

Helmut Forren

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PROFESSIONAL PHILOSOPHY

As an engineering professional, I value my superlative capability with across-the-board coverage. Clients and employers alike bring me their product goals and I convert them from imagination to reality. My expertise encompasses the complete life cycle and business of hardware and software systems, from architecture design through implementation, debugging, production, deployment, in-house and user documentation and presentation, marketing, sales and support. I also provide both short- and long-term growth of in-house core technologies and tools to ensure future scalability. Whether dealing with complex systems, database interaction, graphical user interfaces (GUI), OOPS classes and controls, accounting and other business software, or Internet with e-commerce systems, I always step up to the challenge.

EXTENSIVE PROFESSIONAL EXPERIENCE

Ongoing experience in the following areas:

Over 15 years experience...

- Software development and deployment
- Intranet (Network), Internet, and E-Commerce
- Hardware & Firmware development and production
- Embedded systems development and production
- Business & Management

CORE TECHNICAL EXPERTISE

Languages: C#/ .NET, C++/C, VB/Basic.

Also: WCF, Java/J2EE, Java Applets, JavaScript, PERL, ASP, HTML, PHP, general OOP (Object Oriented Programming), FORTRAN

Databases: MS Access, SQL Server, MySQL.

Also: custom & generic relational databases

Operating Systems: Windows Vista/XP/2000/ME/NT/98/95.

Also: Windows 3.11/2.0/1.0, DOS, UNIX, Linux, VMS, NOS, EDX, Mac

Networks: Internet protocols (IP, TCP, UDP), Windows for Workgroups. Also: NOVELL

Technical Tools: Microsoft Visual Studio, InstallShield, Perforce P4V, SCS (Source Control), Microchip MPLAB, Eagle PCB Design.

Microprocessors: Microchip RISC (PIC 8- and 16-bit processors), Analog Devices SHARC DSP. Also: Motorola 68*, Intel 80*86

Business & Support Tools: Microsoft Office Suite (Word, Excel, PowerPoint, Project, Outlook, Access, Publisher, Groove) Adobe Creative Suite (Photoshop, Illustrator, Acrobat), Quark XPress, QuickBooks. Also: Norton, Symantec, and McAfee products.

CORE BUSINESS EXPERTISE

Management: Owner/operator of multiple small corporations, Manager and leader of teams ranging from two to seven persons

Communication: Toastmasters speaker, Candidate for statewide political office, Science Tutor for high school students

Personal Interaction: Volunteer coordinator, Assistant Director metro-Atlanta cultural organization, Chairman state-wide political organization

PROFESSIONAL APPOINTMENTS

1992-Present – Owner & Engineering Consultant at Forefront Inc.

Clients include: Microsoft Corporation, LT Sound, Arthur Andersen, Computech Systems, CarNetix, LapZapper, ID Network, Voice Computer Technologies, DAVOX, 20/20, Covenant, Insurance Software Solutions, and SCS

Prior – Sole Proprietor and Engineering Consultant

Clients include: Lockheed Georgia, BSC, SCS, Delta Tech, Technology Dynamics, and Insurance Software Solutions

ADVANCED EDUCATION

Doctor of Philosophy in Electrical Engineering

Georgia Institute of Technology 3.8/4.0 GPA – Highest Honors

Thesis: “Multiprocessor Design Methodology for Real-Time DSP Systems Represented by Shift-Invariant Flow Graphs”, relating to organizing, load balancing, optimizing, and scheduling of tasks with complex interdependences; applicable to both programming and management responsibilities. Minor: mathematics.

Master of Science in Electrical Engineering

Georgia Institute of Technology 3.8/4.0 GPA – High Honors

Specializing in Computer Systems and Applications, Quantum and Physical Electronics, and Digital Signal Processing. Minor: mathematics.

Bachelor of Electrical Engineering

Georgia Institute of Technology 3.8/4.0 GPA – Highest Honors

Emphasis on Microcomputer & Microprocessor Hardware, Computer Science & Programming, and VLSI Integrated Circuit design

NOTABLES

Patent #5781869 – Vehicle Reaction Timer

Patent-pending – 900 MHz RF Race-Car Timing & Scoring System

Semi-Professional Race Car Builder/Driver

Custom Home Owner/Builder/Designer

PRO BONO PROJECTS

Science Tutor, STAN High School Graduation Preparation Program

Assistant Director, Peachtree International Film Society & Festival

Insurance Software Solutions landed a new contract with the Kentucky Association of Self-Employed Miners. I had to convert tens of millions of dollars in claims data to the ISS financial system, one I had helped develop for the prior software owner, BSC. My conversion program took several days of processing. Upon completion, an audit feature I had built in found a three cent error. I knew this was due to more than just three cents. After a week of analysis, I discovered the original data had tens of thousands of dollars of internal inconsistencies that just happened to add up to almost exactly zero. I devised a correction, re-ran the conversion, and the audit came out spotless. This was a big contract, and a perfect job worth every penny to the company owner. For me, it was a testament to my innate understanding of complex system, to recognize that this was not simply a three cent error that could be ignored. This was also a show of my technical strength and data mining ability, to accurately fish out the errors from a vast sea of numbers. Oh yes, and the client loved it!

Software development experience:

DataMaxx race car data analysis software	15+ Years
<p>Problem: The data recorder on a race car is only as good as its PC analysis software. The challenge for nearly 20 years has been, after designing and building the original software, keeping it fresh, fast, and backward compatible.</p> <p>Solution: The analysis software has been continually upgraded, using ever-improving GUI and development tools (C++, pre-MFC, MFC, Visual Studio). Initially, the PC serial COM port was used for communicating with the hardware, and then USB was added. Meanwhile, each new hardware version brought dramatic changes to the raw recorded data. The software has been upgraded to parse each new data format, storing an ever-improving common super-format in memory, facilitating fast redraw and panning on the screen. Through all of this, the original over-arching GUI design has proven easy-to-use for even the most computer illiterate motor-head. Recordings from five drastically different generations of hardware can be seamlessly overlaid and compared, allowing racers to compare today's performance to previous year's, recorded on older systems.</p>	<p>Keywords: C++, OOP, GUI, MFC, Visual Studio, COM, USB</p> <p>Responsibilities: All phases of development. Rapid Application Development, including Agile and Extreme Philosophies; system architecture, hardware drivers, graphical user interface (GUI) design, coding, testing, and second-tier technical customer support.</p>
Microsoft Windows systems and applications	15+ Years
<p>For Microsoft Information Highway PC Group: provided overall architecture and design of DLL's, VxD's, and NDIS device drivers for new Windows 95 system product.</p> <p>For Microsoft Windows Printing Group: implemented and tested PCL emulator DLL used with the Windows Printing System product.</p> <p>For Arthur Andersen: Developed automated Internet file-transfer utility using FTP.</p> <p>For Forefront & LapZapper: Designed and implemented real-time centralized official timing and scoring software with visually advanced display features.</p> <p>For Technology Dynamics: Graphical systems control interface for Houston County Waterworks</p> <p>For BSC & ISS: Developed insurance risk management system using (MFC) and Microsoft Access; built fourth generation applications development system with parameterized data entry, plus automated report and menu generation, using both Windows DLL's and DOS TSR's.</p>	
Databases, databases, and more databases	15+ Years
<p>For Voter Choice Coalition: Developed unique compilation and reduction of 4.5 million record master State of Georgia database, into 65,000 MySQL indexing database for associating individuals with voting districts for U.S. Congress, Georgia Legislature, County Commissions, and School Districts.</p> <p>For 20/20: Upgraded the library access software for their kitchen cabinet design system, a family of products still in use today at Home Depot and Lowes home improvement stores.</p> <p>For BSC: Participated in development of custom indexed-sequential access database manager (Knuth's btree method, DOS TSR & Windows DLL); converted to assembly language for 10x speed improvement; developed multiple automated utilities for converting databases from mainframes to IBM PC.</p> <p>For multiple clients: Developed dozens of special-purpose databases, using Access, SQL Server, MySQL, Excel, and other databases.</p>	
Designed and implemented on mini- and micro- and handheld computers	15+ Years
<p>Commercial image-handling software for Pocket PC using embedded C++</p> <p>Commercial applications for the IBM PC and IBM Series/1, including insurance risk management, general ledger, payroll, accounts receivable, accounts payable, inventory, contribution processing, client time accounting, commissions receivable, and touch-screen building directory</p> <p>Voice response telephone registration systems with real-time on-line host interaction</p> <p>Energy management system featuring touch-tone and power line carrier communications</p> <p>Hand-held laser-scan inventory collection and management system.</p>	

Hardware, Firmware & Embedded Development and Production Highlights:

DataMaxx race car data acquisition system

2 Years (15+ Years total experience)

Problem: Long-time client Computech Systems needed a new market-competitive data acquisition system that presented a low entry cost to attract new customers, while simultaneously providing a level of performance exceeding that of Computech's and competing products currently on the market.

Solution: Conceive, develop, and deliver a multiple module solution. Each module handles a small number of sensors, and communicates over a bus with the others. Streaming data is stored on a removable camera-type SD Card. A fully custom 10" x 4.5" LCD dash-replacement display adds much-needed pizzazz to the new product line. These advancements allow new customers to purchase a low-cost single module, then easily upgrade at any time to hyper-performance. Existing customers are eagerly replacing their older systems with the new one, re-using their existing sensors and leveraging their prior experience through the backward compatible PC-based data analysis software. To date, Computech has sold more DataMaxx units and penetrated deeper into the market than with any of their prior data acquisition products.

Keywords: Multiple processors, Analog and Digital signal conditioning, Microchip PIC18F8680 16/8-bit RISC processor, automotive industry standard CAN bus, SD Card, full custom LCD glass design

Responsibilities: Principle engineer, all phases of project development: system architecture, enclosure design, electronics design, custom LCD design, autorouter & printed circuit board design, prototype assembly & testing, firmware programming & debugging, communications protocol development, PC software development, documentation, manufacturing support, and 2nd-tier technical customer support.

Thompson Vocal Eliminator VE-4

3+ Years

Problem: LT Sound was selling a full-analog product allowing professional artists to sing voice-overs on popular music, by electronically eliminating the original artist's voice from the recording – much more than just a high-end Karaoke machine. In order to remain competitive in the market, they needed to bring a new, more flexible and powerful product to market.

Solution: The solution was an all-digital version of the Thompson Vocal Eliminator. In the new design, all of the audio processing was done by an advanced digital signal processor, communicating with the outside analog worlds through a separate "codec" chip. Also incorporated were a custom power supply, flash memory, a secondary processor for user interface control and anti-pirating security, and a digital A/V interface. Development required the complex simultaneous use of three different emulator systems. Today, the VE-4 has more than twice the functionality of the prior VE-3, and LT Sound biggest difficulty is keeping enough units on the shelf.

Keywords: Analog Devices ADSP-21065L SHARC 32-bit digital signal processor, Crystal (Cirrus Logic) CS4226 Surround Sound Codec, MAX796CSE switching power supply, Microchip PIC16C63 processor, CS8405 Digital Audio Interface Transmitter

Responsibilities: Principle engineer: design of system architecture, electronics, user interface, autorouter & printed circuit board; prototype assembly & testing; firmware programming & debugging; digital signal processing software development & testing; documentation; and consumer Internet upgrade software.

Embedded Systems using Microchip PIC and Motorola 6800 families

15+ Years

Problem: Design and successfully bring to market sixteen (16) different consumer products for four different clients.

Solution: Each product embodied a unique degree of sophistication, with development time varying widely, from just a few weeks for individual products, to several years for product families. In each case, use the best-fit microprocessor, from 8- to 32-bit, from Microchip to Analog Devices. Interesting features not mentioned elsewhere on this page include: a patented reaction timer, atmospheric sensors, embedded IEEE floating point, motion sensors, and the overlay of real-time numeric automotive performance data on top of moving video recorded from inside a race car.

Product List: TachTime, TachTime Sportsman, TachTime Drag, DataPro-45, DataMaxx Main, DataMaxx LCD, DataMaxx Analog, DataMaxx EGT, Patented Vehicle Reaction Timer, Phat, RaceAir, RaceAir Pro, EGT Plus, RaceAir Pager, VE-4, LapZapper)

Responsibilities: Complete development cycle – architecture, design, development, prototyping, testing, manufacturing, 2nd tier customer support, and all aspects between.

LapZapper 900 MHz RF race car timing & scoring system

2 Years

Replace the Sports Car Club of America's antiquated manual timing and scoring system with an automated electronic one, using 900 MHz antenna signaling, thus avoiding the need to cut a line across the track.

Integrated Circuit Design

3+ Years

Design integrated circuit chips: a high-speed CMOS EPROM family for an IC manufacturer (including actual IC design, testing, and fabrication), a high-speed digital CMOS SOS military communications IC with 68000 interface, a unique bit-serial multiply-and-accumulate chip for systolic arrays; and a gate array RS-232 baud rate conversion chip (dual buffered UART).

I got into this race car electronics stuff rather indirectly. My wife volunteered at Road Atlanta, and we both worked track-side for several years. Then, I wanted to drive! I modified an old Saab 99 and raced in SCCA amateur and pro classes. Well, there used to be this spot at Road Atlanta, where you go down a hill, reaching top speed, and then back up and around a corner while under a bridge. You aim to hit the bridge abutment, but miss because the car slides. I wanted to brag to my friends how fast I was going, but taking your eyes off the road means crashing! Data acquisition systems (data recorders) cost too much. Having a Ph.D. in Electrical Engineering, I decided to build my own. I eventually made a business of it – TachTime was specialized for road racers and circle trackers. Later, Computech Systems had me customize a couple versions for drag racers. They later bought the product rights, and paid me to develop DataPro and DataMaxx. Over 15 years later, DataMaxx sells for less (even after inflation) with over 100 times the performance of TachTime.

Intranet, Internet and e-commerce experience:

Developed three automated credit card authorization systems: two using state-of-the-art Internet credit card gateways; the other using remote Omron terminals communicating through asynchronous modems with 3780 bi-sync communications directly to federal banking host with no intervening gateway

Automated clearing house communications and formatting for electronic funds transfers

Automated credit card authorization system using remote omron terminals communicating through asynchronous modems with 3780 bisync communications to banking host

Designed, implemented, installed, and maintain intelligent user-interface web pages (PHP) for collecting citizen petition signatures and forwarding them to state legislators

Designed, implemented, installed, and maintain online shopping cart software for Voter Choice Coalition and 527 non-profits

Designer and webmaster for Forefront Inc., Peachtree International Film Society, and Voter Choice Coalition and 527 non-profits

Designed, implemented, installed, and maintain website credit card acceptance gateway for Voter Choice Coalition and 527 non-profits.

Business and project management experience:

Founder and president of Forefront Inc.: Specializing in software consulting and consumer electronic product development. In software, responsibilities include client relations and billing. In electronics, responsibilities include all aspects of product development (pc host software, embedded programming, circuit development and design, board layout and packaging design, testing), production, marketing, sales, accounting, and customer support. All other aspects of business management included in responsibility as well, such as employees, payroll, taxes, etc.

For BSC: Senior programmer and group manager for several business and accounting software development projects.

Assistant Director of the Peachtree International Film Society, an Atlanta-based 501(c)3 non-profit cultural educational organization. Responsibilities included managing up to 100 volunteers, each at one of a variety of responsibility levels; all relating to producing special events, coordinating publications and advertising, accommodating out-of-town VIP's, event ticketing, membership dues processing, accounting.

Chairman of a 527 non-profit organization: Responsibilities include managing hundreds of volunteers statewide in hierarchical county structure, producing regular publications online and in print, processing membership dues and contributions, accounting, organizing and chairing annual business convention as well as monthly Executive Committee meetings, use of Roberts Rules of Order, press releases, and public appearances.

I have managed projects with hundreds of workers and hundreds of thousands of dollars at stake. However, I am most proud of the custom home I built. Using multiple CAD programs, I designed a space-optimized structure, featuring multiple extreme cantilevers and a 9' by 75' rear window overlooking hundreds of private wooded acres with a mountainous backdrop. After directly assisting in creating engineering blueprints, I began full-time work leading my crew of 7+ as we worked side-by-side for 15 months. Together, we hand-built an award-worthy home, framed with light-gauge steel and steel-reinforced concrete; finished with traditional appearance roofing, siding, and interior drywall; and perfected with finely hand-crafted wood and steel architectural features. Being full custom, the house brought me daily challenges on guiding the work of individual crew members, keeping everyone productive during slow times, and maintaining high quality workmanship during rush times. In parallel, I also located, qualified, and supervised dozens of specialized contractors. Overall, contractors did about 20% of the work, while my crew and I did 80%. My new home is nothing less than spectacular, and I get to enjoy it every day. Once again, this was a project that I led from beginning to end, with superior results.