

David B. Lavo
418 Locust St.
Santa Cruz, CA 95060
lavo@soe.ucsc.edu
<http://sctest.cse.ucsc.edu/lavo>

Current Research

Development of model-independent and analytical fault diagnosis, and modular design techniques for VLSI test and debug

Education

University of California Santa Cruz:
Ph.D. in Computer Engineering, September 2002
M.S. in Computer Engineering, June 1996
B.S. in Computer Engineering, June 1993

Research interests

- Diagnosis of faults in CMOS circuits, including unmodeled or unexpected fault behaviors and multiple faults
- Modular RTL methodologies for test and DFT
- High-performance, limited-precision arithmetic coding for data compression

Publications

D. B. Lavo, I. Hartanto, and T. Larrabee. **Multiplets, Models, and the Search for Meaning: Improving Per-Test Fault Diagnosis.** *Proceedings of the International Test Conference (ITC 02)*, IEEE Press, Piscataway, N.J., 2002, pages 250-259.

D. B. Lavo and T. Larrabee. **Making Cause-Effect Cost Effective: Low Resolution Fault Dictionaries.** *Proceedings of the International Test Conference (ITC 01)*, IEEE Press, Piscataway, N.J., 2001, pages 278-286.

D. B. Lavo. **A Good Excuse for Reuse: "Open" TAP Controller Design.** *Proceedings of the International Test Conference (ITC 00)*, IEEE Press, Piscataway, N.J., 2000, pages 1090-1091.

D. B. Lavo, T. Larrabee, and J. Colburn. **Eliminating the Ouija® Board: Automatic Thresholds and Probabilistic IDDQ Diagnosis.** *Proceedings of the International Test Conference (ITC 99)*, IEEE Press, Piscataway, N.J., 1999, pages 1065-1072.

Publications (continued)

D. B. Lavo, B. Chess, T. Larrabee, and Ismed Hartanto. **Probabilistic Mixed-Model Fault Diagnosis.** *Proceedings of the International Test Conference (ITC 98)*, IEEE Press, Piscataway, N.J., 1998, pages 1084-1093.

J. Saxena, H. Balachandran, K. Butler, D. B. Lavo, B. Chess, T. Larrabee, and F. J. Ferguson. **On Applying Non-Classical Defect Models to Automated Diagnosis.** *Proceedings of the International Test Conference (ITC 98)*, IEEE Press, Piscataway, N.J., 1998, pages 748-757.

D. B. Lavo, B. Chess, T. Larrabee, and F. J. Ferguson. **Diagnosing Realistic Bridging Faults with Single Stuck-At Information.** *IEEE Transactions on Computer-Aided Design*, March 1998, pages 255-268.

D. B. Lavo, B. Chess, T. Larrabee, F. J. Ferguson, J. Saxena, and K. Butler. **Bridging Fault Diagnosis in the Absence of Physical Information.** *Proceedings of the International Test Conference (ITC 97)*, IEEE Press, Piscataway, N.J., 1997, pages 887-893.

B. Levine, D. B. Lavo, and J.J. Garcia-Luna-Aceves. **The Case for Concurrent Reliable Multicasting Using Shared Ack Trees.** *Proceedings ACM MultiMedia 1996*, Boston, MA, November 18-22, 1996.

D. B. Lavo, T. Larrabee, B. Chess. **Beyond the Byzantine Generals: Unexpected Behavior and Bridging Fault Diagnosis.** *Proceedings of the International Test Conference (ITC 96)*, IEEE Press, Piscataway, N.J., 1996, pages 611-619.

B. Chess, D. B. Lavo, F.J. Ferguson, and T. Larrabee. **Diagnosis of Realistic Bridging Faults with Single Stuck-at Information.** *Proceedings of the International Conference on Computer-Aided Design (ICCAD 95)*, IEEE Press, Piscataway, N.J., 1995, pages 185-192.

Patents

US Patents 6,560,736 and 6,202,181. **Method for Diagnosing Realistic Bridging Faults in Integrated Circuits.** May 6, 2003 and March 13, 2001 (with F.J. Ferguson, T. Larrabee, and B. Chess).

Awards (Graduate)

- ACM Doctoral Dissertation Award nomination
- Honorable Mention Paper Award, ITC 1998
- 1998 SRC Inventor Recognition Award
- MICRO Fellowship

Awards (Undergraduate)

- Highest Honors in the Major
- National Merit Scholarship
- Regents Scholarship

Languages & Technical Skills

- C / C++ / STL
- Windows API / MFC / Visual C++
- Windows kernel & file-system development
- Cross-platform (Windows – Unix) code development
- Perl & Tcl/Tk
- HTML / DHTML / CGI / Javascript
- Java
- Logic design / Verilog / Verilog PLI
- Logic synthesis (Synopsys Design Compiler)

Experience

October 2002 – Present

University of California, Santa Cruz
Santa Cruz, CA

POSTDOCTORAL RESEARCHER --- Research into model-independent and low-cost fault diagnosis techniques. This work focuses on ways to make diagnosis both more efficient and more adaptable. The research includes novel techniques to greatly reduce the size of pre-computed diagnostic data sets, and analytical methods for diagnosing complex and multiple faults. Continuing work on integrating industry-standard data formats and tools, to make the diagnosis techniques as practical and as widely applicable as possible. Involves the writing and publication of conference and journal papers, as well as collaboration with and guidance of graduate student researchers.

November 1996 – April 2003

Agilent Technologies/Hewlett-Packard Company
Santa Clara & Palo Alto, CA

R&D TEST ENGINEER --- Implementation of diagnosis techniques and tools on production ASICs, including significant design and coding of novel diagnosis tools in C++, and incorporation into an industrial CAD tool flow. Assisting the debug and failure analysis on several production ASICs. Also, development of novel boundary-scan tools and techniques, including the invention of a modular TAP-based test methodology. In addition, test and DFT tool development, designer support, documentation, and training.

September 1994 – June 2002

University of California, Santa Cruz
Santa Cruz, CA

GRADUATE STUDENT RESEARCHER --- Research into the diagnosis of bridging and other faults in CMOS circuits. This project included the design and implementation of a (UNIX) program to compare faulty behaviors with stuck-at fault signatures and produce accurate diagnosis. The diagnostic procedure produces accurate (non-misleading) diagnoses of small size for the vast majority of bridging fault behaviors tested, even in the face of highly unexpected fault behaviors.

April 2003 - Present

February 2000 – December 2001

March 1994 -- September 1995

Thuridion Software Engineering
Santa Cruz, CA

SR. SOFTWARE ENGINEER --- Recurring consulting on a variety of commercial software projects that require particular programming, research, analytic or computational expertise. Current project involves the development of novel techniques to protect copyrighted video and audio, and the security analysis and hardening of a streaming music service. Previous projects included the design and implementation of several medium-scale commercial software products, including thermodynamic calculation tools, office productivity applications, and security and data-exchange subsystems for large Internet database applications. These projects involved scientific calculation and graphing, user interface and page layout design, and public-key cryptosystems. Most projects were implemented in C/C++, Microsoft MFC, and/or Windows DDKs for various platforms. Some projects included substantial amounts of client management and presentation.

Professional References

Rob Aitken

Artisan Components Inc.
141 Caspian Court
Sunnyvale, CA 94089

aitken@artisan.com

(408) 548-3297

Manager at both Hewlett-Packard and Agilent Technologies (11/96 – 4/03), and member of doctoral thesis committee.

Peter Maxwell

Agilent Technology
5301 Stevens Creek Blvd.
MS 51L-GO
Santa Clara, CA 95051

peter_maxwell@agilent.com

(408) 345-8927

Colleague and collaborator on R&D team at both Hewlett-Packard and Agilent Technologies (11/96 – 04/03).

F. Joel Ferguson

Baskin Engineering, UC Santa Cruz
1156 High St., 231 BE
Santa Cruz, CA 95064

fjf@soe.ucsc.edu

(831) 459-4172

Research collaborator and co-author on several publications, and member of doctoral thesis committee.