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Resume/VITAE



<http://www.angelusresearch.com/military>

Objective: Looking for a project manager position in the robotics field requiring product development programs to meet or exceed the original design goals. The final product must be very cost effective to manufacture plus easy to maintain and service. A strong leader and team player, highly motivated by the prospect of conquering difficult challenges placed before him and his project team.

Summary: Extensive experience in management and the robotics technology field. Founded and managed several companies with unique cutting edge products and services. Always focused on "The Big Picture"; enjoys pioneering and trail blazing new technologies, products and services. Enjoys conquering great challenges by using the process of analyzing potential solutions, calculating risk reward ratios of potential design paths, and developing/analyzing various solution spaces in order to implement the logically derived strategies. Arrives at decisions through logical analysis and comprehensive customer interviewing in order to determine the key features the final design must incorporate. Believes all companies should focus on being "Market Driven" to insure quick response times to fast moving market shifts and competitive product introductions. Always evaluates possible design choices with an eye towards reliability, serviceability, and manufacturability.

Believes in promoting teamwork among all company employees all of the time. Always keeps team members tightly focused on the final project design goals.

A life long learner who enjoys acquiring new skill sets though taking engineering, marketing, and business development courses continually.

Has a broad technical background which encompasses many areas of product design: special purpose computer systems, embedded systems, analog, digital, and microprocessor circuit design plus extensive software development as well. Has a wide repertoire of engineering and software skill sets which have been honed by over thirty years of developing various high technology products; especially robotic systems.

Technical competencies: With a strong programming background, developed the Triune Operating System in 1991; the first commercial software to mimic the three levels of intelligence associated with the human brain/nervous system. Has a strong knowledge in analog, digital, and microprocessor circuit design for robotics and embedded systems.

Developed a reliable sonar sensor system in 1992 where none previously existed. This product was specifically designed to be used for intelligent robots to reliably detect doorways/objects for real-time path planning and collision avoidance applications. Other researchers and companies in the robotics community relied on Polaroid sensors which were not designed specifically for robot applications. These sensors were designed for long range wide angle photographic camera applications resulting in too much acoustical power and beam spread for robotic applications. As a project manager, who is always focused on the big picture, believes identifying and solving the real problem, not just writing software to work around it. This generally requires a strong understanding in all three areas of robotics: software, electronics and mechanical design methodologies.

Proficient use of business software tools to create: design specifications, supporting sales literature, presentations, distributor manuals, websites, price lists, customer databases, and sales forecasts. Proficient use of: Word, PowerPoint, FrontPage, Excel, etc. Has an extensive business background and understands

marketing concepts, accounting principles, managerial/leadership techniques, and finally, always promotes the simple idea that every company must make a profit and be as competitive as possible. Has good business software programming skills, developed many business programs for both personal/professional use. Developed several information management databases for various clients concerned about increasing business information management and tracking.

Licensed to work on high power RF systems for use in military and law enforcement applications; Bands covered: ISM (2.4 ghz, 1.2 ghz and 900 mhz), VHF (144-148 mhz) and UHF (420-450 mhz) with a Technicians Amateur Radio Class License from the FCC.

Product development:

FPGA/VHDL/Verilog Development (2004)-Developing a Triune Single Chip Processor using both VHDL and Verilog languages for FPGA or ASIC devices. Field Programmable Gate Arrays (FPGA) are pin rich devices, inherently parallel in nature, providing very fast operation and consuming very little power (CMOS versions). They have the ability to process hundreds of parallel tasks concurrently. The project is about sixty percent completed; finalizing this project could be done under the iRobot umbrella funded by one of the company's current or future research programs in about a six month timeframe. Most robot control operating systems such as Rodney Brook's Subsumption Architecture, ARC's TOS, or JPL's 3T, are simulations of parallel operations implemented on fast sequential (von Neumann) microprocessors. Performance of FPGA's and ASIC's are an order of magnitude higher than even the fastest DSP microprocessors due to their parallel nature when applied to parallel problems like robotics. The cost of these devices are following Moore's Law by increasing performance substantially every year while simultaneously lowering prices.

Ranger Modular Robot (2004)-The Ranger Modular Robot was designed to allow soldiers in the field to re-assemble and disassemble the robot within minutes. The tract sections can be removed from the main body section within two minutes for fast assembly, disassembly, or reconfiguration. The robot can be transported to the mission site in sections by multiple soldiers, without a single soldier giving up all of his essential backpack space to carry only the robot. The power is provided by Lithium Polymer rechargeable batteries giving it 6 to 8 hours of operating time. The system also includes a high power VHF control link and a UHF video link for long range operation of a mile or more. All or part of this design may be incorporated in iRobot's projects.



Intruder (1997)-This was a novel "All Surface Drive" Robot developed for military operations. The design successfully incorporated a zero ground clearance concept with good performance on compliant surfaces such as: snow, mud, and sand. The system can be disassembled in a matter of minutes for service or battery replacement. A long range wireless system gave it a tested line of site control range of 4500 feet with omni directional antennas.



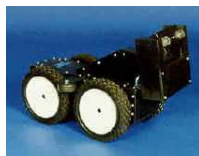
Developed the first man-pack robot for US Special Operations Forces Robotics Program (SOFROB Project)-The principle researcher, Col. John Blich, needed a demonstration robot to explore uses of small 40 pound unmanned machines for military applications. The ATIR 6000, nicknamed "Goldie", was the primary robot used for wireless demonstration purposes early in the program. The robot demonstrated the use of small robots for Bomb Damage Assessment (BDA), reconnaissance and other hazardous duties encountered in military operations. The system used the ARC Triune Controller, forward looking proprietary sonar, IR optical sensors and wheel load monitoring. The system included totally wireless communications for remote operation.



Advanced Whiskers (1993)-This robot is the advanced version of Whiskers the Intelligent Robot. It adds a head subsystem with ARC's proprietary sonar ranging system and four additional optical sensor arrays for improved obstacle detection. It uses two onboard computers networked together so students and researchers can experiment with this intelligent robot which navigates in unknown environments, autonomously. This was the first robot to incorporate two Triune Processors: one for collision avoidance and the other for navigation purposes. Over 50 of these systems were sold to date.



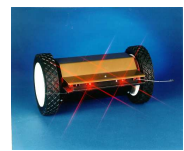
Pipebot (1993)-This robot was designed for a customer whose requirements included inspecting a twelve inch pipe from the inside. It used two Triune Controllers networked together; one controls the base and the other the pan and tilt head. The system inspected pipes by panning the head from right to left while simultaneously pivoting the video camera forwards and backwards, all under operator control as the robot moved forward.



Stockboy AGV (1994)-The robot was designed to deliver boxes within factories, businesses and hospitals completely autonomously. It will stop when it detects an obstacle then deliver the package when the path is clear. The robot will wait at the conveyor belt until it detects a new package, turn on the belt to move the package onto the robot, and finally deliver it to the end of the line where it detects a strategically placed beacon. When the operation is completed, the robot will drive back to the home position at the end of a conveyor belt and wait for another package to arrive triggering a repeat of the process automatically.



Whiskers (1990)-Originally developed for the research community, this intelligent mobile robot can be programmed using the English language for ease of use. The robot has been proven to be a highly motivational and educational device for kids from Elementary through High Schools. These robots were very popular in Technical Education Labs sold during the 1990's. Using a ten day curriculum, students explore computer science, artificial intelligence, and robotics without any previous experience in these fields. The robot was primarily sold through educational distributors: Labvolt and Paxton-Patterson.



Motorola 68HC11 Intelligent Robot Controller (1990)-15 years of experience designing intelligent control systems using the Motorola 68HC11 microprocessor for robotic products. Invented the a two level architecture (Goal Level and Instinct Level) and a three level architecture (Goal, Behavior and Instinct Levels) for intelligent machines based on our own human control system (Artificial Intelligence: AI). Attained a software copyright from the US Patent office (1995) on both intelligent software implementations for controlling intelligent robots in real-time. This work was inspired by the Subsumption Architecture research performed by Dr. Rodney Brooks of MIT.



Mobile Robot Power Systems-developed a novel circuit to allow the very popular 5590 Sulfur Dioxide military batteries to be used successfully in parallel as a primary power supply for mobile robots requiring currents of 20 amperes or more. This is the military's most popular battery, six batteries can supply approximately 1.5 kilowatts of power for a robot the size of iRobot's Packbot. The key limitation of these powerful batteries is they are internally fused to limit the supplied load current to only two amperes. Developed a new power system which uses Lithium Polymer rechargeable batteries, they have one of the highest power density factors in the rechargeable battery technology field today.

6502 based Computer (1983)-The first online computer system to help medical technicians organize, document, and perform immediate calculations on soft tissue ultrasonic images such as: organ area, estimated weight, and the system calculated delivery dates for unborn fetuses.

A real-time scan converter (1983)-Interfaces video monitors and systems to equipment designed to use electrostatic displays (XYZ Oscilloscope types). The system used PAL technology to create complex system timing signals at a 24 MHz clock rate. High speed board layout problems were addressed and solved.

Career History

2001-2004 National Sales Manager-Leoch Battery Corp.-Introduced Leoch, a Chinese Battery Manufacturer, to the US marketplace and increased sales from \$250,000 per year, to over \$20,000,000 per year in just a three years. Using strong business experience and skills, developed a successful marketing strategy for Leoch, differentiating both the company and its products from much larger, more established competitors; Yuasa and Panasonic, gaining both market share and prominence, as a result.

1991-2001 Angelus Research Corp.-CEO, marketing director, and the primary product engineer for the company. Engineering functions included developing real-time intelligent robotic systems requiring a broad technology background in digital, analog, and video circuits, vision system integration, mechanical design, radio communications, and circuit board design. Additional duties included: software design and embedded system programming. Founded in 1991, the company developed integrated sensor and control technology for truly intelligent machines. Several custom robots were constructed and sold by the company to customers such as: US Special Forces, the CIA, and the technology education market. The company sold over 1,000 robots to date.

1984-1991 Imager Service Specialists-Founded this medical services company specializing in video imaging equipment used with CT scanners, ultrasound, and nuclear medicine scanners found in the hospital radiology departments.

1979-1984 Space-Tek, Inc.-Founder and president; the company developed proprietary medical imaging products for industry leaders such as: Squib Medical Systems, General Electric, Toshiba Medical, and Siemens Medical under private label business relationships. Developed state-of-the-art hardware products for the medical imaging field including a Video Analog Processor and a Real-Time Scan Converter to convert electrostatic display signals to video in real-time. Invented a proprietary online computer used in conjunction with hospital diagnostic ultrasound scanners to improve the accuracy of the documentation and patient throughput.

1976-1979 Schiff Medical Products-Managed the Tech/Engineering Lab with six engineering technicians, duties included product development, production testing procedures development, final product calibration and testing. Other responsibilities: OEM Field Service Engineer training and support for major customers: Squib Medical Systems, General Electric, Toshiba Medical, and Siemens Medical.

Speaking engagements-The NASA Roundtable on Robotic Technology and the Roundtable on Robotics for Home Healthcare sponsored by JPL.

Professional Organizations-Current member of the IEEE and past Technical Vice President for the Robotics Society of Southern California.

Education-Electrical Engineering-Cal Poly, San Luis Obispo. The Advanced Digital Systems Engineering Certificate Program at the University of California, Irvine is currently being completed. UCI Continuing education postgraduate engineering extension courses include: Systems on a Chip (SOC) development using VHDL and FPGA technology. Computer Science courses include: Pascal, Data Structures and Artificial Neuro-networks.