Exponent®
Engineering & Scientific Consulting

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Professional Profile

Dr. Fowler specializes in issues related to both on-road and off-road vehicles, including handing and stability, component evaluation and testing, accident reconstruction, crash testing, patents, and risk analysis. He has experience working on automobiles, light trucks/SUVs, on- and off-road motorcycles, All-Terrain Vehicles (ATVs), Recreational Off-Highway Vehicles (ROVs) or side-by-sides, golf carts and construction/industrial equipment.

While at Exponent, Dr. Fowler has gained extensive experience operating, testing and evaluating ATVs and side-by-sides focusing on handling and stability, general operation, analysis of accident records and data, comparative risk analysis and accident reconstruction. Dr. Fowler has evaluated proposed design modifications for ATVs, conducted instrumented testing of off-road motorcycles to investigate component performance under dynamic loading and, has experience analyzing computer simulations aimed at modeling off-road vehicle dynamic behavior.

Dr. Fowler also has experience reconstructing passenger vehicle rollover crashes and analyzing the causes of loss of control through vehicle testing, analysis of crash data files and, review of driver performance data and literature. At Exponent, he has been involved with rollover crash tests and conducted vehicle handling and stability test programs utilizing standardized procedures or specialized tests to evaluate case-specific circumstances. In addition, Dr. Fowler has experience both using and analyzing computer software for vehicle dynamics and accident reconstruction.

Prior to his work with Exponent, Dr. Fowler was a Junior Lecturer at the University of Auckland, New Zealand.

Academic Credentials & Professional Honors

Ph.D., Applied Mechanics, California Institute of Technology (Caltech), 1982

M.E., Engineering Science, University of Auckland, 1978

B.E., Engineering Science, University of Auckland, 1976

Professional Affiliations

Society of Automotive Engineers (member)

American Society of Mechanical Engineers (member)

Publications

"Perception of Terrain Slope in Real and Virtual Environments," AHFE 2020 Springer Conference Proceedings, Paper 1377 (with Lester, B., Larson, R., Dosch, I., Fowler, G. and Rauschenberger, R.).

Frank, T., Fowler, G., Garman, C, and Sharpe, S., "Motorcycle Rider Inputs During Typical Maneuvers," SAE Technical Paper 2020-01-1000, 2020.

Garman CMR, Sharpe SS, Frank TA, Fowler TA. Motorcycle Rider Kinematics during Low and High Speed Turning Maneuvers. SAE Technical Paper 2018-01-0536, 2018.

"All-Terrain Vehicle (ATV) Handling and Control, Analysis of Objective Data," SAE Int. J. Veh. Dyn., Stab., and NVH 1(2):2017, doi:10.4271/2017-01-1557 (with R. Larson).

"An Investigation of Operator Performance in All-Terrain Vehicle (ATV) Handling and Control," 6th International Conference on Applied Human Factors and Ergonomics (AHFE 2015), Procedia Manufacturing 2015; 20:1567-1574 (with J. Schwark, R. Larson and R. Rauschenberger).

"An Examination of Motorcycle Antilock Brake Systems (ABS) in Reducing Crash Risk," Proceedings of the ASME 2014 International Mechanical Engineering Congress & Exposition, IMECE2014-36910, November 2014, Montreal, Canada (with R. Ray, S. Huang, K. Zhao and, T. Frank).

"Testing and Analysis of Autonomous Emergency Braking Systems using the Euro NCAP Vehicle Target," Proceedings of the ASME 2014 International Mechanical Engineering Congress & Exposition, IMECE2014-39084, November 2014, Montreal, Canada (M. Schwall, J. Neal, C. Retallack and, R. Larson).

"Recreational Off-Highway Vehicle (ROV) Handling and Control," SAE Technical Paper Series 2012-01-0239, Society of Automotive Engineers (SAE) World Congress, 2012 (with J. Brown, R. Larson and, S. Kuhn).

"Biomechanics of Occupant Responses during Recreational Off-Highway Vehicle (ROV) Riding and 90-degree Tip-overs," SAE Technical Paper Series SAE 2012-01-0096, Society of Automotive Engineers (SAE) World Congress, 2012 (with W. Newberry, M. Carhart M, R. Larson, A. Bridges A).

"Simulating Moving Motorcycle to Moving Car Crashes," SAE Technical Paper Series, 2012-01-0621, Society of Automotive Engineers (SAE) World Congress, 2012 (with T. Frank, J. Smith and, J. Carter).

"Full-Scale Moving Motorcycle into Moving Car Crash Testing for Use in Safety Design and Accident Reconstruction," SAE Technical Paper Series, 2012-01-0103, Society of Automotive Engineers (SAE) World Congress, 2012 (with J. Smith, T. Frank, K. Bosch and, Carter JW).

"Single-Vehicle Rollovers Involving an Initial Off-Roadway Excursion Followed by a Return to Roadway: A NASS Study and Vehicle Response Measurement," SAE Technical Paper Series, 2008-01-0159, Society of Automotive Engineers International Congress and Exposition, Detroit, MI, 2008 (with R. Larson, M. Kuzel, A. Stubbs, J. Brown and, A. Donelson).

"Driver Crash Avoidance Behavior: Analysis of Experimental Data Collected in NHTSA's Vehicle Antilock Brake System (ABS) Research Program," SAE Technical Paper Series, 2005-01-0423, Society of Automotive Engineers International Congress and Exposition, Detroit, MI, 2005 (with R. Larson and L. Wojick).

"Vehicle Rollover Testing, Methodologies in Recreating Rollover Collisions," SAE Technical Paper Series, 2000-01-1641, SAE Automotive Dynamics & Stability Conference, Troy, MI, May 15-17, 2000 (with R.E. Larson, J.W. Smith, and S.M. Werner).

"Slope Perception and Slope Warnings," Proceedings of the Silicon Valley Ergonomics Conference and Exposition, pp. 156-159, 1997 (with T.J. Ayres, V.M. Bjelajac, and D.E. Young).

"Reaction Time for ATV Operation," presented at Cyberg, The First International Cyberspace Conference on Ergonomics, http://www.curtin.edu.au/conference.cyberg, 1996 (with D.E. Young, T.J. Ayres, and V.M. Bjelajac).

"Foot Injuries and Foot Protection on All-Terrain Vehicles," Proceedings, American Society of Mechanical Engineers Winter Annual Meeting, SERA-Vol. 2, Safety Engineering and Risk Analysis, November 1994 (with T.J. Ayres, R.L. McCarthy, and R. Merala).

"Steady-State and Transient Response of Selected All-Terrain Vehicles (ATVs)," SAE 940277, Society of Automotive Engineers International Congress and Exposition, Detroit, MI, February 1994 (with R.H. Fries et al.).

"Evaluation of a Proposed ATV Design Modification," SAE 940276, Society of Automotive Engineers International Congress and Exposition, Detroit, MI, February 1994 (with R.L. Piziali et al.).

"An Examination of the Consent Decree and Its Impact on All-Terrain Vehicle Risk," Proceedings, American Society of Mechanical Engineers Winter Annual Meeting, New Orleans, LA, Safety Engineering and Risk Analysis, Vol. 1, p. 155-161, November 1993 (with R.L. McCarthy, T.J. Ayres, and M.M. Gross).

"A Comparative Analysis of the Annual Injury Risk for Motorized Vehicular Recreation," American Society of Mechanical Engineers Winter Annual Meeting, New Orleans, LA, November 1993 (with C.T. Wood, R.L. McCarthy, and J.N. Robinson).

"Investigation of the Net Safety Impact of an Occupant Protection System for All-Terrain Vehicles," SAE 930208, Society of Automotive Engineers International Congress and Exposition, Detroit, MI, March 1993 (with R.L. Piziali et al.).

"Evaluation of an Occupant Protection System for All-Terrain Vehicles," Society of Mechanical Engineers Winter Annual Meeting, Anaheim, CA, November 1992 (with R.L. Piziali et al.).

"Evaluation of Potential Safety Modifications by Review of Accident Reports," 35th Annual Meeting of the Human Factors Society, San Francisco, CA, Sept. 1991 (with T.J. Ayres et al.).

"Three-Dimensional Finite Element Analysis of a Scale Model Nuclear Containment Vessel," Journal of Pressure Vessel Technology, Transactions of the ASME, Vol. 108, p. 320, August 1986 (with G. Derbalian and J.M. Thomas).

"Finite Plane and Anti-Plane Elastostatic Fields with Discontinuous Deformation Gradients Near the Tip of a Crack," Journal of Elasticity, Vol. 14, 1984.

"A Review of Fracture Mechanics Life Technology," Failure Analysis Associates Report to National Aeronautics and Space Administration, September 1983 (with P.M. Besuner, D.O. Harris, and J.M. Thomas).

"Average Operator Inaction Characteristics with Lever Controls--Study of the Column Mounted Gear Selector Lever," 26th Annual Meeting of the Human Factors Society, Seattle, WA, October 1982 (with R.L. McCarthy, J.P. Finnegan, and S.B. Brown).

"The Harmonic Excitation of a Cylindrical Bar Embedded in an Elastic Half-Space," Abstract from Modern Problems in Elastic Wave Propagation, Wiley Interscience, 1978 (with G.B. Sinclair).

"The Longitudinal Harmonic Excitation of a Circular Bar Embedded in an Elastic Half-Space," International Journal of Solids and Structures, Vol. 14, No. 12, 1978 (with G.B. Sinclair).

"The Dynamic Response of Embedded Piles Under Vertical Loading," Proceedings, 6th Australian Conference on Mechanics of Structures and Materials, Christchurch, New Zealand, 1977 (with G.B. Sinclair).

Presentations

"Characteristics and Dynamics of Light Truck "First-Event, On-Road" Rollovers," Presentation, SAE International Congress and Exposition, February 1998.

"Rollover Causal Analysis," Passenger Car Rollover, SAE TOPTEC, San Diego 1999.

Reports

"Driver Crash Behavior in an Intersection Incursion Scenario, Analysis of Experimental Data Developed as Part of NHTSA's Light Vehicle Antilock Brake System (ABS) Research Program," Exponent Report #PH07264.000/A0T0/1102/R451, November 2002 (with R. Larson and L. Wojcik).

"All-Terrain Vehicle Handling and Control," Exponent Report 1404606-1973, March 2015, Prepared for the Federal Chamber of Automotive Industries (FCAI), Australia.

Additional Education & Training

Motorcycle Crash Reconstruction, Northwestern University Center for Public Safety, 2013

HVE Forum, February 2011

Motorcycle Safety Foundation Basic Rider Course, 2010

Passenger Vehicle Rollover TOPTEC: Causes, Prevention and Injury Prevalence, Scottsdale, AZ, 2002

Passenger Car Rollover, SAE TOPTEC, San Diego, CA, 1999

Vehicle Rollovers, SAE TOPTEC, Dearborn, MI, 1993