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RESEARCH INTERESTS

Context Awareness, Ubiquitous and Mobile Computing, System Level Energy Management

EDUCATION

Ph.D. Computer Science. May 2007. Duke University. Durham, NC.
Data Fidelity Mechanisms for Enhancing Energy Management in Context-Aware Systems
Adviser: Dr. Carla S. Ellis
M.S. Computer Science. May 2003. Duke University. Durham, NC.
Adviser: Dr. Carla S. Ellis
B.S., Computer Engineering. May 1998. Virginia Tech. Blacksburg, VA.

RESEARCH EXPERIENCE

Postdoctoral Fellow: April 2007-present, with Dr. Christine Julien
The University of Texas at Austin, Department of Electrical and Computer Engineering,
Mobile and Pervasive Computing Group

Involved in multiple research projects on context-aware communication in Mobile Ad-Hoc Networks (MANETs), including a novel routing protocol (CDR-H), a passive network context sensing infrastructure, and an application design tool (Chameleon). Overseeing graduate and undergraduate student research on middleware for embedded sensor applications.

Research Assistant: 2002-2006, with Dr. Carla Ellis
Duke University, Department of Computer Science

Designed and conducted research exploring energy management for mobile, context-aware computing systems. Created CAFE, or Context-Awareness Fidelity Expression, a framework for explicitly incorporating data fidelity into system design and implementation. Developed FaceOff, a context based display power management system, as a test bed to research use of low power sensors for energy management. Conducted a user study of FaceOff.

Research Intern: May 2005 to August 2005, with Dr. Richard E. Harper
Thermal Diagnostics and Server Energy Management, Server Systems Research, IBM Corporation, Research Triangle Park, NC.

Analyzed IBM BladeCenter power dissipation under varying workloads using AME (Autonomic Management of Energy). Ported Thermal Diagnostics to Linux running as Xen domain to create a prototype platform for Continuous Availability Manager (CAM). Provided technical guidance and

consultation to two other interns working on scheduling workloads and frequency manipulation for energy management. Coauthored two invention disclosures leading to patent filings.

**Research Intern: May 2004 to August 2004, with Dr. Richard E. Harper
Hosted Client Energy Management, Server Systems Research, IBM Corporation, Research Triangle Park, NC.**

Developed a method for scheduling hosted client workloads on physical machines to reduce energy consumption while minimizing unmet demand. Implemented prototype version of the system that runs on IBM BladeCenter hardware with VMWare ESX Server 2.1.

**Research Intern: May 2003 to August 2003, with Dr. Maria Ebling
Context Tailor Project, T.J. Watson Research Center, IBM Corporation, Hawthorne, NY.**

Implemented a Context Tailor enabled Backup Utility Invoker Application. Designed Context Tailor Usability Study and implemented an Invocation Monitor component of Context Tailor middleware for Usability data capture. Culminated in publication of a workshop paper and a conference paper submission.

PROFESSIONAL EXPERIENCE

Development Engineer: May 2000 to February 2003 - *ServeRAID Firmware Development, Adaptec Corporation, IBM Corporation (until April 2002), Research Triangle Park, NC.*

- Core member of Design and Development Team for strategic object-oriented firmware architecture. Responsible for definition and ground up development in C++ of new RAID Configuration Manager.
- New feature design, implementation, and integration into existing firmware C code base. Conduct and participate in design reviews, feature reviews, and defect status meetings. Support and maintenance of firmware code base as hardware platform evolves.
- Interface with Level 2 Support team, product engineering, and competitive analysis to determine future customer requirements and profile competitive products. Present feature proposals, conduct product reviews and evaluations.

Manufacturing Test Engineer June 1998 to May 2000 - *Worldwide Server Manufacturing Engineering, IBM Corporation, Research Triangle Park, NC.*

- Worked closely with hardware and firmware development teams in successfully delivering two high-end servers to market.
- Responsible for manufacturing end to end test process for servers including card functional and ICT testing, assembly verification, system monitored operation, run in, final system verification, system debug, and out of box audit testing. Developed and maintained diagnostics C code for server manufacturing tests.
- Participated in planning and execution of strategic worldwide projects to promote increased test coverage and commonality across worldwide manufacturing sites.

TEACHING EXPERIENCE

**Teaching Assistant: Advanced Operating Systems
Spring 2004, Spring 2005
Duke University**

- Worked with course instructor to create Linux based programming assignments in an effort to provide real world experience to students
- Set up and managed Xen environment to host Linux Guest virtual machines for projects
- Assisted students on course subject matter and programming assignments
- Graded programming assignments through interactive demonstrations with student groups

**Teaching Assistant: Introduction to Operating Systems,
Fall 2003, Spring 2004, Fall 2005
Duke University**

- Led three weekly recitation sections to go over problem sets, review for exams, discuss programming projects, and teach extra course material related to programming projects
- Adapted and created Xen-based Linux programming assignments as a replacement for Nachos assignments for Fall 2005
- Assisted students during scheduled office hours and by appointment as well as through online bulletin board system
- Graded group Nachos and Linux programming assignments through interactive demonstrations with student groups

PUBLICATIONS

CAFE: Figuring Out When Less is More in Context-Aware Systems, Angela Dalton, Carla Ellis, and Christine Julien, under review, July 2007

Modeling Protocol Performance in Ad Hoc Sensor Networks, Taesoo Jun, Angela Dalton, Shreeshankar Bodas, Christine Julien, and Sriram Vishwanath, under review, July 2007

SmokeScreen: Flexible Privacy Controls for Presence-Sharing, Landon P. Cox, Angela Dalton, Varun Marupadi, *Fifth International Conference on Mobile Systems, Applications, and Services*, April 2007

Presence-Exchanges: Toward Sustainable Presence-Sharing, Landon P. Cox, Angela Dalton, Varun Marupadi, *Seventh IEEE Workshop on Mobile Computing Systems and Applications*, April 2006

Exploiting Context Data Fidelity for Enhanced Privacy and Energy Savings, Angela B. Dalton, Carla S. Ellis, and Abhijit Vijay, *Workshop on Context Awareness* at the Second International Conference on Mobile Systems, Applications and Services, June 2004.

Mobile Computing at the Beach, Justin Mazzola Paluska, Angela Dalton, Prasad Boddupalli, Amit Saha, Athanasios E. Papathanasiou, Santashil Palchadhuri, *IEEE Pervasive Computing*, vol. 03, no. 1, pp. 89-92, January-March, 2004.

Context-sensitive Invocation Using the Context Tailor Infrastructure, Davis, J., Sow, D., Dalton, A., Ebling, M., *System Support for Ubiquitous Computing Workshop* at the Fifth Annual Conference on Ubiquitous Computing, October 2003.

Sensor-Enhanced Energy Management for Mobile Devices, Angela B. Dalton and Carla S. Ellis, May 2003, TR CS-2003-14.

Sensing User Intention and Context for Energy Management, Angela B. Dalton and Carla S. Ellis, *Ninth Workshop on Hot Topics in Operating Systems (HotOS)*, May 2003, also as TR CS-2003-03.

PATENTS

“Automatic Workload Apportionment According to Mean and Variance”. Inventors: P. Bland, Y. Chen, A. Dalton, A. Das, R. Harper, W. Piazza. Patent pending (2007).

“A Method of Detecting Recirculation of Heated Air within a Rack Enclosure”. Inventors: W. Piazza, R. Harper, A. Dalton, T. Bradisch. Patent pending (2006).

“A Method of Detecting Obstructions to Airflow and Temperature Sensor Faults for Rack Equipment with Low Utilization”. Inventors: A. Dalton, R. Harper, W. Piazza, T. Bradisch. Patent pending (2006).

POSTER/DEMO PRESENTATIONS

SASSI: The Sliverware Architecture for Sensor System Integration, Seth Holloway, Alexander Griffith, Angela Dalton, Drew Stovall, and Christine Julien, under review, July 2007

FaceOff: A Sensor-Enhanced Display Power Management System for Mobile Devices, Angela Dalton and Carla Ellis, demo presentation at the Fifth IEEE Workshop on Mobile Computing Systems and Applications (WMCSA), October 2003

AWARDS

Outstanding Master’s Thesis Award, Duke University Department of Computer Science, 2003
SOSP Student Scholarship, 2003
Grace Hopper Celebration Student Scholarship, 2002

PROFESSIONAL ACTIVITIES

Co-Founder and Board Member, UT Graduate Women in Computing, 2007
Panelist, MobiSys 2004 Workshop on Context-Awareness, Privacy Panel
Member, Institute for Electrical and Electronic Engineers (IEEE)
Member, IEEE Computer Society
Member, Association for Computing Machinery (ACM)