

Daniel Grobe Sachs

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Objective:

Take on a challenging embedded-system research, design, or development role that will allow me to exercise my diverse skill set.

Skills:

- Embedded software design and development
- Hardware/software interfaces and hardware abstraction layers
- C and Python languages
- IAR and Freescale Codewarrior development environments
- Linux development and administration
- System architecture, including design and design documentation
- System-level hardware design, including component selection and interfaces between boards and components as well as hardware bring-up and debugging
- 802.15.4, ZigBee, and Wireless HART networking
- Familiarity with a wide variety of embedded microcontrollers

Experience:

- Software Technologies Group, Inc. 2006–present: Member of technical staff
- University of Illinois at Urbana-Champaign, 1998–2006: Research and teaching assistant
- Internships at Motorola (1998), Intel (2000), and MIT Lincoln Labs (2001)
- US Army Construction Engineering Research Labs (CERL), 1995–1998

As an engineer at Software Technologies Group, I have been involved in a variety of projects centering on low-power wireless sensing and controls, including leading the engineering and design effort on two of these projects. I have also been responsible for software component development on several other projects, and for the development of the firmware for several ZigBee devices sold by STG. In addition to my software and design work, I also regularly participate in the design of new hardware at STG, review hardware schematics and PCB layouts before production, and bring up and test new or unproven hardware.

One important assignment at STG was the development of the cross-platform radio and timing abstractions for the WiTECK Wireless HART stack (<http://www.witeck.org>), which have permitted us to successfully port the stack onto several very different hardware platforms.

Education:

- B.S. Computer Science, University of Illinois at Urbana-Champaign, 1998
- M.S. Electrical Engineering, University of Illinois at Urbana-Champaign, 2000
- Ph.D. Electrical Engineering, University of Illinois at Urbana-Champaign, 2006

- NSF Research exchange fellowship at Tokyo University, Summer 2003.
I spent a summer working at Tokyo University on an NSF research exchange program, and have a limited ability to converse in spoken Japanese.

Research summary:

I was responsible for the architecture and design of much of the NSF-funded UIUC GRACE multimedia power-saving platform (<http://rsim.cs.uiuc.edu/grace>). This was a multidisciplinary project to design and construct a system that reconfigures each component in a wireless-equipped multimedia laptop to reduce power consumption (and hence increase battery lifetime) while preserving or improving the performance of applications running on the system. This research has been published in my dissertation and in peer-reviewed papers and conference proceedings included in the list below.

Selected publications:

Sachs, D. G. and Jones, D. L. "Stochastic Resource Allocation for Energy-Constrained Systems," *EURASIP Journal on Wireless Communications and Networking*, Vol. 2009, Article ID 246439, 14 pages, June 2009.

Vardhan, V.; Yuan, W.; Harris, A. F.; Adve, S.; Kravets, R.; Nahrstedt, N.; Sachs, D. G.; Jones, D. L. "GRACE-2: Integrating fine-grained application adaptation with global adaptation for saving energy." *International Journal of Embedded Systems*, Vol. 4, No. 2, 2009.

Sachs, D.G.; Kozintsev I.V.; Yeung, M.M. "Method for multimedia communication over packet channels." U.S. Patent 7,095,729, issued August 22, 2006.

Sachs, D. G. "A new framework for hierarchical cross-layer adaptation." Ph.D dissertation, University of Illinois at Urbana-Champaign, 2006.

Sachs, D. G.; Yuan, W.; Hughes, C. J.; Harris, A.; Adve, S. V.; Jones, D. L.; Kravets, R. H.; Nahrstedt, K. "GRACE: A hierarchical adaptation framework for saving energy." Computer Science, University of Illinois Technical Report UIUCDCS-R-2004-2409, Feb. 2004.

Sachs, D. G.; Adve, S. V.; Jones, D. L. "Cross-layer Adaptive Video Coding to Reduce Energy on General-Purpose Processors." *Proceedings of the International Conference on Image Processing 2003*, Barcelona, Spain, Sep. 2003.

Majumda, A.; Sachs, D. G.; Kozintsev, I. V.; Ramchandran, K.; Yeung, M. M. "Multicast and unicast real-time video streaming over wireless LANs." *IEEE Transactions on Circuits and Systems for Video Technology*, Vol. 12, No. 6, June 2002.