Research Methodologies and Statistical Approaches to Understanding Driver Fatigue Factors in Motor Carrier Safety and Driver Health

Committee

Matthew Rizzo

Co-Chair

MATTHEW RIZZO is director of SIREN (Simulator for Research in Ergonomics and Neuroscience) Laboratory, ARGOS (Automobile for Research in Ergonomics and Safety), NIRVANA (Nissan-Iowa Instrumented Vehicle for Ergonomics and Neuroscience), Department of Neurology, University of Iowa. He is also director, Visual Functional Laboratory, Department of Neurology, senior faculty member, Division of Behavioral Neurology and Cognitive Neuroscience, both of the University of Iowa. Previously, Prof. Rizzo was assistant and associate professor of neurology in the University of Iowa College of Medicine. He was also associate professor of industrial engineering in the University of Iowa College of Engineering. Prof. Rizzo is a recognized expert in the association between human factors and the performance of operators of motor vehicles. He is a fellow of the American Neurological Association, received the U.S. Department of Transportation Inaugural Medical Review Board Service Award, has been elected to the American Neurological Association, and is a fellow of the American Academy of Neurology. Prof. Rizzo has served on the following National Research Council study committees: (1) Committee on Human-Systems Integration, (2) the Board on Human-Systems Integration, and (3) the Committee on the Effects of Commuting on Pilot Fatigue. Prof. Rizzo received his A.B. from Columbia University and his M.D. from Johns Hopkins University School of Medicine.

Hal S. Stern

Co-Chair

HAL S. STERN is Ted and Janice Smith Family Foundation dean and professor of statistics, of the Donald Bren School of Information and Computer Sciences, University of California at Irvine. Previously, Prof. Stern was assistant and associate professor of statistics at Harvard University, where he was also director of undergraduate studies in the Department of Statistics, and associate and full professor of statistics at Iowa State University, where he was also director of graduate studies, and where he was Laurence H. Baker chair in biological statistics. His primary areas of research are Bayesian methods, model diagnostics, and statistical applications to biological and social sciences. Prof. Stern is a fellow of the Institute of Mathematical Statistics and the American Statistical Association, and he is a national associate of the National Research Council. He has served as editor of applications and case studies and coordinating editor of the Journal of the American Statistical Association and for CHANCE, and he has served as associate editor of the Annals of Applied Statistics and Bayesian Analysis. Prof. Stern is a current member of the Committee on National Statistics, and he has served as a member or chaired the following studies: Workshop on the Future of Federal Household Surveys, Handling Missing Data in Clinical Trials, ACS Use for NSF Survey of College Graduates, Review the Information Technology Laboratory of the National Institute of Standards and Technology, the American Community Survey, and Evaluation of the Interim Armored Vehicle.
Prof. Stern is a co-author of the leading applied Bayesian text: Bayesian Data Analysis, in its second edition, published by Chapman and Hall. He received his B.S. in mathematics from the Massachusetts Institute of Technology, and his M.S. and Ph.D. degrees in statistics from Stanford University.

Daniel F. Blower

Member

DANIEL BLOWER is associate research scientist with the Vehicle Safety Analytics Group at the University of Michigan Transportation Research Institute. Previous to that, Dr. Blower was an assistant research scientist, and prior to that he was a research assistant, research associate, and then senior research associate at the Transportation Research Institute. He has extensive experience with all the primary national crash data files, and many state crash data files. Medium and heavy trucks have been a primary research emphasis, but he has also directed projects on traffic safety issues related to light vehicles. Dr. Blower’s primary area of research is traffic crash causation. His past projects included investigating the crash experience of younger truck drivers, developing an event tree for heavy truck accidents, and developing statistical models relating vehicle configuration and operating environment to the probability of accident involvement. Dr. Blower received the Best Paper Award in Road Safety at the 2011 Transportation Research Board’s Annual Meeting. He is a member of the Michigan Truck Safety Commission, the Transportation Research Board’s Committee of Truck and Bus Safety, the Technical Advisory Group for American Transportation Research Institute on Truck Drivers Hours of Service study, the Technical Advisory Committee on National Motor Vehicle Crash Causation Study for the National Highway Traffic Safety Administration, and the Large Truck Crash Causation Study Committee for the Federal Motor Carrier Safety Administration. Dr. Blower received his B.A. in history and his Ph.D. in history from the University of Michigan.

Charles A. Czeisler

Member

CHARLES A. CZEISLER (IOM) is the Baldino professor of sleep medicine at Harvard Medical School. Prior to this he was associate and assistant professor of medicine at Harvard Medical School. Prof. Czeisler's research interests include basic and applied research on the physiology of human circadian rhythm and its relationship to the sleep-wake cycle, including the application of sleep science and sleep medicine to occupational medicine/health policy. He is interested in the physiology of the hypothalamic circadian pacemaker in humans, photic and non-photic synchronizers of the human circadian pacemaker, temporal dynamics in neuroendocrine systems, homeostatic and circadian factors in the regulation of sleep and alertness, and the application of circadian physiology to occupational medicine/health policy, particularly as it relates to extended duration work shifts and long work weeks. He has served as consultant to various pharmaceutical companies and as member of Board of Trustees of Institute for Experimental Psychiatry. He has served as president of the Sleep Research Society, he is a fellow of the Clinical Sleep Society, the American Sleep Disorders Association, the Academy of Behavioral Medicine Research, and the American Society for Clinical Investigation, he is an honorary fellow of the Royal College of Physicians, and he is an elected member of the American Clinical and Climatological Association. His many honors include the Lifetime Achievement Award of the National Sleep Foundation, the 2008 Lord Adrian Gold Medal from the Royal Society of Medicine, and the 2008 distinguished scientist award from the Sleep Research Society. Further, he was elected to the Institute of Medicine in 2010. He has served as a member of the editorial boards of Sleep, Sleep Research Online, the American Journal of Medicine, Nature and Science of Sleep, and Sleep and Biological Rhythms. He has served on the NRC Panel on Workload Transition (1989-1992). He received his Ph.D. in neuro-and biobehavioral sciences in 1978 from Stanford University and his M.D. in medicine in 1981 from the Stanford University School of Medicine.

David F. Dinges

Member

DAVID F. DINGES is director, Unit for Experimental Psychiatry, chief, Division of Sleep and Chronobiology, and vice chair for faculty affairs and professional development, in the Department of Psychiatry, University of Pennsylvania School of Medicine. Previously, Prof. Dinges was assistant and associate professor of psychiatry at the University of Pennsylvania School of Medicine, assistant professorial lecturer in the Department of Psychology at the George Washington University, and research instructor in the Department of Child Health and Development at the George Washington University School of Medicine. Prof. Dinges' areas of research are the psychological, cognitive, and functional changes resulting from sleep loss and behavioral stressors in humans, and evaluating the behavioral, pharmacological, and technological countermeasures to these effects. His research is primarily focused on the manner in which neurobiology regulating sleep homeostasis and circadian rhythmicity control cognitive, affective, behavioral, endocrine, and immunological processes in humans. He has over 230 publications, and his scientific work has been funded for 30 consecutive years by agencies such as NIH, NASA, DOD, DOT, and DHS. Prof. Dinges has received the NASA Ames Honor Award (Fatigue Countermeasures Group), the NASA Group Achievement Award (Fatigue Countermeasures Group), Honorary Medal from the Swedish Physicians Society, the NASA TIGR Aviation Safety Award to the Fatigue Countermeasures Project Team, William E. Collins Award (Aerospace Human Factors Association), First Decade of Behavior Research Award from the American Psychological Association, William C. Dement Academic Achievement Award from the American Academy of Sleep Medicine, the NASA Distinguished Service Medal (highest honor NASA awards to a non-governmental employee to individuals whose distinguished accomplishments contributed substantially to the NASA mission), Laurence R. Young Space Biomedical Research Award for Contributions to Human Performance in Space, the Raymond F. Longacre Award for Outstanding Accomplishment in the Psychological and Psychiatric Aspects of Aerospace Medicine, Aerospace Medical Association. In addition, Prof. Dinges is an elected member of the John Morgan Society of the University of Pennsylvania, an elected member of the International Academy of Astronautics, and an overseas fellow of the International Association of Traffic and Safety Societies. Further, Prof. Dinges has served as president of the World Sleep Federation, fellow of the Academy of Behavioral Medicine Research, fellow of the American Physiological Society, fellow of the American Psychological Association, fellow of the Association for Psychological Science, and president of the Sleep Research Society. He has served on the editorial board of SLEEP, as section editor of Sleep Research Online, on the editorial board of Behavioral Sleep Medicine, on the Board of Associate Editors of Aviation, Space, and Environmental Medicine, as deputy editor of SLEEP, and as editor-in-chief of SLEEP. He has served on three NRC studies, the Working Group on Assessment of Community Response to High Energy Impulsive Sounds, the Committee on Optimizing Graduate Medical Trainee (Resident) Hours and Work Schedules to Improve Patient Safety, and the Committee on the Effects on Commuting on Pilot Fatigue. Prof. Dinges received his A.B. from Benedictine College, his M.S. from Saint Louis University in physiological psychology, and his Ph.D. from Saint Louis University in physiological psychology.

Joel B. Greenhouse

Member

JOEL B. GREENHOUSE is professor in the Department of Statistics at Carnegie Mellon University. He is also an adjunct professor of psychiatry, and adjunct professor of epidemiology at the University of Pittsburgh. Prior to being professor, he was associate and assistant professor in the Department of Statistics at Carnegie Mellon University. He has served as associate dean for academic affairs. His areas of research include meta analysis, and biostatistical applications. He has been awarded Statistician of the Year by the Pittsburgh Chapter of the American Statistical Association, fellow of the American Statistical Association, fellow of the American Association for the Advancement of Science, and elected member of the International Statistical Institute. He has served as editor-in –chief for Statistics in Medicine, Associate Editor for Statistics, Politics, and Policy, Associate Editor for the Journal of the American Statistical Association, and editor of IMS Lecture Notes – Monograph Series. He has served as a member of the NRC Committee on National Statistics, the NRC Committee on the Assessment of Family Violence Interventions, and the NRC Panel on the Combination of Information. Prof. Greenhouse received his B.S. in mathematics from the University of Maryland at College Park, and his M.P.H. in biostatistics, his A.M. in statistics, and his Ph.D. in biostatistics all from the University of Michigan.

Feng Guo

Member

FENG GUO is associate professor in the Department of Statistics at Virginia Tech, where he is affiliated with the Virginia Tech Transportation Institute. He was previously assistant professor at Virginia Tech. His primary areas of research are transportation statistics, Bayesian hierarchical models, traffic safety models, spatial statistics, and statistical epidemiology. A particular area of interest is analysis of data from naturalistic driving studies. Prof. Guo has served as member of: (1) the TRB Committee on Statistical Methods, (2) the TRB Committee on Safety Data, and (3) the TRB Subcommittee on Traffic Surrogate Measures. Prof. Guo received his B.S. in highway and traffic engineering and his M.S. in transportation economics and management both from Tongju University, Shanghai, China. He then received his Ph.D. in transportation engineering and his Ph.D. in statistics from the University of Connecticut in Storrs, Connecticut.

Richard J. Hanowski

Member

RICHARD J. HANOWSKI is director, Center for Truck and Bus Safety, and senior research scientist for the Virginia Tech Transportation Institute. Prior to his current position, Dr. Hanowski worked for VTTI as the leader of the truck and bus safety group, and as research scientist for the safety and human factors engineering group. His research has been concentrated on transportation human factors involving both heavy and light vehicles, laboratory and field testing, simulation, advanced system development and testing, naturalistic driving, and human performance evaluation. In particular, he is an expert on distracted driving, particularly pertaining to commercial vehicles. He is the 2012 recipient of the Paul S. Richards Endowed Distinguished Visiting Lecture in Occupational Health. Dr. Hanowski is a current member of the TRB Committee on Trucking Industry Research, and Friend of the TRB Truck and Bus Safety Committee. He served as a member on the NRC Committee for Research on the Health and Wellness of Commercial Truck and Bus Drivers: A Conference. Dr. Hanowski received his B.A. in psychology from the University of Saskatchewan, Saskatoon, Canada, his M.S. in psychology from the University of Idaho, and his Ph.D. in industrial and systems engineering (human factors engineering) from Virginia Polytechnic Institute and State University.

Natalie P. Hartenbaum

Member

NATALIE P. HARTENBAUM is president and chief medical officer of OccuMedix. OccuMedix provides occupational health and safety consulting services, providing expert medical review and litigation support on issues of the ADA and fitness for duty. Previously, Dr. Hartenbaum was medical director of the Consolidated Railroad Corporation, associate medical director for CentraMed Occupational Health Specialists, medical director Industrial Health Care Center, and occupational health physician for Merck and Co. Dr. Hartenbaum completed her residency in occupational and environmental medicine at Thomas Jefferson University Hospital in Philadelphia. She previously served as resident at Tulane University School of Medicine, and at Abington Memorial Hospital in Abington, Pennsylvania. Her areas of expertise are sleep disorders and transportation, and occupational health more broadly. She has served as secretary-treasurer, vice-president, and president of the American College of Occupational and Environmental Medicine, on the Board of Trustees of the American Board of Preventive Medicine, and as president of the Philadelphia Occupational and Environmental Medicine Society. She received the American College of Occupational and Environmental Medicine’s President’s Award. She received her B.A. in biology from Temple University, her M.D. from the Temple University School of Medicine, and her M.P.H. in occupational medicine from the Medical College of Wisconsin.

Gerald Krueger

Member

GERALD P. KRUEGER is head of Krueger Ergonomics Consultants with over 47 years experience as an engineering psychologist and ergonomist conducting, managing, and directing multidisciplinary research and applications work in measurement of worker performance in stressful environments. Previously, he worked as principal scientist / ergonomist and as director of human factors, ergonomics and medical research programs for the Wexford Group. Prior to that he worked for UTEK Corporation, for Star Mountain, Inc., and for Biomechanics Corporation of American. Prior to that Dr. Krueger spent 25 years in the Army, culminating as Colonel, where he worked for the U.S. Army Research Institute of Environmental Medicine, the U.S. Army Aeromedical Research Laboratory, the Walter Reed Army Institute of Research, at Headquarters U.S. Army Medical Research and Development Command, as Medical R&D Command Liaison Officer, and at the U.S. Army Aeromedical Research Laboratory. His primary areas of research are in human factors, human engineering, ergonomics, operator fatigue, and employee health, wellness, and fitness. In particular, he is an authority on the human performance implications of equipment operator fatigue, sleep deprivation, sustained operations, and formulating worker health and wellness programs. He is a fellow of the American Psychological Association, the Human Factors and Ergonomics Society, and the Institute of Ergonomics and Human Factors, and he is an associate fellow of the Aerospace Medical Association. He has also been awarded the Order of Military Medical Merit for Career Contributions to the U.S. Army Medical Department and a presidential citation for military service as a psychologist in the Vietnam conflict. He has served as book review editor for Ergonomics in Design, as associate editor for Military Psychology, as section editor for Aviation, Space, and Environmental Medicine, and as member of the editorial board of the Society for Human Performance in Extreme Environments. He has served on the NRC Panel on Soldier Systems (2007) and the Panel on Soldier Systems (2011). Dr. Krueger has also served on TRB’s Committee on Truck and Bus Safety. He was a major contributor to the TRB Synthesis Report #7 on “Motorcoach industry hours of service and fatigue management techniques.” He received his B.A. in psychology from the University of Dayton, and his M.A. in engineering psychology and his Ph.D. in experimental and engineering psychology from The Johns Hopkins University.

Melissa M. Mallis

Member

MELISSA M. MALLIS is president and chief scientist of M3Alertness Management, chief scientific advisor for Alertness Solution, and senior science advisor for DB&A. Dr. Mallis is also a fellow at George Mason University, in the Center for Infrastructure Protection and Homeland Security. Prior to these positions, Dr. Mallis served as chief scientist for operational and fatigue research at the Institutes for Behavioral Resources (IBR). Prior to that, Dr. Mallis was the director, scientific affairs for Alertness Solutions. Her area of expertise is the development of innovative, practical, and effective strategies to enhance safety, performance, and alertness in many different 24/7 operational environments. Dr. Mallis has received more than one NASA superior performance award, and more than one NASA performance incentive award; she has received the Arnold D. Tuttle award for “Original Research that has Made the Most Significant Contribution Toward the Solution of a Challenging Problem in Aerospace Medicine;” and she has received three times the William E. Collins award for the “Outstanding Human Factors Publication of the Year.” Dr. Mallis has served as review committee chair for research evaluating the 34-hour and 58-hour restarts study for the Federal Motor Carrier Safety Administration. She received a B.S. in physics from Villanova University and a Ph.D. in biomedical science from Drexel University.

John P. Pearson

Member

JOHN R. PEARSON is program director, Council of Deputy Ministers Responsible for Transportation and Highway Safety, Ottawa, Ontario, where he is responsible for developing, managing, and conducting research and policy development programs for the Council of Deputy Ministers. Prior to that, Mr. Pearson was consultant to the same office, and prior to that he was executive director of the Canadian Trucking Research Institute, director of technical programs for the Transportation Association of Canada, director of research for the Western Highway Institute, and project manager, Vehicle Weights and Dimensions Study, Canroad Transportation Research Corporation. His areas of expertise include highway safety, especially weights and dimensions policies, and research on safety using naturalistic driving techniques. He has twice received the Roads and Transportation Association of Canada Chairman’s Award. He has served on three previous NRC study committees: (1) Oversight Committee for the Strategic Highway Research Program 2 (SHRP 2), (2) Committee for the Study of the Regulation of Weights, Lengths, and Widths of Commercial Motor Vehicles, and (3) Committee for the Study of the Regulation of Weights, Lengths, and Widths of Commercial Motor Vehicles. Mr. Pearson received his Bachelor of Engineering degree from Carleton University.

Dylan Small

Member

DYLAN SMALL is associate professor in the Department of Statistics at the Wharton School in the University of Pennsylvania. He was previously assistant professor. Prof. Small also is a senior fellow at the Leonard Davis Institute of Health Economics and associate scholar in the Biostatistics Unit of the Center for Clinical Epidemiology and Biostatistics at the University of Pennsylvania School of Medicine. His areas of research include causal inference, the design and analysis of observational studies, and applications of statistics to public health, medicine, and public policy. He is a fellow of the American Statistical Association. He has served on the editorial boards of Biometrics, Evaluation Review, Journal of Educational and Behavioral Statistics, Journal of the American Statistical Association, The American Statistician, Journal of Causal Inference, and Journal of the Royal Statistical Society, Series B. Prof. Small received an A.B. in mathematics from Harvard, and a Ph.D. in statistics from Stanford University.

Elizabeth A. Stuart

Member

ELIZABETH A. STUART is associate professor of statistics in the Department of Mental Health and the Department of Biostatistics both in the Johns Hopkins Bloomberg School of Public Health. Prior to that she was assistant professor, and prior to that she was a researcher at Mathematica Policy Research. Prof. Stuart’s primary areas of research include statistical methodology for mental health research, particularly relating to causal inference and missing data. She also works more generally in the areas of education, prevention, and intervention using techniques such as multi-level modeling, matching, and propensity scores. She has served as associate editor of The Journal of the Royal Statistical Society, Series A, the Journal of Causal Inference, Sociological Methods and Research, Statistics in Medicine, and the Journal of Educational and Behavioral Statistics. Prof. Stuart received her A.B. in mathematics and chemistry from Smith College, and her A.M. and Ph.D. in statistics from Harvard University.

David H. Wegman

Member

DAVID H. WEGMAN is professor emeritus at the School of Health and Environment at the University of Massachusetts at Lowell. He is also a fellow of the American College of Epidemiology. For twelve years he consulted with the United Auto Workers/General Motors Occupational Health Advisory Board, serving as chair, and he has served on or is serving on more than 15 NRC committees (he is a national associate of the National Academies). These include: the Board on Human-Systems Integration; the Committee on Aerospace Medicine and Medicine of Extreme Environments; the Committee on Department of Homeland Security Occupational Health and Operational Medicine Infrastructure; the Committee on Mine Safety: Essential Components of Self-Escape; and the Committee on Offshore Windfarm Worker Safety. Professor Wegman has also served as contributing editor for the American Journal of Industrial Medicine, and as a member of the editorial board of the Journal of Occupational Health Psychology, and the International Journal of Occupational and Environmental Health. He was awarded the Alice Hamilton Lifetime Achievement Award—Occupational Health and Safety Section, American Public Health Association. He has a B.A. degree in history from Swarthmore College, an M.S. degree in occupational health from the Harvard School of Public Health, and an M.D. degree from Harvard Medical School.