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Research & Career Interests

Multiprocessor/multicore systems, real-time systems, computer science education, adaptive systems, parallel and distributed algorithms, operating systems, and medical informatics.

Academic Appointments

- Assistant Professor of Computer Science. Austin College — Fall 2010-Present
- Visiting Lecturer in Computer Science, The University of North Carolina at Chapel Hill — Spring 2010

Education

- University of North Carolina at Chapel Hill — Ph.D. in Computer Science, August 2008
- University of North Carolina at Chapel Hill — M.S. in Computer Science, May 2005
- Haverford College — B.S. in Math & Computer Science, May 2002

Dissertation

Adaptive Multiprocessor Real-Time Systems — Published August 2008

Developing and analyzing mechanisms for allowing multiprocessor scheduling algorithms for real-time systems to adapt to workload changes. These mechanisms include (but are not limited to): redistributing spare computational capacity in a relatively fair manner; changing the processor share of running tasks with minimal overhead; and using feedback-control loops to adjust system parameters. Currently, these adaptive techniques are being integrated into both the Whisper human motion tracking system and the Virtual Exposure Camera video-correction system in order to improve their responsiveness to external stimuli.
Available at http://www.aaronblock.com/aarondiss.pdf.

Fellowships

- National Science Foundation Graduate Research Fellow — 2004-2007
- University of North Carolina at Chapel Hill Computer Science Alumni Fellow — 2007

Professional Work Completed Since 2010

Publications

- A. Block and W. Kelley, "Implementing Adaptive Clustered Scheduling in LITMUS^{RT}" *Proceedings of the 11th Annual Workshop on Operating Systems Platforms for Embedded Real-Time Applications*, pp 33-35, Lund, Sweden, July 2015.

- A. Block, J. Anderson, and G. Bishop, "Fine-Grained Task Reweighting on Multiprocessors," *Journal of Embedded Computing*, special issue on multiprocessor real-time scheduling, Volume 4, Number 2, pp.71-86, 2011.

Talks

- *Implementing Adaptive Clustered Scheduling in LITMUS^{RT}* The 11th Annual Workshop on Operating Systems Platforms for Embedded Real-Time Applications, Lund, Sweden, July 2015.

Mobile Applications

- *Seven Second Diet*. iPhone Application. Released 2015. Currently, on hiatus from the App Store pending a proposed update.

- *The Austin College App*. iPhone Application. Released 2011. Currently, on hiatus from the App Store pending a proposed update.

Open Source Projects

- Developed *Adaptive Clustered-Earliest Deadline First* and *Adaptive Global-Earliest Deadline First* plugins for the *Linux Testbed for Multiprocessor Scheduling in Real-Time Systems* (LITMUS^{RT}). The GitHub repository for LITMUS^{RT} is located: https://github.com/LITMUS-RT. Developed plugins will become publicly accessible once the LITMUS^{RT} community has completed validating the plugins.

Articles

- A. Block, "Why I want Swift to be your first language." Published on http://www.aaronblock.com/. Aug 24, 2015.
  - Viewed over **15,000 times**.
  - Cited on *Daring Fireball* (the most popular Apple-focused technology website on the Internet) on Aug 27, 2015. http://daringfireball.net/linked/2015/08/27/swift-comp-sci
  - The creator of Swift, Chris Lattner, promoted the article via Twitter. https://twitter.com/AaronBlock/status/635904711288320000

Professional Work Completed Prior to 2010

Products Released

- *Microsoft Visual Studio Team Foundation Server 2010*. Located at: https://www.microsoft.com/en-us/download/details.aspx?id=15070

Publications

- A. Block, J. Anderson, and U. Devi, “Task Reweighting under Global Scheduling on Multiprocessors,” *Real-Time Systems*, special issue on selected papers from the 18th Euromicro Conference on Real-Time Systems, Volume 39, Number 1-3, pp. 123-167, August 2008.

- A. Block, B. Brandenburg, J. Anderson, and S. Quint, "Adaptive Multiprocessor Real-Time Scheduling with Feedback Control," *Proceedings of the 20th Euromicro Conference on Real-Time Systems*, pp. 23-33, Prague, Czech Republic, July 2008.

- B. Brandenburg, J. Calandrino, A. Block, H. Leontyev, and J. Anderson, " Real-Time Synchronization on Multiprocessors: To Block or Not to Block, to Suspend or Spin?," *Proceedings of the 14th IEEE Real-Time and Embedded Technology and Applications Symposium*, pp. 342-353, St. Louis, Missouri, April 2008.

Publications (Continued)

- B. Brandenburg, A. Block, J. Calandrino, U. Devi, H. Leontyev, and J. Anderson, "LITMUSRT:A Status Report," *Proceedings of the 9th Real-Time Linux Workshop, Proceedings of the 9th Real-Time Linux Workshop*, pp. 107-123, Linz, Austria, November 2007.

- A. Block, H. Leontyev, B. Brandenburg, and J. Anderson, "A Flexible Real-Time Locking Protocol for Multiprocessors," *Proceedings of the 13th IEEE International Conference on Embedded and Real-Time Computing Systems and Applications*, pp. 47-57, Daegu, South Korea, August 2007.

- R. Hamm, S. Knoop, P. Schwarz, A. Block, and W. Davis, "Harmonizing Clinical Terminologies: Driving Interoperability in Healthcare," *Proceedings of the 12th World Congress on Health* (*Medical*) *Informatics* (*Medinfo 2007*), pp. 660-663, Brisbane, Australia August 2007.

- J. Calandrino, H. Leontyev, A. Block, U. Devi, and J. Anderson, "LITMUS-RT: A Testbed for Empirically Comparing Real-Time Multiprocessor Schedulers," *Proceedings of the 27th IEEE Real-Time Systems Symposium*, pp. 111-123, Rio De Janeiro, Brazil, December 2006.

- A. Block and J. Anderson, "Accuracy versus Migration Overhead in Real-Time Multiprocessor Reweighting Algorithms," *Proceedings of the 12th International Conference on Parallel and Distributed Systems*, pp. 355-364, Minneapolis, Minnesota, July 2006.

- A. Block, J. Anderson, and U. Devi, "Task Reweighting under Global Scheduling on Multiprocessors," *Proceedings of the 18th Euromicro Conference on Real-Time Systems*, pp. 128-139, Dresden, Germany, July 2006.

- A. Block, J. Anderson, and G. Bishop, "Fine-Grained Task Reweighting on Multiprocessors," *Proceedings of the 11th IEEE Conference on Embedded and Real-Time Computing Systems and Applications*, pp. 429-435, Hong Kong, China, August 2005.

- A. Block and J. Anderson, "Task Reweighting Multiprocessors: Efficiency versus Accuracy," *Proceedings of 13th International Workshop on Parallel and Distributed Real-time Systems*, Denver, Colorado April 2005. (On CD ROM)

- J. Anderson, A. Block, and A. Srinivasan, "Quick-release Fair Scheduling," *Proceedings of the 24th IEEE Real-time Systems Symposium*, pp. 130-141, Cancun, Mexico, December 2003.

Talks

- "Adaptive Multiprocessor Real-Time Scheduling with Feedback Control," *The 20th Euromicro Conference on Real-Time Systems*, July 2008.

- "Adaptive Multiprocessor Real-Time Systems" invited talk *Haverford College*, December 2007.

Talks (Continued)

- "Adaptive Multiprocessor/Multicore Real-Time Systems and Multimedia Applications," *IBM Almaden Research Center*, August 2006
- "Accuracy versus Migration Overhead in Real-Time Multiprocessor Reweighting Algorithms," *The 12th International Conference on Parallel and Distributed Systems*, July 2006.
- "Task Reweighting under Global Scheduling on Multiprocessors," *The 18th Euromicro Conference on Real-Time Systems*, July 2006.
- "Fine-Grained Task Reweighting on Multiprocessors", *The 11th IEEE Conference on Embedded and Real-Time Computing Systems and Applications*, August 2005.
- "Task Reweighting Multiprocessors: Efficiency versus Accuracy", *International Workshop on Parallel and Distributed Real-time Systems*, April 2005.

Industry Experience

Program Manager, Microsoft — 2008-2010
Working on the *Team Foundation Server* (TFS) product, a suite of enterprise-grade collaborative development tools comprising version control, work item tracking, reporting, and document sharing. Responsibilities involve: designing administrative features (including, but not limited to, authentication, disaster recovery, client-certificate interoperability, installation); managing the escalation of customer problems from Microsoft's support origination to the TFS product group; overseeing security requirements for TFS; producing customer facing technical documents; and working with customers to solicit feedback. *Promotion(s)*: September 2009. *Supervisor*: Doug Neumann

Research Intern, IBM Alamaden Research Center — Summer 2006
Worked with the *Interoperable Health Information Infrastructure* group to develop the Regional Health Information Organizations Directory Service, which is an extension of the Lightweight Directory Access Protocol (LDAP) designed to provide a directory of medical applications. Also helped to develop the basics of translating between different medical terminologies.
Supervisor: James Kaufman.

Software Design Engineer in Test Intern, Microsoft — Summer 2001
Worked with *RTC.NET* to develop the packet capture and pump testing application that recorded packets transmitted over the Internet from one RTC.NET application to another and could replay them to construct testing scenarios. Also participated in standard testing duties. *Supervisor*: Leonidas Rigas.

Industry Experience (continued)

Software Engineer in Test Intern, Microsoft — Summer 2000
Worked with *NetMeeting* to develop a whiteboard testing application, which allowed a developer to construct specific testing scenarios using simple scripting tools. Also participated in standard testing duties.
Supervisor: Roger Harrison.

Teaching Experience

Classes Taught at Austin College
Spring 2015

- CS 111: Computer Science for Scientists
- CS 211: Core Fundamentals I
- CS 290: Practicum in Computer Science
- CS 420: Operating Systems

Fall 2014

- CS 110: Introduction to Computer Science
- CS 221: Core Fundamentals II
- CS 410: Programming Languages

Spring 2014

- CS 111: Computer Science for Scientists
- CS 211: Core Fundamentals I (co-taught with Michael Higgs)
- CS 380: Software Engineering (co-taught with Michael Higgs)
- CS 412: Data Structures and Algorithms
- CS 470: Theoretical Foundations of Computer Science

January 2014

- GS 100: The Bicycle

Fall 2013

- CS 110: Introduction to Computer Science
- CS 221: Core Fundamentals II
- CS 412: Data Structures and Algorithms

Spring 2013

- CS 111: Computer Science for Scientists
- CS 211: Core Fundamentals I
- CS 420: Operating Systems

Fall 2012

- CS 110: Introduction to Computer Science
- CS 221: Core Fundamentals II

- CS 410: Programming Languages

Spring 2012

- CS 110: Introduction to Computer Science
- CS 221: Core Fundamentals II
- CS 412: Data Structures and Algorithms

January 2011

- GS 100: The Bicycle

Fall 2011

- CI 101: Logic and its Limitations
- CS 110: Introduction to Computer Science
- CS 211: Core Fundamentals I (co-taught with Professor Michael Higgs)
- CS 470: Theoretical Foundations of Computer Science

Spring 2011

- CS 110: Introduction to Computer Science
- CS 221: Core Fundamentals II
- CS 420: Operating Systems

Fall 2010

- CS 110: Introduction to Computer Science
- CS 250: Objective-C
- CS 410: Programming Languages

Classes taught at The University of North Carolina at Chapel Hill

- COMP110: Introduction to Programming—Spring 2010
- COMP524: Program Language Concepts — Spring 2007

Conferences Attended Since 2010

- *The 11th Annual Workshop on Operating Systems Platforms for Embedded Real-Time Applications* and *The 27th Euromicro Conference on Real-Time Systems*. Co-located in Lund, Sweden, July 2015.
- *The 9th Annual International Computing Education Research (ICER) Conference.* August 2013

Recent Academic Activities

- Reviewed submissions for the journal *Real-Time Systems*.
- Invited Program Committee Member: *20th IEEE Real-Time and Embedded Technology and Application Symposium,* Work in Progress session. Berlin, Germany.
- Invited Program Committee Member: *22th Euromicro Conference on Real-Time Systems*, Brussels, Belgium.
- Reviewed submissions for: Euromicro Journal of Systems Architecture (JSA)