Sean Halle

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Overview/Summary

Sean is an inventor who has worked on many creative projects. The most recent is a custom wifi router that accurately locates client devices to within 50cm. Other projects have included the first low-cost oscilloscope to use a TV as display (in the early 90's), a phase correcting digital crossover that eliminates time shifts between audio frequency bands, and a robot that performed in modern dances. Sean has also had a career in enterprise software and in research, holding a PhD in parallel computation.

skills

languages: Assembly (PIC, MIPS, ARM, x86, 8051, Z80, 6502), C, C++, Java, Python, shell, VHDL

Tools: IAR workbench, MPLab, Simulink, Matlab, MathCAD, Git, Mercurial, SVN

Skills: PCB layout, digital circuit design, analog circuit design, power electronics

Education

May 1992: UC Berkeley, BSEE, Dept. of Electrical Engineering and Computer Science.

May 1994: UC Berkeley, MSEE, Dept. of Electrical Engineering and Computer Science.

Thesis on *Experimental Chaos*. Published the first papers on "Gain from Chaos," "Spread Spectrum Communication Using Chaos," and "Secure Communication Using Chaos." The papers, combined, have 680+ citations. Advisor: Leon O Chua.

June 2011: UC Santa Cruz, PhD, Dept. of Computer Engineering.

Dissertation on *theory of parallel computation and tools for delivering performance-portable parallel software*. Advisors: Albert Cohen (INRIA, Paris), and Jose Renau (UC Santa Cruz).

Experience

Jun '14 to present Freelance project work, including a VLSI voltage mode synchronous Buck converter in TSMC .35u analog process, a PID motor controller for medical diagnostic test equipment, a recommendation system for TV programs based on click streams collected from set top boxes.

Apr '14 to Jun '14 Designed system of wifi routers that locate a mobile device to within 50cm. Employs ARM microcontroller and OpenWRM router software.

Apr '13 to Apr '14: ERCIM Fellow, Post-Doctorate researcher at CWI, Amsterdam.

Advanced the proto-runtime system for parallel runtime systems. Applied it to the Reo language and the ABS language, and created a generalization for distributed memory models. Produced a formal theory of synchronization constructs and proofs of the generality of the proto-runtime approach.

Jul '12 to Apr '13: Applied the classification style embedded neural network chip produced by Cognimem Inc to major Machine Learning algorithms. Involved PCB design, chip design, and coding in C.

Jun '11 to Jun '12: Post-doctorate researcher at Technical University Berlin.

Oversaw 6 students who worked on the design of a low-power GPU that is free from programming and application restrictions, verifying a fundamental model of parallel computation, improvement of the proto-runtime approach, and implementation of the HWSim language using proto-runtime.

Apr '08 to Apr '11: INRIA, Paris and Ecole Normale Supereur: Performed research on Portable High Performance Parallelism.

Demonstrated DKU and BLIS framework in Java and in C, running on multi-core shared memory machines, a heterogeneous collection of them and on the Cell processor. Designed WorkTable and HWSim parallel programming langugaes. Created the proto-runtime toolkit, a hardware abstraction to simplify creation and implementation of parallel languages.

Sept '03 to Apr '08: UC Santa Cruz: Performed research on a theory of parallel computation, and developed a programming system for performance-portable software called CodeTime, in addition to an analytic performance model for out-of-order pipelines.

Apr '02 to Sept '03: Designed an implemented a DSP based digital crossover that employs a novel technique to frequency and phase correct commodity drivers and to time-align the wavefronts leaving the audio drivers, including sub-woofer. Resulted in superior perceived experience from low cost drivers.

Dec '00 to Apr '02: Nevik Networks: As Chief Software Architect, designed and was responsible for the team implementing a telecom abstraction layer that provides web-based end-customer provisioning of big-iron class 5 switches as well as soft-switches. Led development, drove requirements gathering and scoping of the product. Company folded in 2002.

Dec '99 to Dec '00: SRI International: A member of SRI's enterprise software consulting spin-off. Designed a high speed trading system for Deutsche Bank's fixed income securities market. Co-architected, for American Century, an integrated financial system. Contributed papers analyzing and detailing electronic exchanges. Technical lead on implementation of a financial planning services exchange. Company folded in 2000.

Apr '98 to Dec '99: Started Halle Sound Research. Designed, built, and sold audio power amplifiers, electronic crossovers, and novel topology switching power supplies (a new class called half-forward flyback), along with speakers for professional audio sound reinforcement.

Mar '96 to Dec '97: ProSide Inc. Designed and acquired funding for a novel architecture that fuses SIMD with SPMD. Targeted at 3D graphics, was also a general "loop accelerator" that appeared as smart-memory. Developed base programming language and tools.

Jan '95 to Jan '96: Digital Equipment Corporation: Evaluated advanced high speed digial logic technologies for use in Alpha processors. Evaluated adiabatic logic, Time-Stationary Computation, and other low power, high speed approaches. Invented five new VLSI logic families and a novel division technique based on deduction. Designed high speed pseudo-self-timed array multiplier for low cost Alpha core and StrongArm VLIW coprocessor using a combination of static, domino, and differential cascode (DCVSL) logic.

Jun '93 to Jan '95: During this period, engaged in multiple projects. Designed, built, and programmed a robotics platform, based on 68HC11 microcontroller, that was employed in modern dances by the "run for your life, it's a dance company" theater troupe. Also, designed, wire-wrapped, and coded Verilog for a Xilinx FPGA based oscilloscope that displayed output on TV screen, and cost $40 in parts and materials.

Designed and built an oscilloscope that used lasers and servo mounted mirrors to project signal traces on 20 ft size screens or walls. Implemented a stack-based processor using TTL parts and wirewrap.

Personal References

These persons are familiar with my professional qualifications and my character:

Will be provided post-interview.