David A. Peter

Education

1972 - 1977	General Motors Institute Flint, Mi. Bachelor of Electrical Engineering
2009 - 2014	Purdue MSECE focus on Power Electronics 3.933 GPA
1978 - Present	Numerous Short Courses

Employers

1972 - 2004	Delphi-E Anderson, In (Formerly Delco Remy division of General Motors)
2006-2007	Contract
2007	IUPUI
2008	Contract
2008-2014	Purdue
2009-present	Consulting
2014-2016	SMC
2016-2018	Borg Warner
2018-present	PC Krause and Associates

Accreditations

Professional Engineer in Indiana since Aug 1981
Shainin Master Certification in Dec 1996
Delphi Innovation Hall of Fame Inductee Sep 1999, Bronze Award in 2006
Shainin Red X Reliability Certification Mar 2002
Delphi 6-Sigma Black Belt Certification Sep 2003
Private Pilot SEL May2018 IFR Feb2024

Professional memberships

IEEE Life Senior Member (Institute of Electrical and Electronics Engineers)
PES (Power & Energy Society), PELS (Power Electronics Society)
SAE (Society of Automotive Engineers)
AIAA (American Institute of Aeronautics and Astronautics)

Patents and publications

Inducted into Delphi Innovation Hall of Fame 1999 and awarded Bronze status in 2006. Have 8 patents granted, 10 defensive publications, and 2 trade secrets in areas of Ultrasonic Welding, Alt-Star (Alternator-Starter mechanizations), Battery Equalization, Flywheel Alt-Star, and Active Bridge for Lundell Machines. Published “Simple Algorithm for Chlorine Concentration Control” IEEE GHTC for the control of chlorinators in third world countries.

Summary of qualifications

A broad experience base, which includes:

Assembly Tooling	Internal Combustion Engines
Systems Engineering	Machine Controls
Automotive Electrical Systems	AC Machine Control
Battery manufacturing	AC Machine Design
Waste and Scrap Reduction	Battery Controls
Material Joining	Power electronics
Product Engineering	Warranty and Quality Problem Solving
Aircraft (pilot and mechanic)	

Experience by Area

Engine Management
- Designed and built proof of concept ignition timing controller to obtain real time MBT based on engine torque.
- Am familiar with EGR, EFI, VVT, and VIT concepts and applications.
- Have run engine dynamometers.

Battery Management
- Designed and built adaptive cycling equipment for NiZn and Pb Acid battery development.
- Developed an autonomous battery string equalization circuit using switch mode power processing.
- Designed a prototype LiPo data acquisition system for lab packs.
- Developed several Ultrasonic Welds for cell tabs.
- Participated in battery pack design and testing for EV1, Hybrid bus, Class 8 truck, and Grid Stabilization.

Ultrasonic Weld Control
- Pioneered hardware and control techniques that were later adopted by the industry and are widely used today. Was able to optimize various types of welds using this hardware and designed experiment techniques. Both plastic and metal welders used variants of these techniques. This included copper/copper, aluminum/aluminum, copper/aluminum, and tab welds on various kinds of batteries & cells.

Power Electronics & Machines
- Designed the control loop for switch mode power supply used for battery string forming.
- Upgraded 4kW resonant commutated power supplies using simulation and stress analysis that resulted in greatly improved uptime and reliability.
- Designed and helped build proof of concept Flywheel Alternator/Starter. Later versions became full hybrid designs.
- Developed inverter fed Lundell machines and followed first design through the Advanced Development Process. Later versions became high power generators and start/stop soft hybrids.
- Participated as full time team member of Future Electrical Power Systems group (joint activity between GM research, Cadillac, and Delco Remy)
- Lead System engineer for 20kW integrated 48V machine
- uC software and testing for phase lock inverter and DC-DC TPS converters

Control Design
- Designed low cost innovative process control for inductance set of coils.
- Designed and programmed industrial microprocessor for welders.
- Designed and programmed initial starter-generator microprocessor system for proof of concept.
- Developed an embedded u-Controller for an engine mounted device which had to live with 150C transients.
- Developed u-Controller for small battery management device
- Developed Controller for third world chlorinators, many currently in operation
- Wrote uC code for phase locked scr rectifier and line inverter
- Wrote uC code for Triple Phase Shift DC-DC converter

Problem Solving
- Improved uptime of ultrasonic welders.
- Significantly improved scrap rates of several Delphi departments, usually cut in half or better.
- Coached Shainin teams for GM warranty reduction.

Leadership and Project Management
- Group leader for the material joining section and lab of Process Engineering.
- Led the Auxillary Power System group for the GM Electric Vehicle at Delco Remy. That group designed the power electronics for systems other than the main inverter. Before taken over by Hughes, attention to detail and stress created units with very high reliability.
- Led a small focused team to reduce scrap in a high cost department. Made significant progress in scrap cost, throughput, and warranty cost.
- Coached teams to reduce Corporate Warranty and Production Costs from 93-96. Saved in excess of 35 M$ during this time period.
- Taught as adjunct at both IUPUI and Purdue

Teaching & Academic
- ECET 157 – Electronics Circuit Analysis Fall Semester 2007 IUPUI
- ECET 109 – Digital Fundamentals Spring 2009 & 20011 Purdue Anderson
- ECET 159- Digital Applications Fall 2010 Purdue Anderson

ECET 209 – Introduction to Microcontrollers Fall 2008 & Spring 2011 Purdue Anderson
Physics I & II (Algebra based) Summer 2012 & 2013 ,Fall 2014 Purdue Anderson (Anderson University)
Physics I (Calc Based) Fall 2012 Purdue Anderson
Led Recitation for electronics class Fall 2013
2014 Trip to Aalborg University Denmark to study alternate power transmission methods.

Experience in Chronological Order

72-77 General Motors Institute Co-op (Presently Kettering Institute in Flint Michigan)
Hands on tooling and design, Power electronics design & test, Ignition system design & test, some controls design.

77-86 Manufacturing Engineering
Primary work was with Material Joining in the area of Ultrasonics. Designed, built, and patented several microprocessor Ultrasonic Weld Controllers. Also helped implement MISAR in Shreveport. MISAR was the first microcomputer engine control in a production vehicle.

86-88 Supervisor of the Material Joining Section
Coordinated process development activities for material joining processes of arc, resistance, and ultrasonic welding. Reviewed project requirements and facilitated appropriate engineering manpower.

88-93 Technology Development Center
Worked on advanced vehicle power generation products such as high power generators and power distribution. Served on a task force for Future Electrical Power Systems. Supervised a development group for the Auxiliary power systems for the GM Electric Vehicle. Assisted with lead-acid and Lithium battery pack controls. Worked on systems for electric hybrid busses.

93-96 Process Engineering
Was a team leader for scrap reduction in our diode bridge department and helped reduce scrap and warranty. Supervised the Material Joining Section and helped develop Laser welded rotor shafts.

96-98 Customer Service Center (Formerly Technology Development)
Developed new Generator (Inverter Fed Lundell) from concept to Production Intent (TDP/ADP)

98-01 Special Assignment to General Motors Warranty Reduction
Lead teams which solved problems with high warranty costs. Shainin strategies were used which led to root cause resolution that had not been solved with other techniques. Products fixed include refrigerant compressors, electrical generators, and ignition systems. Was promoted to Staff Engineer in 99.

01-02 Generator Product Engineering
Product Design Responsible Engineer for new GMT900 generator

02-03 Six Sigma Black Belt Certification
AIT Six Sigma training and Delphi certification with Fuel Pump Warranty project.

03-04 Lithium Polymer Product Engineering
Worked on requirements risk analysis. Helped develop ultrasonic welding of cells through weld measurement and designed experiments. This led to improved tip design and more optimum welder settings.

06-07 Contract to Develop a new Regulator
Designed Hardware and Software for Microprocessor Controlled Regulator for Automotive Generator

07 IUPUI
Associate faculty teaching Electronics Circuit Analysis

08 Contract
Applications Engineer for Solid State Lighting

08-14 Purdue COT at Anderson
Adjunct teaching Micro Controllers, Digital Fundamentals, and Physics

08-14 Consulting
Designed and built low cost delta Vf thermal test unit
Ultrasonic Metal Welding development and optimization
Ultrasonic Metal Welding quality problem diagnosis and resolution
Various Li Battery Pack design and testing, up to 250 kW
uController design
Electronics failure analysis and problem solving

Designed small primary battery pack management system
Review and advise soft hybrid mechanization
Implement J1772 (EV-Hybrid connection) on proof of concept
Generator stability analysis
Designed and built controllers for third world chlorinator (water purifier)

14-16 Applications Eng
Help customers with their applications for motorized motion control
Project lead for Ultrasonic flow measurement

16-18 Lead Systems Engineer
Provided systems engineering for 20kW 48V power electronics integrated machine
Provided advice for other programs

18-present
Lead Engineer
Software for power electronic controls (inverters and dc-dc converters)
Testing of power electronics
Power Electronic Simulation

ADDENDUM

Additional Short Courses

Project Management	Statistical Process Control	Four Phase Product Development
Design for Manufacturability	High Power Electrical Safety	Power Distribution and Controls
Microprocessor Assembly Language	NFPA Code	Taguchi Methods
Overdrive Simulation	Fatigue Analysis	Metallurgy
EMC (ElectroMagnetic Compatibility)	Permanent Magnet Design	Taguchi Design of Experiments
AC Machine Control	AC Machine Design	Shainin Reliability
Shainin Statistical Engineering	Shainin Masters Course	Shainin Green Y
AIT Six Sigma Black Belt	Robust Design	Arc Flash
Smart Power Relays & Control		