, SAE 2020-01-1222.

Wodin-Schwartz S, Verghese P, Bove R, Kennedy E. Falling body impact behavior of fiberglass stepladders with plastic knee braces. Proceedings, ASME 2015 International Mechanical Engineering Congress and Exposition, IMECE2015, Houston, TX, November 13-19, 2015.

Bussone W, Prange M, Bove R, Daniel T. Neck loads in playground activities in a pediatric population. Society of Automotive Engineers, SAE 2012-01-0560.

Bussone W, Bove R, Thomas R, Richards D, Prange M. Six-degree-of-freedom accelerations: Linear arrays compared with angular rate Sensors. Society of Automotive Engineers, SAE 2010-01-1017.

Bussone W, Moore T, Richards D, Bove R, Scher I, Prange MT. Measurements of non-injurious head accelerations of a pediatric population. Society of Automotive Engineers, SAE 2009-01-0383.

Gloeckner DC, Bove RT, Croteau J, Corrigan CF, Moore, TLA. Timing of head-to-vehicle perimeter contacts in rollovers. Paper 2007-01-0370 presented at the 2007 SAE World Congress, April 2007.

Yamaguchi GT, Ashby BM, Luepke PA, Moore TLA, Bove RT, Corrigan CF. Theoretical analysis of a method of computing dynamic roof crush during rollovers. Paper 2007-01-0366 presented at the 2007 SAE World Congress, April 2007.

Bove RT, Fisher JL, Ciccarelli L, Cargill RS, Moore TLA. The effects of anthropometry on driver position and clearance measures. Paper 2006-01-0454 presented at the 2006 SAE World Congress, April 3-6, 2006.

Vijayakumar V, Scher I, Gloeckner DC, Pierce J, Bove R, Young, Cargill R. Head kinematics and upper neck loading during simulated low-speed rear-end collisions: A comparison with vigorous activities of daily living. Paper 2006-01-0247 presented at the 2006 SAE World Congress, April 3-6, 2006.

Bove RT, Dillon SM. Optically imaging cardiac activation with a laser system. IEEE Engineering in Medicine and Biology 1998; 17:84-94.

Pruente HM, Bove RT, Kwaku K, Dillon SM. Animated images of cardiac membrane voltage during defibrillation. J Electrocard 1995; 28:7-14.

Presentations and Published Abstracts

Fisher J, Bove R, Moore T. Lumbar spine loads in low- and moderate-speed rear-end collisions. Proceedings, ASME 2008 Summer Bioengineering Conference, Marco Island, FL, 2008.

Moore T, Bove R. Using injury tolerance data to reconstruct accidents. Proceedings, ASME 2008 Summer Bioengineering Conference, Marco Island, FL, 2008.

Steffey DL, Bove RT, Fisher JL, Cicarelli L, Cargill RS, Moore TLA. Characterization of occupant anthropometry and clearance measures in passenger cars. Joint Statistical Meetings, Seattle, WA, August 6-10, 2006.

Bove RT, Dillon SM. A new high performance system for imaging cardiac electrical activity. Circulation 1996; 94: I-714 (abstract).

Pruente HM, Bove RT, Kwaku K, Dillon SM. Animated images of cardiac membrane voltage during defibrillation. In: Okin PM and Kornreich F (Chairs), Abstracts, International Society for Computerized Electrocardiology, 20th Annual Conference, 1995.