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## Interests

Component-oriented software architecture, data engineering, data operations, distributed computing, conversational computing, numerical/scientific computing, agile/scrumb methodology, relentless refactoring, self-explanatory code, test-driven development, polyglottalism, systems/infrastructure, machine arithmetic, embedded systems, hardware/software co-design, expository/technical writing and presentation.

## Technical skills

Java, Go, Ruby, Groovy, Python, Unix shells, SQL, C/C++, multiple assembly languages, LaTeX. Git, Mercurial, CVS, SVN. Linux, Solaris, AIX, IRIX; system calls, signals, sockets; TCP/IP internals. IEEE floating point, fixed point, DDAs, FFTs.

## Employment history

### Amazon Web Services, Herndon, Virginia

*Software development engineer*

June 2013 – present

### Two Sigma Investments, New York, New York

*Quantitative software developer*

June 2010 – May 2013

Architected and implemented a robust and reliable framework for generation of multiple terascale datasets in a proprietary streaming NoSQL framework; significantly improved maintainability, efficiency, and end-user satisfaction; made possible previously unapproachable lines of research. Created scalable management/metric-acquisition/visualization tools for compute/disk farms which enabled decision-making to improve job-scheduling and user experience while avoiding hardware outlays. Liaised between research, infrastructure, and development groups. Drove process improvement through the full software-development life cycle: tech-lead role, championing of agile-scrumb development, design, development, documentation, package management, unit testing, regression testing, and ongoing feedback loop with customers. Java, Groovy, and Ruby, with some SQL, on Linux.

### University of Arizona Department of Mathematics, Tucson, Arizona

*Graduate research/computing/teaching assistant*

Aug. 2005 – May 2010

Research: Markov chain Monte Carlo and high-performance computing applied to statistical mechanics; C and Python on Linux; designed and coded first-ever simulation of interacting random spatial permutations. Instruction with full responsibility: college algebra, trigonometry, and calculus.

### Lockheed Martin Integrated Systems and Solutions, Goodyear, Arizona

*Senior embedded software engineer* (over academic breaks)

Aug. 2004 – Aug. 2007

Simulated and verified FPGA-accelerated digital signal processing solutions; C/C++ and assembler on Unix and Linux. Designed, implemented, documented, regression-tested, and analyzed performance of custom hardware and assembler for linear algebra, FFTs, and Householder transformations in a fraction of the expected time.

### Avnet Design Services, Phoenix, Arizona

## *Applications engineer*

Oct. 2000 – Jul. 2004

Developed embedded-systems software (PowerPC, ARM, Xilinx FPGAs) for hardware verification, device drivers, and operating-systems ports (Linux, uClinux, uCOS, VxWorks). Developed host software in C and Perl on NT and Linux. Implemented networking protocols (TCP/IP, ARP, ICMP, UDP, HTTP, BOOTP) and a RAM/flash-backed filesystem from scratch. Developed and documented board-bringup protocols which have found enduring uptake by electrical engineers with limited software background.

## **Lockheed Martin Reconnaissance Systems, Goodyear, Arizona**

### *Software engineer*

Apr. 1998 – Oct. 2000

Implemented and tested ASIC-accelerated digital signal processing algorithms in a supercomputing environment, with focus on FFTs and radar processing; C/C++ on Unix. Improved regression time by two orders of magnitude.

## **Motorola Emtex Healthcare Division / Eclipsys, Phoenix, Arizona**

### *Software engineer*

Apr. 1996 – Apr. 1998

### *Support engineer*

Jun. 1994 – Apr. 1996

Revitalized transaction-processing and socket-communication subsystems of a distributed medical information system; Unix/C and TCP/IP sockets. Improved database resynchronization times by an order of magnitude. Invented and implemented supportability tools for tracing and troubleshooting distributed systems.

## **Education**

- PhD Mathematics, Statistics minor, University of Arizona (Tucson) May 2010
- M.A. Mathematics, Arizona State University (Tempe) May 2005
- B.S. Mathematics and Physics, University of Arizona (Tucson) May 1993

## **Links**

- Documents: <http://johnkerl.org>
- Software repository: <http://johnkerl.github.com>
- Blog: <http://exegetotrope.blogspot.com>
- LinkedIn: <http://www.linkedin.com/in/johnkerl>