

TRENT W. JOHNSON

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EXPERIENCE

Advanced Micro Devices, August 1999 to Present (Austin, TX & Work-from-home, Chicago, IL)
Senior Member of Technical Staff, Product Engineering Operations
(promoted 4 times with 3 years at the current title)

Technical Lead – Graphics Processor System-Level Test, 2012-Present

- Aligning System-Level Test processes between Graphics Processing Unit(GPU), Accelerated Processing Unit(APU) and Computational Processing Unit(CPU) product lines.
- Implementing diagnostic-software repository and software release improvements.
- Researching cache-resident instruction based tests based on system-level tests.

Technical Lead – Test Strategy, 2011-2012

- Directed the requirements, budget, design, and test of a board that implements a full PC system to test a GPU while still in the wafer.
- Modeled cost and capacity scenarios of several Known-Good Die initiatives.
- Co-developed protocol-aware ATE methodologies for GPU.
- Worked with team members and managed equipment resources at several worldwide offices.
- Implemented software automation to test a GPU in a system in conjunction with a wafer prober.
- Managed outside equipment and software vendors.

Software Lead – System Test Technologies, 2007-2011

- Technical software lead for fault-tolerant automated system-level test platforms for AMD's mobile, desktop, and server microprocessor product lines. Managed and mentored 5 software developers and defined a C++ programming framework used by over 30 software developers. Maintained consistency, scalability, supportability, and reliability of this critical-path production testing software.
- Developed a reliable software build and release process.
- Designed hardware abstraction software which supports over 20 unique system-level test boards.
- Designed and implemented a methodology to enable and disable refrigerant compressors based on power demand for a refrigerant-based thermal controller.
- Created the C++ programming interface for many of AMD's internal and 3rd-party thermal control systems using proprietary low-level DSP command interface.

Equipment Development Engineer – System Test Technologies, 2004-2007

- Architected and designed a new line of low-cost test equipment called Hybrid System Test that combines the functionality of burn-in, system-level test and JTAG-based test. Also led the team as architect for the microprocessor testing software of this system test platform, primarily using C++ and XML.
- Developed several thermal controller diagnostics to detect bus errors, electrical contact problems, DSP firmware defects, and thermal control problems.
- Debugged several electrical noise issues on system-level test platforms.

System-Level Diagnostic Engineer – Advanced Test and Characterization Group, 2002-2004

- Designed and coded the RIGGINS and MAGNUM random test code generators using C++, assembly language, and raw opcode encodings. These two tools have proven useful in identifying several processor bugs and speed-paths in the Athlon and Opteron product lines. These processor diagnostics are now a standard part of AMD's production test flow and continue to be augmented to play a larger role in AMD's processor testing strategy.

Burn-in Engineer – Product Development Engineering, 1999-2002

- Acted as the primary production contact for Hybrid Burn-In, a low-cost burn-in and testing fixture for the Athlon and Duron product line. Verified and debugged thermal, mechanical and electrical problems that affected yield or quality. Developed production test software for new silicon testing techniques using this burn-in system. Submitted 3 invention disclosures on use of this burn-in technology.

- Identified many mechanical interference problems on test fixtures and provided design changes to the mechanical engineering teams.

Waller Creek Communications, Inc., August 1997 to December 1997 (Austin, TX)
System Administrator / Telephone Switch Administrator

- Administered UNIX and Windows NT servers.
- Installed, configured and administered fiber-optic telephone carrier systems.

Onramp Access, Inc., May 1996 to August 1997 (San Antonio, TX)
Website Designer and Technical Support

- Maintained and installed Cisco routers and modems arrays.
- Technical customer support
- Graphics and web site design
- Network administration
- Internet consulting.
- Supported several UNIX platforms, such as IRIX, BSD, LINUX, and SunOS

PATENTS AND AWARDS

Best Paper Award, "Testing GPUs in Mission Mode on Wafer Probe," AMD Technology Showcase, 2012

Trent Johnson, et al. "Method and apparatus for remote BIOS configuration control." U.S. Patent 7,873,824, January 18, 2011

Trent Johnson, et al. "Burn-in using system-level test hardware." U.S. Patent 7 519 880, April 14, 2009

Trent Johnson. "Method and system for self-assembling instruction opcodes for a custom random functional test of a microprocessor." U.S. Patent 7 404 110, July 22, 2008

Trent Johnson. "Method and system for testing a memory of a microprocessor." U.S. Patent 7 254 509, August 7, 2007

AMD Corporate Technical Achievement Award, November, 2006

PRESENTATIONS

Trent Johnson, "Testing GPUs in Mission Mode on Wafer Probe," AMD Technology Showcase, Austin, TX, USA, 2012

Trent Johnson, "Hybridization of AMD test Equipment," AMD Seminar Series, Austin, TX, USA, 2011

Trent Johnson, "Using Position Test History to Automatically Disable Rogue Sockets," Burn-in and Test Socket Workshop, Mesa, AZ, USA, 2011

Trent Johnson, et al. "Determining Thermal Resistance Characteristics Without a Power Sensor," Burn-in and Test Socket Workshop, Mesa, AZ, USA, 2007

Trent Johnson, et al. "A Wireless Motion System for Video Gaming," International Conference for Consumer Electronics, Las Vegas, NV, USA, 2005

Trent Johnson. "DUT-Host: DUT-Level Burn-In System Diagnostic Tool," Burn-in and Test Socket Workshop, Mesa, AZ, USA, 2003

SKILLS

Engineering

- Debugging silicon, software and hardware systems with ease.
- Knowledgeable in thermal control challenges and thermal diodes

- Formulation of optimal technical approaches based upon changing business and technical requirements.
- Design of safety-oriented manufacturing systems.
- Creation of diagnostics for complex systems such as microprocessors and other equipment.
- Design and implementation of fault-tolerant and fault detecting software.
- Design of realistic system-level-testing scenarios.

Hardware Architectures

- Very well-versed in x86/x86-64 assembly using AT&T and Intel syntaxes, and the SIMD instruction set extensions such as MMX, SSE, or other newer SSE variants.
- Encoding x86 and x86-64 instructions.
- Experienced with TCP/IP and its client/server applications on UNIX, and Windows.
- Knowledge of PCI, PCI-Express and Hyper Transport bus architectures.

Software

- Programming C++ with experience and skill, and knowledgeable in Perl, Ruby, Expect, various shells.
- Familiar with the concepts of OpenCL and parallel algorithm programming.
- Administration of Pre-Boot Execution Environment (PXE) system management infrastructures.
- Experienced with Agile software development processes.
- Experienced with software version control systems such as Subversion and CVS.
- Experienced with using issue tracking systems such as Jira and continuous build systems like Bamboo.

Business

- Modeling cost of operating different manufacturing scenarios.
- Managing and mentoring of engineers
- Managing relationships with 3rd-party vendors
- Understanding of the global manufacturing model

Interpersonal

- Communication of technical issues effectively with local and worldwide colleagues.
- Written and spoken intermediate French and spoken German at a beginner level.

EDUCATION

M.S., Electrical Engineering, The University of Texas at Austin, 2005

Academic Interests: Fault modeling and fault simulation; fault tolerance in hardware and software; speed-path analysis during SOC design; control theory (digital, analog, and mixed signal)

Thesis: Optimizing Computer System Level Test Code Generation with the RIGGINS Random Test Code Generator

Adviser: Dr. Nur Touba, General Motors Foundation Centennial Teaching Fellow in Electrical Engineering

B.S., Electrical Engineering (with honors), The University of Texas at Austin, 2001

HOBBIES

- Amateur radio operator, Extra Class
- Automotive work on new and antique cars
- Home brewing, All-grain
- Microcontrollers
- Toastmasters
- Metal work