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Professional Experience

- **2001-Present.** Argonne National Laboratory
 - **2005-Present.** Lead Fuels Engineer. Assigned to expand the alternative fuels research program at Argonne National Laboratory and coordinate efforts between program managers at the U.S. Department of Energy (DOE) and the researchers at Argonne along with the efforts of the automotive and alternative fuels industries.
 - **2005-Present.** Omnivorous Engine Project. Principal Investigator in charge of developing a flexibly fueled engine that is capable of sensing combustion characteristics in cylinder and optimizing the engine's performance for the fuel characteristics/blends present.
 - **2007-Present.** E15, E20 Vehicle Testing. Principal Investigator from Argonne and responsible for testing three of the nine vehicles as well as designing and building the specialized equipment for the study of the non-regulated emissions (aldehydes and other air toxics) during the testing of the nine vehicles and the small non-road engines in the study.
 - **2004-Present.** Society of Automotive Engineers (SAE) Fellow to United States Council for Automotive Research (USCAR). Managed and developed three Advanced Manufacturing Technical Teams (AMTTs).
 - **2003-Present.** Principal Investigator responsible for the testing of the Electro-Motive Diesel, Inc. (EMD) 710 locomotive engine test program. Program goal is to meet the U.S. Environmental Protection Agency (EPA) Tier 2 and Tier 3 emissions standards using the EMD 710 two-stroke engine.
 - **2003-Present.** Principal Investigator responsible for the Locomotive Common Rail Injection Fuel Spray Visualization Testing Program.
 - **2003-Present.** Principal Investigator responsible for developing a variable composition intake air system for the reduction of oxide of nitrogen emissions in natural gas engines.
 - **2002.** Co-chair for the "National Laboratory compression-ignition direct-injection (CIDI) and Fuel R&D Merit Review and Peer Evaluation" meeting.
 - **2001-2005.** Principal Investigator for the Mack Truck Cooperative Research and Development Agreement "Nitrogen Enriched Intake Air for the Reduction of NO_x Emissions in Heavy Duty Diesel Engines."
- **1998-2001.** Project Engineer, Automotive Testing Laboratories, Inc.

- **1997-1998.** Hardware Engineer, Lockheed Martin Corporation
- **1995-1997.** Engineering Scientist, West Virginia University
- **1993-1995.** Graduate Research Assistant, West Virginia University
- **1992-1993.** Senior Project-Formula SAE Competition, West Virginia University
- **1989-1991.** Draftsman/Designer, Daedalean Inc.

Education

- MS, Mechanical Engineering, West Virginia University, 1995
- Passed the Engineer-in-Training (EIT) exam on July 12, 1993
- BS, Mechanical Engineering, West Virginia University, 1993

Career Highlights

- Argonne was part of a three lab partnership to study the effects of enhanced ethanol blends (E15 and E20) on the in-use vehicle fleet along with small non-road engines. The labs participating in this study were Argonne, Oak Ridge National Laboratory and the National Renewable Energy Laboratory. Acted as Principal Investigator from Argonne, responsible for testing three of the nine vehicles and designing and building the specialized equipment for the study of the non-regulated emissions (aldehydes and other air toxics) during the testing of the nine vehicles and the small non-road engines in the study. The study resulted in a DOE report "Effects of Intermediate Ethanol Blends on Legacy Vehicles and Small Non-Road Engines, Report 1."
- Managed and developed three AMTTs. These teams were assembled and developed with technical guidance from the Manufacturing Technical Leadership Council and the SAE Fellow at USCAR.
- Active in the Advanced Combustion and Emissions Control Technical Team (ACEC), aided the ACEC Technical Team by gathering information for presentations and peer reviews, as well as gathering data and benchmarking progress toward achieving the DOE's FreedomCAR and Vehicle Technologies Program Technology Roadmap goals.
- Liaison between DOE and the Fuels Working Group to enhance the communication between DOE and the Fuels Working Group.
- Performed a study on Minnesota's E20 initiative and presented a report to both USCAR and the DOE. During this time, expanded contacts in the Alternative Fuels Production Community to include key organizations such as the Renewable Fuels Association and industrial contacts such as Sasol. This E20 initiative report helped convince the DOE that they should go forward with their Enhanced Ethanol Blends Initiative and that Argonne should be a key player in that initiative.
- In 2008 used contacts at USCAR to obtain eight proprietary engine maps for use in the Powertrain Systems Analysis Toolkit model. The engines were all new state-of-the-art engines that used technologies such as variable geometry turbochargers, variable valve timing, and cylinder

deactivation. Along with the advanced technologies, engine maps based on alternative fuels such as ethanol and butanol were supplied.

Professional Society Activities

- Society of Automotive Engineers
 - Member of the Heavy Duty Hybrid Testing (J2711) Standards Committee
 - Organizer and Chairperson of the SAE Diesel Emissions Session for 2002 Spring Fuels and Lubricants Conference
 - Chairperson of the Real-World Emissions Measurement Session for 2002 Spring Fuels and Lubricants Conference
 - Organizer and Chairperson of the SAE Diesel Particulate Matter Emissions Session for 2003 Fall Fuels and Lubricants Conference
 - Judge for the 2008 Challenge X Student competition (written reports)
- American Society of Mechanical Engineers
 - Chairperson of the 2008 ASME Internal Combustion Engines (ICE) Conferences Alternate Fuels Session
 - Track Chair of the Fuels and Combustion Track which encompasses fuel sprays, engine simulation, advanced combustion and advanced engine design sessions of ASME's 2008 ICE conference

Publications & Patents

- Publications: 8 Peer-Reviewed Conference Papers
- Patents: 1