

Dee A. B. Weikle

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Crozet, VA 22932

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Education

Ph.D Computer Science University of Virginia, May 2001
Dissertation: "Caches As Filters: A Framework for the Analysis of Caching Systems"
Masters of Computer Science University of Virginia, May 1996
B.S. Electrical Engineering Rice University, May 1985
(fulfilled requirements for a B. A. Computer Science, Rice University, May 1985)

Research Interests

Computer systems architecture with an emphasis on analytical modeling and performance evaluation methodologies. Mathematics, computer science and engineering education.

Honors

Recipient, "NSF Advance Fellows Award: Caches as Filters Benchmark Characterization and Demonstration", 2004.
Best Paper Award, "Caches As Filters: A New Approach to Cache Analysis"
Sixth International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS'98)

Publications

Journal

M. Co, D. A. B. Weikle, K. Skadron, "Evaluating Trace Cache Energy-Efficiency," ACM Transactions on Architecture and Code Optimization, 2006.

S. A. McKee, Wm. A. Wulf, J. H. Aylor, R. H. Kelnke, M. H. Salinas, S. I. Hong, and D. A. B. Weikle, "Dynamic Access Ordering for Streamed Computations", IEEE Transactions on Computers, November 2000, pp. 1255-1271.

Conference/Workshop

P. Sitthi-amorn, D. A. B. Weikle, K. Skadron. "Exploring the Impact of Normality and Significance Tests in Architecture Experiments," In Workshop on Modeling, Benchmarking, and Simulation (MoBS), held in conjunction with International Symposium on Computer Architecture (ISCA), June 2006.

M. Co, D. A. B. Weikle, K. Skadron, "A Break Even Formulation for Evaluating Branch Predictor Energy Efficiency", In Workshop Proceedings of the International Conference of Computer Architecture (ISCA), June 2005.

D. A. B. Weikle, S. A. McKee, K. Skadron, Wm. A. Wulf, "Caches As Filters: A Framework for the Analysis of Caching Systems", Grace Murray Hopper Conference 2000, Sept. 14-16, 2000.

D. A. B. Weikle, S. A. McKee, Wm. A. Wulf, "Caches As Filters: A New Approach to Cache Analysis", Sixth International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS'98), July 19-24, pp. 2-12, Montreal, Canada.

Technical Reports

J. Meng, D. A. B. Weikle, G. Humphreys, K. Skadron, "An Approach on Hardware Design for Computational Photography Applications based on Light Field Refocusing Algorithm", University of Virginia, Department of Computer Science, Technical report CS-2007-15, November 2007.

J. Meng, D. A. B. Weikle, K. Hazelwood, "ParaWeaver: Performance Evaluation on Programming Models for Fine Grained Threads", University of Virginia, Department of Computer Science, Technical Report CS-2007-09, May 2007.

J. Meng, H. Cook, K. Skadron, D. A. B. Weikle, "Comparing Doom 3, WarCraft III, PBRT, and MESA Using Micro-architecturally Independent Characteristics", University of Virginia, Department of Computer Science, Technical Report CS-2007-04, 2007.

M. Co, D. A. B. Weikle, and K. Skadron. "Potential for Branch Predictor Adaptation at the Program and Phase Level for Performance and Energy-Efficiency." University of Virginia, Department of Computer Science Technical Report No. CS-2005-19, November, 2005.

D. A. B. Weikle, K. Skadron, S. A. McKee, Wm. A. Wulf, "TSpec: A Notation for Describing Memory Reference Traces", University of Virginia, Department of Computer Science, Technical Report CS-2000-23, August 2000.

D. A. B. Weikle, K. Skadron, S. A. McKee, Wm. A. Wulf, "Caches As Filters: A Unifying Model for Memory Hierarchy Analysis", University of Virginia, Department of Computer Science Technical Report CS-2000-16, June 2000.

S. A. McKee, D. A. B. Weikle, and Wm. A. Wulf, "TSpec: A Specification of Memory Access Traces", University of Virginia, Department of Computer Science Technical Report CS-97-19, August, 1997.

D. A. B. Weikle, and Wm. A. Wulf, "TGEN: Programmer's Reference Manual", University of Virginia, Department of Computer Science, Technical Report CS-97-22, August, 1997.

S. A. McKee, D. A.B. Weikle, K. L. Wright, C. W. Oliver, A. P. Voss, M. H. Salinas, R. H. Klenke, T. C. Landon, Wm. A. Wulf, and J. H. Aylor, "Avoiding Irreproducible Results: Modeling the Stream Memory Controller", University of Virginia, Department of Computer Science, Technical Report CS-95-50, October 1995.

Grants Awarded

Project Parallax

Principal Investigators: Catherine Brighton, Tonya Moon
Other Senior Personnel: Dee A. B. Weikle, Garrick Louis, Irina Mitrea, Glen Bull, Carol Tomlinson, John Park, Bill Ferster, Tim Konold
Javits Gifted and Talented program, administered by the Office of Elementary and Secondary Education of the U.S. Dept. of Education
Amount: \$2,500,000
Period of Support: 5 years beginning October 1, 2008.

Caches as Filters Benchmark Characterization and Demonstration

Principal Investigator: Dee A. B. Weikle
NSF Award Number, ADVANCE Fellows Award: [CNS-0340813](#),
Amount: \$266,626
Period of Support: 05/15/04-04/30/07.

Summary Teaching Related Activities (Context/Details Below)

University of Virginia Courses

- CS493 – Undergraduate Seminar, Architecture Simulation Methodology, Fall 2006.
Co-Instructor: Kevin Skadron. Students read selected papers and traced applications using CHUUD tools on the MacIntosh Platform for use in multi-core research.
- ENGR-162 – Introduction to Engineering Workshop, Fall 2003.
Lectured, designed project and all assignments, graded all assignments.
Rating: 3.63 100-Level Course Mean: 3.57
- CS493: Seminar in Memory Systems Architecture, Spring 1996.
Co-Instructor: Wm. Wulf. Prepared course syllabus, selected readings, supervised projects, and assisted in evaluation of students.
- CS101: Introduction to Computer Science, Instructor: J. Prey, Spring 1994.
Supervised lab section, graded lab and homework assignments.

Other Instructional Experience

- Geometry - Upward Bound Program, University of Virginia, Summer 1993.
- Motorola 68000/88000 Training Sessions, 1989-1992.
Created, organized, and presented training sessions for field application engineers including week-long session in Hong Kong.

Professional Experience

05/08-present Consultant

Curry School of Education, University of Virginia, Charlottesville, VA

Collaborators: Dr. Tonya Moon, Dr. Catherine Brighton

Developing problem-based STEM curriculum in the elementary grades to help identify gifted and talented students of a diverse background and improve educational opportunities in rural southwest Virginia.

05/04-05/08 Research Scientist

Department of Computer Science, University of Virginia, Charlottesville, VA

Benchmark Characterization and Demonstration Project

Principal Investigator: Dee A. B. Weikle

Performed analysis on benchmarks. Co-advised PhD students. Advised first-year undergraduates. Senior thesis advisor. Co-taught seminar course for undergraduate/graduate students. Formed liaison with Curry school faculty, participated in K-12 curriculum development projects.

09/03-05-04 Adjunct Professor

Undergraduate Dean's Office, University of Virginia, Charlottesville, VA

Lecturer: ENGR-162, first year design course

This course provides an overview of the engineering profession and the disciplines and functions within engineering. It also introduces students to engineering design, and the role of creativity in the solution of open-ended (design) problems. Course includes a significant, hands-on, project. Our project centered on Syndrome X. Students designed and built an interactive display outlining the risks of Syndrome X, complete with bicycles that could be ridden and speed reflected on lights on display. Students surveyed community before and after demonstration to determine effectiveness of display. Class included lectures, discussion sessions, and final project. Also developed web pages for ABET accreditation for engineering school.

Instructor Rating: 3.63 *All 100-Level Course Mean Instructor Rating:* 3.57.

01/94-05/01 Graduate Research Assistant

Department of Computer Science, University of Virginia, Charlottesville, VA

Memory Access Analysis (MACE) project

Principal Investigators: Wm. A. Wulf and Alan P. Batson

Developed analytical measures for determining effectiveness of caches. Designed and developed software tool for the computation and display of measures. Designed trace generation processor and developed trace language. Co-advised undergraduate theses.

1/96-5/96, 1/94-5/94 Teaching Assistant

Department of Computer Science, University of Virginia, Charlottesville, VA

CS493: Seminar in Memory Systems Architecture, Instructor: Wm. Wulf

Prepared course syllabus, selected readings, supervised projects, and evaluated students.

CS101: Introduction to Computer Science, Instructor: J. Prey

Supervised lab section, graded lab and homework assignments.

6/93-7/93 *Instructor*

Upward Bound Program, University of Virginia, Charlottesville, VA
Taught five-week geometry course to twenty high school students from disadvantaged backgrounds. Created course content, including lectures, tests, and homework assignments. Graded all assignments and evaluated students.

8/91-3/92 *RISC Technical Communications Manager*

Motorola Microprocessor and Memories Technologies Group, Austin, TX
Supervisor: Gary Montgomery
Educated field engineering and sales personnel on RISC microprocessor products. Lead teams for two separate, week-long training sessions for approximately fifty engineers. (Presented one session alone in Hong Kong.) Defined training content, organized materials, and arranged facilities.

5/89-8/91 *Applications Engineer*

Motorola Microprocessor and Memories Technologies Group, Austin, TX
Supervisor: Clara Serrano
Provided applications support to customers and Motorola design engineering for M88000 RISC products. Promoted in September 1990. Completed technical, managerial, and marketing projects.

Designed top-level of display interface for 3D Graphics Controller using and 88100 and two 96000s. Presented design concepts to customers and field engineering.

Troubleshoot customer technical problems from coding errors to loading and layout issues. Assisted in definition of timing specifications. Reviewed technical documentation, including user's manuals, technical summaries, and application notes. Wrote application notes.

Managed four separate, three-month rotations through department as a senior group engineer. Those supervised included two cooperative students, one recent graduate, and one exchange engineer from Japan. Created and defined rotation projects. Guided, motivated, and evaluated employees. Organized and tracked all customer problems reported to group. Coordinated resolutions with design engineering.

Marketing accomplishments included creation and repeated presentation of two-day seminar for sales force, conception and supervision of glossy, four-page product brochure and compilation of product graphics material into applications book.

10/86-5/89 *Engineer Scientist* (Avionics)

Tracor Aerospace, Austin, TX
Supervisor: Jerry Hewell

Served as an electrical engineer for the Omega Navigations System product line. Promoted in 1987. Responsibilities consisted of technical and managerial tasks. Introduced technical improvements in the product line by redesigning components and

printed wiring boards. Assisted in the redesign of an ASIC device used as a Harvard-architecture RISC microprocessor. Ensured successful completion of this time-critical project by identifying potential problems and appropriate solutions for management. Improved efficiency of production-line test and repair areas by debugging previously designed test equipment. Encouraged use of this equipment by writing clear documentation and training technicians. Responsibilities included acting as a part-time manager for the Avionics section of Electrical Engineering for approximately six months. As an engineer and manager, organized certain aspects of the department by introducing methods for tracking all tasks in work, and establishing priorities for each.

6/85-10/86 *Engineer Scientist* (Telecommunications)

Tracor Aerospace, Austin, TX

Supervisor: Bill Dicke

Served as Project Engineer for the last phase of a test set for Tracor's Fixed Record Communications Terminal. Scheduled and prioritized engineering tasks, tracked progress of support groups, and facilitated successful completion of the program by restoring customer's confidence during a three-week equipment demonstration. Also, produced design changes, drawings, and tested equipment.

Professional Societies

Association for Computing Machinery (ACM)

Institute of Electrical and Electronics Engineering (IEEE)

Conferences/Training Sessions Attended

Math Specialist Instructors Workshop March 30-31, 2008.

Best Practices Institute (UVA) March 6-8, 2008.

High Performance Computer Architecture February, 2005 and 2007.

Service Learning in Engineering May, 2006.

Int. Symp. on Workload Characterization Fall, 2005 and 2006.

Service

Program Committee, IEEE International Symp. on Workload Characterization, 2006.

Program Committee, International Conference on Parallel Processing, 2006.

New Investigators Papers Committee, Grace Murray Hopper Conference, 2004.

University of Virginia, Charlottesville, VA

10/97 – 10/98 Computer Science Dept., GSG Steering Committee.

Fall 94, 95, 97 Computer Science Dept. Orientation Week Mentor.

5/94 – 5/96 Computer Science Dept. Library Committee.

8/95 – 5/96 Computer Science Department, Faculty/Student Social Organizer.

Collaborators

Dr. Sally McKee, Chalmers University, Gothenburg, Sweden.

Dr. Kevin Skadron, Dept. of Computer Science, University of Virginia.

Dr. Tonya Moon, Curry School of Education, University of Virginia.

Dr. Catherine Brighton, Curry School of Education, University of Virginia.

Dr. Garrick Louis, Dept. of Systems Engineering, University of Virginia.

Graduate Advisor: Dr. William Wulf, AT&T Professor, Dept. of Computer Science, University of Virginia. Past- President, National Academy of Engineering.

Graduate Co-Advisors: Dr. Kevin Skadron, Dr. Sally McKee

Graduate Advisees:

Dr. Michele Co, Research Associate, Dept. of Computer Science, University of Virginia
Thesis: “Designing Energy-Efficient Fetch Engines”, Graduated PhD: August, 2006.

www.cs.virginia.edu/~mc2zk/

Email: michele.co@gmail.com

Jiayuan Meng, PhD Student, Dept. of Computer Science, University of Virginia

www.cs.virginia.edu/~jm6dg/

Email: jerrygonair@hotmail.com

Undergraduate Advisees:

Rachel House, Thesis: “How A Computer Works: Teaching Computer Architecture Concepts to Students Aged Ten Through Twelve”, Graduated: May, 2007.

Renee En Tsou, Thesis: Website for ENGR162 Students, Graduated: May 2006.