

Curriculum Vitae

Isaac Avitan, Ph.D., P.E.

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SUMMARY:

- ▶ Broad background with 27+ years of MECHANICAL and ELECTRICAL ENGINEERING expertise.
- ▶ Extensive technology and product design and development expertise in a broad range of industries.

EDUCATION:

- ▶ Doctor of Philosophy Degree, Electrical Engineering, *State University of New York @ Binghamton*, Binghamton, NY, 1/93.
- ▶ Master of Science Degree, Electrical Engineering, *State University of New York @ Binghamton*, Binghamton, NY, 1/90.
- ▶ Graduate Studies (Automation & Robotics), Mechanical Engineering, *Georgia Institute of Technology*, Atlanta, GA, 5/85.
- ▶ Graduate Studies (Fracture Mechanics), Mechanical Engineering, *University of Toronto*, Toronto, ONT, 5/81.
- ▶ Bachelor of Applied Science Degree, Mechanical Engineering, *University of Toronto*, Toronto, ONT, 6/79.

REGISTRATION & CERTIFICATION:

- ▶ Registered Professional Engineer, *Association of Professional Engineers of Ontario (APEO)*, 1981-present; and, *Association of Professional Engineers of British Columbia (APEBC)*, 1982-1985; and, *National & Georgia Societies of Professional Engineers (NSPE/GSPE)*, 2007-present.
- ▶ Certified Fire & Explosion Investigator, *National Association of Fire Investigators (NAFI)*, 2001-present.
- ▶ Commercial Pilot (Instrument, Multi-Engine, Sea), *U.S. Federal Aviation Administration (FAA)*, 1994-present.
- ▶ Certified Atomic Radiation Worker, *Atomic Energy of Canada (AEC)*, 1981-1983.

EXPERIENCE:

Avitan & Associates, Inc., Alpharetta, GA

2/98-Present

PRESIDENT; Research, design, development and forensic engineering consultation. Product failure and accident analysis, testing, evaluation, reconstruction, simulation, litigation support and expert opinion. Fire and explosion origin and cause investigation. Damage, injury, or death cause investigation. Patent evaluation, infringement and/or invalidity analysis. Product warnings and instructions, operating manuals and technical documentation evaluation and/or development. Product research, design and development support. Manufacturing process, efficiency, quality assurance/control and manufacturability support.

Southern Polytechnic State University, Marietta, GA

1/99-12/99

ADJUNCT PROFESSOR; Computer Science Department. Graduate engineering curriculum instruction in areas of computer architecture, digital systems design, fundamental hardware building blocks and microprocessor control techniques, concepts and algorithms.

Schaeff, Inc., Sioux City, IA

6/92-2/98

EXECUTIVE VICE PRESIDENT & GENERAL MANAGER; Full P&L and direction responsibility for all business aspects, including; finance, legal, engineering, marketing, sales, after-market, operations and human resources. Highlight achievements; Directed and managed the development of leading edge state-of-the-art proprietary technologies and materials handling product lines, including research, design and development of all mechanical systems, hydraulic systems, electrical systems (hardware and software), ergonomics and packaging. Streamlined engineering development procedures and systems to reduce development cost and time-to-market, and improve product quality and success. Reduced product manufacturing cost in excess of 25%. Increased product quality and reliability in excess of 4x. Reduced product liability in excess of 100x. Reduced inventory by 2/3 though component commonality. Reduced manufacturing lead-time from 16 weeks down to less than 4 weeks. Increased sales from less than \$1M to more than \$18M. Succeeded in attaining multi-year/million dollar private label supply agreements with Hyster Company and Yale Materials Handling Corp (both, div. of NMHG, Inc.).

The Raymond Corporation, Atlanta, GA; Hollister, CA; Greene, NY

6/83-6/92

MANAGER, ADVANCED DEVELOPMENT & APPLIED RESEARCH; (11/88-6/92 Greene, NY) – Directed applied research and technology development. Products developed: motor controls technology, wire guidance, vision systems, Orderpicker, Reach/Straddle and Swing-Reach product lines (inclusive of Raymond-Caterpillar Orderpicker and Reach/Straddle product lines).

MANAGER, ELECTRONICS DEVELOPMENT; (8/86-11/88 Greene, NY) - Created the goals and objectives to justify creation of R&D department. Directed research, design and development of controls and control systems development (hardware & software) for

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electric forklifts, utilizing advanced filters, adaptive, decoupled and open/closed-loop controls, surface mounting, hybrids, dc motors, power electronics, application specific integrated circuitry, vision systems, guidance systems, radio frequency control and protocol development. Architected corporate wide controls and new product development strategy.

SENIOR PROJECT ENGINEER; (8/85-8/86 Hollister, CA) – Developed progressive and flexible assembly automation systems, including functional specifications and contractual requirements. Supervised construction, field installation, debug and acceptance. Trained company personnel in project management.

PROJECT ENGINEER; (6/84-8/85 Atlanta, GA) - Developed automation systems and controls for industrial carousel applications. Designed cold storage, pallet handling and automated load/unload carousel machinery. Redesigned carousel mechanical systems. Designed microprocessor based adaptive servo-positioning controls for carousel product. Design included functional specifications, circuitry development, drawing schematics, PCB layout, packaging (including sheet metal fabrications, aluminum extrusions and plastics injection moldings), cabling, prototyping, testing, debugging, development of software and documentation. Control system was instrumental in winning a \$6.6M carousel order from Ford Motor Company.

SYSTEMS ENGINEER; (6/83-6/84 Atlanta, GA) - Developed automation projects (work-in-process for Canadian General Electric and parts distribution/kiting Automation for Marconi Avionics), including development of functional specifications, design, construction, installation, integration, programming, debugging, training and commissioning of systems. Designs included Programmable Logic Controllers, Mini/Micro-Computers, Laser Barcode Printers/Readers, Carousels, Robots, Transporters, Conveyors, Controls (hardware & software utilizing Fortran, Basic, Ladder Logic and Assembly language).

PAK-IT Manufacturing Company, Norcross, GA

11/82-6/83

ENGINEERING MANAGER; (2/83-6/83) - Managed engineering department. Developed departmental operating procedures, budgets and direction for technology and new product development. Introduced electronic controls to product lines, including the utilization of Programmable Logic Controllers.

CONSULTANT ENGINEER; (11/82-2/83) - Machine design of high speed dough handling and processing equipment (conveyors, mixers, needers, dividers and pumps) as well as electrical design of systems controls. Developed systems functional specifications and technical manuals. Designs included digital and analog circuits, ac inverters, dc converters, closed-loop servo controllers, instrumentation and feedback controls.

Ontario Hydro Corporation, Nuclear Generation Division, Central Nuclear Services, Toronto, ONT

8/81-9/82

ASSISTANT TECHNICAL SUPERVISOR; Technical leader in the development and implementation of computer based non-destructive inspection robotics for nuclear reactor. Developed operating, commissioning, maintenance and inspection procedures. Trained technicians on the techniques of non-destructive inspection of nuclear reactor fuel channel and associated equipment. Provided technical expertise in the area of non-destructive inspection (Gauging, Eddy Current and Ultrasonic).

Sentrol Systems Limited, Forest Products Division, Downsview, ONT

5/79-8/81

MECHANICAL DESIGN, GROUP LEADER; (6/80-8/81) – Developed process control machinery and sensors for paper making machines. Designed drives, heating, cooling, and vacuum systems for counterfeit prevention machinery (substrate deposition onto mylar under high-vacuum, utilizing electron-beam-gun). Inventor: microprocessor controlled, electronically scanned, non-contacting, reel hardness sensor. Developed many engineering procedures, standards and specifications.

MECHANICAL DESIGN ENGINEER; (5/79-6/80) – Designed process control machinery. Designs included utilization of computers for finite element analysis of structures in the areas of stress, vibration and heat transfer. Developed vibration and environmental test equipment for in-house use and refrigeration systems for process control computer systems. Developed paper making machine paper moisture sensor means utilizing infrared and microwave technology, and paper thickness gauge sensor means. Performed cost redesigns and improved manufacturability of products.

Ontario Hydro Corporation, Fossil Fuel Division, Lakeview Generating Station, Port Credit, ONT

5/78-9/78

ENGINEERING TRAINEE; Wrote numerous overhaul procedures for power-generation equipment. Designed, built and tested heat-exchanging equipment to thermally isolate generator governor from high-pressure turbine. Performed vibration analysis on power generation equipment. Assisted department manager in project management.

Vernomatic Limited, Division of Magna International, Downsview, ONT

5/76-9/76, 5/77-9/77

TOOL & DIE MAKER; Designed and built single-stage, multi-stage, progressive, compound, blanking, forming, deep draw and reverse draw production tools and dies for high volume automotive production stamping operation. Designs included under-carriage, body and

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trim parts ranging from light to heavy gauge materials, including cold and hot rolled steel, aluminum, and stainless steel. Responsibilities included machining, heat-treating, grinding, turning, welding, finishing, etc.

Venco Metals Manufacturing Company, Etobicoke, ONT

1/74-5/76

APPRENTICE TOOL & DIE MAKER: Apprenticed under master tool maker through all aspects of tool and die making. Designed and built tools, dies, jigs and fixtures for stamping operations of automotive undercarriage parts, including tools and dies for single-stage, multi-stage, progressive, compound, blanking, forming, deep draw and reverse draw operations, to mention few.

INDUSTRY STANDARDS PARTICIPATION & ADVISING:

- Member, *ASME B56.1 Subcommittee on Safety Standard for Low Lift and High Lift Trucks*, 1997-Present.
- Evaluator, *Accreditation Board for Engineering and Technology (ABET)*, 1991-Present.
- Advisor, *Georgia Department of Labor - Project Safe Georgia (PSG)*, 2002-Present.
- Member, *ASAE S318.13 Working Group for Safety for Agricultural Field Equipment*, 2000-2007.
- Advisor, *Iowa State University Center for Industrial Research and Service (CIRAS)*, 1994-1998.

PROFESSIONAL AFFILIATIONS:

- Senior Member, *Institute of Electrical and Electronics Engineers (IEEE)*, 1986-Present.
- Member, *American Society of Mechanical Engineers (ASME)*, 1976-1982. 1989-Present.
- Member, *American Society for Testing and Materials (ASTM)*, 1999-Present.
- Member, *American Society for Metals International (ASM)*, 2005-Present.
- Member, *National Fire Protection Association (NFPA)*, 1998-Present.
- Member, *National Association of Fire Investigators (NAFI)*, 2001-Present.
- Member, *American Society of Safety Engineers (ASSE)*, 2005-Present.
- Member, *American Society of Agricultural Engineers (ASAE)*, 2000-2007.
- Member, *Society of Automotive Engineers International (SAE)*, 1976-1982, 1999-2007.
- Member, *American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE)*, 1976-1982.
- Member, *Material Handling Institute (Integrated Systems & Controls Product Group) (MHI)*, 1986-1992.
- Member, *Material Handling Industry Association (MHIA)*, 1992-1998.
- Member, *Industrial Truck Association (ITA)*, 1996-1998.

OTHER TRAINING:

- Aerial Lift Operator Training & Certification, *United Rentals Aerial Equipment, Forest Park, GA*. 12/03.
- Computer Fire Modeling, *National Association of Fire Investigators (NAFI), Sarasota, FL*. 8/02.
- Fire, Arson and Explosion Investigation, *National Association of Fire Investigators (NAFI), Sarasota, FL*. 7/01.
- OSHA Powered Industrial Truck Operator Training, *Materials Handling Engineering, Cleveland, OH*. 9/98.
- JIT, TQM, SPC, KANBAN, MRP-II & ISO-9001, *Raymond Corp.* 8/88; *Schaeff Inc.* 2/96, 2/97.
- Fuzzy Logic Control, *Duke University, NC*. 12/91, 7/93.
- Application & Control of Electric Motors, *The George Washington University, Washington, DC*. 12/88.
- Criteria for New Product Success, *University of Wisconsin, Madison, WI*. 6/87.
- MC68HC11 Applications, *Motorola Inc. - Semiconductor Products, Boston, MA*. 3/87.
- Project Management, *American Management Association, NY*. 12/87-6/88, 4/90.
- Management & Technical Leadership, *State University of New York, Binghamton, NY*. 9/86-12/87.
- Non-Destructive Testing, *Ontario Hydro Corp. Toronto, ONT*. 3/82.
- Nuclear Engineering, *Atomic Energy of Canada; Ontario Hydro Corp. Rolphton, ONT*. 8/81-2/82.
- Applied Pneumatics, *Martonair Ltd., Toronto, ONT*. 10/79.
- Tool & Die Making, *Venco Metals Manufacturing Company, Etobicoke, ONT*. 1/74-5/76.

PATENTS:

- Avitan, *Load Sensing System*. #6,170,341, 1/9/01.
- Avitan, *Stabilization System For Load Handling Equipment*. #6,050,770, 4/18/00.
- Avitan et al., *Lift Truck Mast Hose Reeving System With Chain Guideway*. #5,890,563, 4/6/99.

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- Avitan et al., *Motor Drive*. Des #382,573, 8/19/97.
- Avitan et al., *Dual Axis Carriage Assembly for Control Handle*. #5,655,411, 8/12/97.
- Avitan, *Fork Lift Truck*. Des #379,020, 4/29/97.
- Avitan, *Speed Regulation of DC Motor Using Current Sensing Means*. #5,585,706, 12/17/96.
- Avitan et al., *Drive Train Assembly*. #5,558,174, 9/24/96.
- Avitan, *Material Handling Vehicle Height Measurement System*. #5,526,673, 6/18/96.
- Avitan, *Coupled Differential Turning Control System For Electric Vehicle Traction Motors*. #5,487,437, 1/30/96.
- Avitan et al., *Method Of Handling Stacks Of Baked Goods Trays*. #5,478,196, 12/26/95.
- Avitan, *Regulation System For Coupled Efficiency Optimized Operation Of DC Traction Motors*. #5,453,672, 9/26/95.
- Avitan et al., *Control Handle For A Material Handling Vehicle*. Des #362,330, 9/12/95.
- Avitan, *Material Handling Vehicle Operator Display*. Des #353,118, 12/6/94.
- Avitan, *Speed-Dependent Traction Motor Controller For Vehicles*. #5,349,279, 9/20/94.
- Avitan, *Material Handling Vehicle Height Measurement System*. #5,341,695, 8/30/94.
- Avitan, *Front Face Of An Operator Display Panel For A Material Handling Vehicle*. Des #349,677, 8/16/94.
- Huntley, Avitan et al., *Integrated Controls and Seating Configuration for Reach-Fork Vehicles*. #5,275,255, 1/4/94.
- Avitan, *Motor Vehicle Steering System having Reversible Direction Control*. #5,265,021, 11/23/93.
- Avitan, *Optimizing System for Vehicle Traction Motors*. #5,264,763, 11/23/93.
- Avitan, *Material Handling Vehicle Operator Display*. Des #337,962, 8/3/93.
- Avitan et al., *Control Handle for a Material Handling Vehicle*. Des #336,713, 6/22/93.
- McCormick, Avitan et al., *Control Handle for a Material Handling Vehicle*. Des #335,741, 5/18/93.
- Avitan, *Variable Ratio Steering System for a Motor Vehicle*. #5,181,173, 1/1/93.
- Avitan, *Material Handling Vehicle Display Panel*. Des #327,858, 7/14/92.
- Avitan, *Material Handling Vehicle Steering System*. #5,128,598, 7/7/92.
- Bachman, Avitan et al., *Temperature Control System for Motors & Power Components of a Material Handling Vehicles*. #5,123,081, 6/16/92.
- Kellogg, Avitan et al., *Material Handling Vehicle Identification Tag*. #5,113,344, 5/12/92.
- Avitan, *Traction Motor Controller for Forklift Vehicles*. #5,070,283, 12/3/91.
- Avitan, *Traction Motor Optimizing System for Forklift Vehicles*. #5,039,924, 8/13/91.
- Avitan et al., *Lift Truck Control Systems*. #4,942,529, 7/17/90.
- 50+ international patents.

PAPERS, PUBLICATIONS, & PRESENTATIONS:

- Popilock, Timoney, & Avitan, *Forklift Accidents Involving Forklifts, Scissor Lifts, Aerial Boom Trucks, Cranes and Other Equipment that move People and Property*, National Association of Subrogation Professionals Conference, Atlanta, GA, 11/04.
- Avitan, *Forklift - Productivity Tools in the Proper Hands*, Georgia Safety, Health & Environmental Conference (sponsored by Georgia Department of Labor), Savannah, GA, 10/02.
- Avitan, *Active Stability Control System*. Analysis and proposal report under contract to NMHG, Inc., 3/00.
- Avitan, *Controllability & Ergonomic Aspects of Electric Stand-Up Forklift Operator Controls*. Position paper written by request for ITA task team on standardization of Electric Stand-Up Forklift Operation, 11/97.
- Avitan, *Schaeff Incorporated Pursuit of BUSINESS EXCELLENCE*, Materials Handling Engineering Magazine, Modern Materials Handling Magazine, Managing Automation Magazine and Manufacturing Systems Magazine, 10/97.
- Avitan, Skormin, *Decoupling Control of a Separately Excited DC Motor with Independent Armature/Field Control*. IEEE Transactions on Industrial Electronics, 9/94.
- Skormin, Avitan, Yu, Blaignan, *Optimal Control of Regenerative Braking of a DC Motor*. Incremental Motion Control Systems Society, 22nd Annual Symposium, 6/93.
- Avitan, *A New Generation of Controls for Battery-Powered Industrial Lift Trucks*. Ph.D. Dissertation, State University of New York, 1/93.
- Avitan, Skormin, *Mathematical Modeling, Computer Simulation and Methods of Decoupling Control of a Separately Excited DC Motor with Independent Armature/Field Control*. Incremental Motion Control Systems Society, 21st Annual Symposium, 6/92.
- Avitan, Skormin, *A New Generation of Controls for Electric-Powered Materials Handling Vehicles*. International Journal of Systems Automation: Research & Applications, 10/91.

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- ▶ Avitan, Skormin, *Mathematical Modeling, Computer Simulation and Methods of Decoupling Control of a Separately Excited DC Motor with Independent Armature/Field Control*. IEEE Transactions on Industrial Electronics, 7/91.
- ▶ Avitan, Skormin, *Mathematical Modeling and Computer Simulation of a Separately Excited DC Motor with Independent Armature/Field Control*. IEEE Transactions on Industrial Electronics, vol. 37, no. 6, 12/90.
- ▶ Avitan, *Mathematical Description, Analysis and Development of Microprocessor Based Control of Separately Excited DC Motor for Battery Powered Lift Trucks*. M.S. Thesis, State University of New York, 12/90.
- ▶ Avitan, Armading, Lyons, *Specialized Controllers: Design and Implementation*. IEEE First Annual Symposium on Automatic Controls: Theory and Applications, Binghamton, 12/88.
- ▶ Skormin, Liu, Avitan, *Adaptive Vision Based Guidance Technique for Automatic Vehicles*. IEEE 14th Annual Industrial Electronics Conference, Singapore, 10/88.
- ▶ Avitan, *Design Guideline: Fatigue Design Using Fracture Mechanics*. Sentrol Systems Ltd., 1/81.
- ▶ Avitan, *Design Guideline: Structural Design Using Fracture Mechanics*. Sentrol Systems Ltd., 6/80.
- ▶ Avitan, *Analysis of Acoustical Perimeter Radiant Heating*. B.A.Sc. Thesis, University of Toronto, 6/79.

SPONSORED WORK:

- ▶ Yu, *Optimization of Regenerative Braking in Industrial DC Motors*. M.S. Thesis, State University of New York, 5/92.
- ▶ Liu, *A Study of a Knowledge Based Adaptive Control Scheme*. Ph.D. Dissertation, State University of New York, 12/89.
- ▶ Phan, *Optimization Mathematical Description, Analysis and Design of Microprocessor Based Control of a Carousel Type Mechanism*. M.S. Thesis, State University of New York, 2/8, 2/89.