

# MARK D BELLOWS

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## Professional Summary

Experienced Computer Hardware Verification/Validation Engineer with 20+ Years Mentoring & Solving Vexing Problems

## Skills

- Debug of SW/HW (Software (code) and Hardware (logic)) bugs
- Cross-Functional Team Leadership.
- Developing / Implementing Tests
- Training / Mentoring / Helping
- C++, perl, python VHDL, Verilog, FPGA programming
- Linux, Unix, Windows
- Organizer - staff & technical - planning and implementing validation projects
- Resolver - solves problems using automation

## Work History

**System Validation Engineer**, 09/2014 to Current

**Intel Corporation** – Hillsboro, OR

- Validated SOC (System on Chip) with internal & external content increasing coverage
- Operating System Validation using off-the-shelf applications
- Established Synthetic Validation using internal and external applications and methods - finding 8 hardware bugs in 10 weeks
- System Bring-up using software and hardware to debug issues in record breaking time of 4 weeks - these systems contain multiple cores, new functional logic blocks, memory & IO
- Tested concurrency and functionality of many units: GPU, CPU, Memory (DDR3,DDR4, LPDDR4) IPU (Image Processing Unit), GMD (Graphics, Media and Display)
- Field support of debug critical customer issues isolating critical bug at low temperatures
- Found and Triaged power management bugs
- Leading teams - across geographies - India, Malaysia, Israel
- Proved successful working within tight deadlines and fast-paced atmosphere
- Monitored and maintained engineering disk space reducing wasted space by 10%
- Created & established methods to reduce defects from previous known problems bugs

**Advisory Engineer**, 09/1992 to 04/2014

**International Business Machines** – Rochester, MN

- DDR3/DDR4 memory controller validation for proper function finding logic design bugs
- Virtual system modeling to improve quality - modeling processor, memory and IO.
- Silicon Bring-up, lab tool for p/i/z Series, finding firmware and hardware issues.
- Flash memory testing for SSD retention and survivability
- Verification of PCI - for correct function and no failures in customer product - complex IO

bridge chip had only one logic bug that was fixable by software.

- Power Reduction - ESD survivability analysis - feeding back predicted failure mechanism for robust design
- Network Processor Design - congestion control for reliability and function
- Memory Controller Design for PS3 (Sony/Toshiba/IBM) creating fastest console in market at that time - design was also flexible & used in first super computer to reach sustained 1.0 peta-flops.
- Cache/Coherency controller validation for bug removal finding many bugs in logic of complex memory interfacing unit.
- 32/64Bit FPU validation - root causing problems in calculations, optimizations and internal checkers

## Projects

### **Intel Core Gen 14 Processor — Synthetic Validation Lead (North)**

Intel Consumer processor validated with new content, validating 8 different IPs, developing novel testing methods

**Intel Low Power Gen 11 & Gen 9 Processors — Memory Validation** Intel Consumer and Devices Processors - verifying memory controllers and subsystems.

**IBM i/p/zSeries PowerPC A25, RS64-II, III, IV** - cache controller validation-verification, memory controller design, network processor design, floating point unit verification

## Awards

**US Patents** 22 granted in the areas of Memory and Networking

**First Synthetic Graphic Media and Display Tests** integrated two different methodologies

**Presidential Volunteer Service Award** Mentoring youth & teaching LEGO robotic training

## Education

**Masters of Science:** Electrical Engineering

**University of Minnesota** - Minneapolis, MN

Parallel Processing/ Computer Architecture / Networks / Memory Bus Compression

**Bachelors of Science:** Electrical & Computer Engineering, Mathematics

**Brigham Young University** - Provo, UT

## Extracurricular

- Toastmasters (ACB,ALB)
- B.S.A. Wood Badge

## LinkedIn

- [www.linkedin.com/in/markdbellows](http://www.linkedin.com/in/markdbellows)