

Matthew Schwall, Ph.D., P.E.
Managing Engineer

Professional Profile

Dr. Matthew Schwall is a Managing Engineer in Exponent's Vehicle Engineering practice. He specializes in accident reconstruction and also analyzes the design of consumer and industrial products. Dr. Schwall has reconstructed on- and off-road accidents involving cars, trucks, motorcycles, ATVs, bicycles, and pedestrians. His design and failure analysis investigations have included automotive and bicycle components, medical devices, small appliances, computer hardware, and cranes. He also has experience with intellectual property litigation.

Dr. Schwall is trained in the download and analysis of electronic crash module data. He also has experience modeling and testing airbags and airbag controllers, as well as experimentally identifying vehicle tire and suspension properties.

Dr. Schwall has a background in dynamics, controls, and signal processing and has worked in the automotive industry in both Michigan and Germany. Prior to joining Exponent, Dr. Schwall held research and teaching positions at Stanford University, where his research focused on probabilistic diagnostics of automotive dynamics and included the development of an improved method for decision analysis. He assisted in the teaching of courses on vehicle dynamics and system identification.

Academic Credentials and Professional Honors

Ph.D., Mechanical Engineering, Stanford University, 2005
M.S., Mechanical Engineering, Stanford University, 2001
B.S., Mechanical Engineering, Stanford University (with Distinction), 1999

Phi Beta Kappa; Tau Beta Pi

Licenses and Certifications

Registered Professional Mechanical Engineer, California, #M34033

Additional Training

Traffic Accident Reconstruction Course, Northwestern University—Center for Public Safety.

Certified Vetronix Crash Data Retrieval System Technician and Data Analyst, Collision Safety Institute.

Bendix Brake Training School

Publications

Schwall M, Wilson J, Mattison D. Post-impact examination of HID headlamps. 2010 Society of Automotive Engineers (SAE) World Congress, SAE Paper No. 2010-01-0056.

Schwall M, Gerdes JC. Automotive diagnostic decisions using probabilistic information. ASME International Mechanical Engineering Congress and Exposition (IMECE 2005), Orlando FL, November 2005.

Schwall M, Gerdes J C. Residual autocorrelation in probabilistic model-based diagnostics. ASME International Mechanical Engineering Congress and Exposition (IMECE 2005), Orlando FL, November 2005.

Schwall M. Dynamic integration of probabilistic information for diagnostics and decisions. Doctoral Dissertation, Stanford University, Stanford CA, September 2005.

Schwall M, Gerdes J C, Bäker B, Forchert T. A probabilistic vehicle diagnostic system using multiple models. 15th Innovative Applications of Artificial Intelligence Conference (IAAI-03), Acapulco, Mexico, August 2003.

Schwall M, Gerdes J C. A probabilistic approach to residual processing for vehicle fault detection. 2002 American Controls Conference (ACC 2002), Anchorage, AK, June 2002.

Schwall M, Gerdes J C. Multi-modal diagnostics for vehicle fault detection. 2001 ASME International Mechanical Engineering Congress and Exposition (IMECE 2001), New York, NY, November 2001.

Hayward R C, Gebre-Egziabher D, Schwall M, Powell J D, Wilson D. Inertially aided GPS based Attitude Heading Reference System (AHRS) for general aviation aircraft. 10th International Technical Meeting of the Satellite Division of the Institute of Navigation (ION GPS-97), Kansas City, MO, September 1997.

Prior Experience

Guest Researcher, DaimlerChrysler AG, 2003

Engineer, General Motors, 1999

Engineer, Volkswagen AG, 1998

Professional Affiliations

- American Society of Mechanical Engineers (member)
- Society of Automotive Engineers (member)