

## CURRICULUM VITAE

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### TECHNICAL SPECIALIZATIONS

#### Product Liability

Evaluation of the design and the design processes associated with mechanical devices and production equipment including use, guarding, manufacturability, utility, reliability and safety. Conformance of devices with industrial standards including ANSI, SAE, OSHA and other recognized engineering practices.

The use of material handling equipment in both the industrial and construction environments. Evaluation of the design and use of equipment including forklifts, boom and scissor lift devices and light construction equipment including backhoes and skid steer loaders.

Testing and demonstrations of the above listed devices. The design and production of specialized equipment and test apparatus to confirm collected data or other evidence.

#### Collision Reconstruction

Vehicular accident reconstruction including causation, site analysis and calculation of pre and post-crash dynamics. Determination of vehicle speeds and directions using recognized reconstruction equations and conservation of momentum techniques. Site analysis and documentation using photographic and computer graphic techniques. Specialized vehicle testing to confirm calculations and evidence data.

### EDUCATIONAL AND PROFESSIONAL ASSOCIATIONS

Bachelor of Science in Mechanical Engineering – University of Kentucky, (1966)

Master of Science in Mechanical Engineering (Bio-Engineering) – University of Kentucky, (1968)

Thesis: “Ground Based Simulation of Rocket-Borne Gravity Preference Experiment”

Certified as Trainer for Lift Truck Operators – Clark Material Handling Co.  
“Trainer the Trainer” program, July 1993. Re-Certified as Operator of Sit-Down, Stand-Up and Walkie-Rider style Lift Trucks, August 2008, Portman Equipment Company

Seminars and additional instruction in design, pneumatic tooling and systems, patent and copyright protection, licensing and related matters.

Professional Affiliations include:

Society of Automotive Engineers

American Society of Agricultural and Biological Engineers

Patents:

Issued - Robotic Arm Coupling Device 4,696,524

Issued - Robotic Liquid Sampling System 5,166,889

Issued - Sealing Cap with One Way Valve 5,202,093

EMPLOYMENT HISTORY

1986 – Present      Owner  
Automation Development Corporation  
Lexington, Kentucky

Independent consultant in the field of industrial material handling and automation, performing design and concept analysis, design engineering and market functions. Also provides prototyping of new devices and technical consultation involving design processes and automation. Testing, research services for industrial, agricultural and construction equipment. Hazard risk analysis and development of contemporary design warning labels for heavy equipment. Construction of static and fully operational exhibits for demonstration, seminar and educational purposes.

1987 – 1991            Vice President – Research and Development  
Medical Robotics, Inc.  
Lexington, Kentucky

Designed, prototyped and refined for manufacture, medical equipment and devices related to blood serum processing and containment. Filed patents, both in the United States and foreign countries for recognition of newly developed art in the areas of closed tube sample acquisition. Developed appropriate operational and safety materials for utilization of automated processes.

1979 – 1986            President  
Tri Tek Engineering, Inc.  
Lexington, Kentucky

Owner/Partner of company and responsible for all aspects of technical design, development and company management. Designed, built and installed automated systems for industry. Company also specialized in electronic, electro-mechanical and environmental product development.

1971 – 1979            Vice President – Engineering  
Visumatic Industrial Products  
Lexington, Kentucky

Engineering support for high volume assembly of consumer products such as typewriters, electronic devices and electro-mechanical assemblies. Created an automation group to design and build specific assembly automation for customers nation wide. Responsible for design, construction and marketing of automated units produced by the group.

1970 – 1971            Staff Engineer  
Robinson Tool & Die Co.  
Richmond, Kentucky

Served as staff engineer involved with sales and production of precision tools and metal stampings for the automotive industry.

1964 – 1970            Staff Research Associate  
Wenner-Gren Aeronautical Research Lab  
University of Kentucky  
Lexington, Kentucky

Designed ground based simulation equipment for Aerobee-150 rocket launches carrying live animal payloads, a joint NASA / University of Kentucky project, Wallops Island, Virginia. Technical representative on a team responsible for design, analysis and functional improvement of an orthopedic fracture table.

## RESEARCH, DESIGN AND DEVELOPMENT

Court appointed expert retained by U.S. Magistrate Judge, Cincinnati, Ohio in a matter involving a claim of economic loss from the purchase and use of an automated production system.

Stability determinations of industrial lift trucks in original equipment design in comparison to configurations as modified by ultimate users, and conformance with applicable ANSI B56.1 Safety Standard for Powered Industrial Trucks.

Design and build of a specialized scissors lift work platform mounted to an industrial utility vehicle. Process included hazard analysis, thorough review and adherence to ANSI A92.6, UL wiring and AWS welding standards and creation of appropriate warning labels per ANSI Z535.4.

Crash Data Retrieval Conference – Houston, TX January 29-31, 2007

Damage Analysis and Energy Methods in Traffic Accident Reconstruction, John Daly & Nathan Shigemura, January 17-21, 2005

Special Problems in Traffic Crash Reconstruction – Institute of Police Technology and Management - Jacksonville, FL

April 2004 – Critical Speed Yaw Analysis, Vehicle Vault

April 2005 – Trailer Underride Collisions

April 2006 – Side Impact Collisions

April 2007 – Side Impact Rotational Analysis, Pole Impact Analysis

Crash Data Retrieval - User Certification Course – Institute of Police Technology and Management Jacksonville, FL November 2003

Accident Reconstruction Course – *Vehicle Dynamics* – Northwestern University, Evanston, IL October 8-12, 2001

Accident reconstruction training seminar by Rudolf Limpert, SAE Conference, Detroit, MI, February 24-26, 1997.

Accident Reconstruction software training (PC Crash), MacInnis Engineering Associates, Vancouver, B.C. August 2000 and August 2001

Product Liability Seminar, SAE Conference, Detroit, MI, February 23-24, 1998.

Co-authored paper, 'Lift Truck Safety Enhancement in the Workplace', for Modern Material Handling Magazine, April 1994. Presented paper at the Material Handling Conference, Detroit, MI, April 19, 1994.

Managed the design, development, construction and installation of more than 150 highly automated and fully refined assembly systems into industrial service for clients in the consumer products industry.

Determination of ground level and pedestrian visibility from right-hand drive vehicles including postal delivery vans and refuse collection vehicles. Evaluation of mirror position and types for rearward visibility.

Survey of driver visibility of expected pedestrian populations, from the operator position, for various vehicles found on U.S. highways. Vehicles included full and compact sedans, foreign and domestic sport utility vehicles, full and mini-sized vans, full and compact pick-up trucks, highway tractors both conventional and cab over, and straight trucks including low front entry. Visibility included forward, rearward and an analysis of the mirrors commonly used.

Designed, developed and patented high volume, disposable blood tube closures for use in the clinical laboratory.

Development of warning and informational placards and labeling system for underground, longwall mining and feeding system.

Survey of commercially available audible and visual travel and back-up alarm systems potentially applicable to industrial trucks. This survey related to over 400 audible devices and 350 visual devices produced by 14 manufacturers.

Survey of the use and impact of audible and visual travel alarm systems on pedestrian traffic on airport concourses. The study was designed to determine the recognition of and response to safety alarms on a population that would not ordinarily encounter this type of alarm.

Survey of PTO shaft positions on commercial straight trucks and highway tractor units, including method of attachment relative to the type of setscrews used; square head versus Allen recess. Measurements documented location, shaft length, and height above ground, distance from front of vehicle and distance to nearest access opening.

Development of hardware and measurement methods for visibility assessment of industrial lift trucks in conformance with ANSI B56.11.6 Safety Standard: "Evaluation of

Visibility from Powered Industrial Trucks.” Provide certification, to manufacturers, of visibility compliance for new lift truck products prior to market introduction.

Determination of conformance of lift truck and mast assemblies to ANSI B56.11.6 Safety Standard: “Evaluation of Visibility from Powered Industrial Trucks.”

Survey of industrial lift truck fork retention methods and designs. Survey included assessing the level of redundancy of the majority of lift trucks sold in the United States during the period 1975 to 1993.

Designed, developed, patented and licensed a ‘Quick Change Device’ for robotic end-of-arm tooling.

Study of the sound levels produced when using commercial back-up alarms on lift trucks in warehouse conditions and in semi-trailers. Measurements included the effects of position of the alarm relative to the lift truck, and the interaction of multiple alarms working in close proximity. A ‘smart alarm’ was also included in the testing. This is an alarm that can increase the output level based on the ambient sound conditions.

Conducted coefficient of friction study using multiple shoe configurations on new and in-service, diamond pattern, aluminum tread plate as found on heavy vehicle steps used for ingress and egress. Tests performed in both the dry and water-wetted conditions. A statistical analysis was done to show conformance with accepted, safe, slip resistant parameters.

An analysis of an ultrasonic object detection device mounted, on the rear of a lift truck, and used as a rear travel alert system for the operator. Study included ease of installation, adequacy of instructions, ease of calibration and object detection effectiveness. Analysis also included operational characteristics in real driving and maneuvering situations.

Study of the location and function of the hydraulic control levers in rough terrain lift trucks as they relate to boom lift/lower, tilt and extension. The survey included the inspection of various lift trucks to determine the use of two function control levers versus the four function “joy stick” style.

Launched a series of four sounding rockets to determine animal behavior under conditions of reduced gravity. Responsible for ground-based equipment design and animal training.

Designed and flew gravity preference experiments aboard USAF KC-135 aircraft to demonstrate animal locomotion in near weightless conditions.

Designed and developed two models of automated blood serum processing instruments for the clinical laboratory.