

Mark M Koeroghlian

Accomplished mechanical engineer with analytical, design and development skills who possesses a thorough understanding of a broad range of technical topics. Recognized for ability to quickly develop expertise in new topics. Demonstrated capability to both work within and lead culturally diverse technical teams to successful product development. Recognized for exceptional problem solving skills and attention to detail.

EDUCATION

MSME, *University of Texas, Austin, TX, 1987*

BSME (with honors), *University of Texas, Austin, TX, 1982*

PROFESSIONAL DEVELOPMENT

- General Motors Powertrain: Base Engine Design Class (104 hours)
- Systems Engineering Courses

AWARDS

[2006 Walter P. Chrysler Technology Award, First Place, with Joel A. Baker, Michael A. Bonne, Eugenio DiValentin, Mark J. Duty, Alan G. Falkowski, Constantin Hagiu, et. al.](#)

COMPETENCIES

- | | | |
|------------------------|-----------------------|---------------------|
| • Technical Leadership | • System Design | • Mechanical Design |
| • Problem Solving | • Sensor Integration | • Data Analysis |
| • Moisture Control | • Incompressible Flow | • Sealing Systems |
| • Combustion Systems | • Psychrometry | • Failure Analysis |
| • SolidWorks | • FlowWorks (CFD) | • MS Excel |

EXPERIENCE

2011-Present

- Principal Investigator for development of a planetary style traction drive CVT to control the velocity of an alternator on a military vehicle.
- Principal Investigator for fuel economy benefits analysis of using continuously variable accessory drives in military vehicles.
- Principal Investigator for development of a planetary style traction drive continuously variable transmission for controlling the velocity of an engine cooling fan on a military vehicle.
- Served as expert witness for patent infringement involving “Mud” boats
- Designed instrument rack panels for Air-Force preflight test equipment.

2004-2011

- Led successful development effort of quick release mechanism for military vehicle camera system mount (patent pending).
- Designed vibration fixtures for environmental stress screening of optoelectronic enclosures for military vehicles.
- Analyzed thermal characteristics (time constants) of optoelectronic enclosures in support of environmental stress screening to reduce manufacturing cycle time.

- Developed expertise in moisture control for sealed optoelectronic enclosures to minimize design complexity and cost while ensuring adequate performance in relevant environments.
- Successfully migrated product line leak testing from water submersion and human bubble observation to instrumented pneumatic pressure decay.
- Developed Excel based o-ring selection tool for corporate usage.
- Led development of a pyrotechnic technology to anchor slender poles (~60:1 aspect ratio) into a wide range of ground substrates (packed sand to concrete) from a moving vehicle without engaging the substrate surface. The poles contained an inertially switched LED for nighttime illumination.
- Mechanical design lead and co-system architect for mission equipment package for autonomous minefield clearing system consisting of mine detection, mine neutralization and lane marking. Performed systems level analyses to distribute requirements among subsystems.
- Experimentally investigated the effect of adding a small amount of hydrogen to gasoline in a homogeneous charge, spark ignition engine for the purpose of increasing the burn rate. Also studied the effect of heating gasoline fuel prior to (port) injection on a naturally aspirated, spark ignition engine.
- Evaluated the benefit of reducing the mass of an existing ground penetrating radar panel for automatic height control and developed a concept for achieving the mass reduction.
- Faculty advisor to undergraduate students working on senior design projects at UT.

2000-2004

- Led the successful redesign effort to ruggedize and miniaturize a flow cytometer based on an existing commercial instrument from [Luminex Corp.](#)
- Lead mechanical and systems engineer and lead analyst for hand-held chemical warfare agent (CWA) detector.
- Developed pneumatic system model for mechanical components requirements definition of handheld CWA detector.
- Supervised junior engineers during experimental correlation of model parameters and design of injection molded fluoropolymer and nylon components for CWA detector.
- Developed expertise in filtration for pneumatic systems. Developed a disposable, easily changeable (with [MOPP](#) gear) filter for CWA detector. Filter was comprised of expanded PTFE filtration media over-molded with polyamide holder. Filter was secured/sealed to detector with o-ring to withstand water submersion to ~30 inches.
- Co-lead for system functional performance analysis of CWA detector.
- Developed a small pre-concentrator unit for CWA detector. Unit operated on principle of thermal adsorption/desorption using [Tenax-TA](#). Developed expertise of flow through pack beds as well as adsorption/desorption to support this design effort.
- Provided technical interface to customer for both mechanical hardware and systems functionality issues for CWA detector.
- Developed a magnetically operated excess flow valve for residential natural gas service. Valve was patented and successfully commercialized by Brass Craft. Analyzed diffusion of natural gas into residential living space for the purpose of defining an acceptable leak rate.

1997-1999

- Co-developed basic architecture for modern day Chrysler [Hemi](#) engine.
- Evaluated and selected technologies to meet performance, fuel economy and weight objectives of Chrysler Hemi engine.
- Project manager of the Chrysler Hemi engine block assembly.

- Developed and tracked program timing, specification of design requirements and design criteria, release of design, and management of suppliers and internal design services to meet program timing.
- Developed a method of measuring cylinder bore wall thickness to drive minimum bore spacing on the new Chrysler Hemi engine.
- Led a geographically and culturally diverse team of engineers to produce the prototype modern Hemi engine block on time and within budget. Created block design framework for \$90M production machine line. Ten member team consisted of a Mexican foundry, US prototype machine shop, German production machine line maker, US component manufacturer and internal design and modeling support.
- Project manager for Multi-Displacement System on the new Chrysler Hemi engine. Program schedule was critical to minimize impact on engine block machine line cost.
 - Provided systems expertise and led an international and remote team of engineers to produce an economically and functionally optimized system. This system was highly integrated into the engine block. Team consisted of multinational component makers, consulting firms, and internal design and modeling support.

1994-1997

- Supervised development of data processing and analysis software to streamline evaluation of engine test data.
- Utilized problem-solving skills to trouble-shoot production problems related to engine performance. (e.g., solved a systemic idle stability problem on GM's 1999 2.4L Twin Cam engine).
- Assessed performance of engine systems (valve train, crankcase ventilation, fuel injection, spark ignition...).
- Developed a commercially available custom spark plug (with Champion Spark Plug Co.) incorporating cylinder access for piezoelectric pressure transducer mounting.
- Evaluated pressure transducer technologies and provided corporate usage recommendations.
- Developed laboratory test operations guide and test procedures for engine combustion system development to standardize data collection.
- Analyzed competitive engine database for engine technology trends and reported results to combustion community within GM.
- Identified a previously unreported correlation between combustion stability and NO_x emissions.
- Responsible for inclusion of VVT system on GM's DOHC inline 6-cylinder engine.

PUBLICATIONS

"*Initial Studies of a New Type of Igniter: the Railplug*", with M.J. Hall, H. Tajima, R.D. Matthews, S.P. Nichols, and W.F. Weldon, [SAE Technical Paper 912319](#), 1991.

"*Experimental Investigation of a Staged Porous Ceramic Burner*," with R.D. Bell and C.A. Chaffin, presented at the International Conference on Environmental Control of Combustion Processes, Oct 1991.

"*Experimental Investigation of Premixed Combustion within Highly Porous Media*," with C.A. Chaffin, M.H. Koenig, R.D. Matthews, M.J. Hall, and S.P. Nichols, ASME/JSME Thermal Engineering Proceedings 4:219-224 (1991).

"*Development of a Computationally Fast Equilibrium Equivalent 4-Stroke SI Engine Model*," with R.D. Matthews and Y-W. Chin, [SAE Technical Paper 880130](#), 1988.