

# Neven M. Abou Gazala (AKA . Nevine AbouGhazaleh)

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## EDUCATION

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- PhD (Candidate) in Computer Science; 2003- present, GPA 3.8 / 4.0  
University of Pittsburgh, Pittsburgh, PA. (Expected graduation: August 2007)  
*Thesis title:* Cross-layer Approach for Integrated Power Management  
*Advisors:* Rami Melhem, Daniel Mossé and Bruce Childers
- MS Computer Science; 2000-2003, GPA 3.8 / 4.0  
University of Pittsburgh, Pittsburgh, PA.  
*Thesis title:* Collaborative compiler and operating system power in real-time systems.  
*Advisors:* Rami Melhem and Daniel Mossé.
- MS Computer Engineering; 1996-1999, GPA 4.0 / 4.0  
Arab Academy for Science and Technology (AAST), Alexandria, Egypt.  
*Thesis title:* Background motion detection in compressed video database.  
*Advisor:* Yousry El-Gamal.
- BS Computer Engineering; 1991-1996, GPA 3.99 / 4.0  
Arab Academy for Science and Technology (AAST), Alexandria, Egypt.  
Graduated first in class.

## RESEARCH AND TEACHING EXPERIENCE

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- Research Assistant; Department of Computer Science, U. of Pittsburgh, 2000 – present.
  - Investigated power management policies to reduce energy consumption and improve performance in different system components such as: processor, memory and caches. My approach relied on hardware-software co-design, compiler support and machine learning.
- Summer Intern; IBM Austin Research Lab, Austin TX, Summer 2006.
  - Investigated power management techniques in server blades. Developed several power management algorithms for power allocation among servers. Filed a US patent in collaboration with IBM researchers.
- Summer Intern; HP research Labs, Palo Alto CA, Summer 2002.
  - Investigated power management in wireless cards. Devised power management policy to achieve acceptable tradeoff between transmission power and response time, which can be set by the user or automatically based on the type of applications running in the system.

## Teaching Experience

- Teaching Fellow (Instructor); Department of Computer Science, University of Pittsburgh, Spring 2006.
  - *Course taught:* Introduction to Computer Programming

- Teaching Assistant; Department of Computer Science, University of Pittsburgh, Spring 2005 – Fall 2005.
  - *Courses taught:* Introduction to Computer Programming, Computer Operating Systems, and Algorithm Implementation
- Teaching Assistant; Department of Computer Engineering, AAST, 1996 – 2000.
  - *Courses taught:* Advanced Programming Languages, Database Management Systems, Microprocessors architectures, Numerical Analysis, Microprocessor-based computer design and Discrete Mathematics.

## PUBLICATIONS

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### Refereed Journals

- [J1] N. AbouGhazaleh, B. Childers, D. Mossé, and R. Melhem, “Energy Conservation using Power-Aware Cached-DRAM”, to appear in the IEEE Transaction on Computers (TC), accepted 2007.
- [J2] N. AbouGhazaleh, D. Mossé, B. Childers, and R. Melhem, “Collaborative Operating System and Compiler Power Management for Real-Time Applications”, appeared in the ACM Transactions on Embedded Computing Systems (TECS), Feb.2006, Vol. 5, Issue1.
- [J3] N. AbouGhazaleh, B. Childers, D. Mossé, and R. Melhem, “Power Management in External Memory using PA-CDRAM”, to appear in the International Journal for Embedded Systems (IJES), accepted 2006.

### Refereed Conferences & Workshops

- [C1] C. Rusu, N. AbouGhazaleh, A. Ferreira, R. Xu, B. Childers, R. Melhem, and D. Mossé, “Integrated CPU and L2 cache Frequency/Voltage Scaling using Supervised Learning”, in Statistical and Machine learning approaches applied to ARchitectures and compilation (SMART’07), in conjunction with High-Performance Embedded Architecture and Compilation (HiPEAC), Ghent, Belgium, 2007.
- [C2] N. AbouGhazaleh, B. Childers, D. Mossé, and R. Melhem, “Near-memory Caching for Improved Energy Consumption”, in Proceedings of the International Conference of Computer Design (ICCD), San Jose, CA, 2005.
- [C3] N. AbouGhazaleh, P. Lanigan, S. Gobreial, D. Mossé, and R. Melhem, “Dynamic Rate Selection for Extending the Lifetime of Energy Constrained Networks”, Workshop on Energy-Efficient Wireless Communications and Networks (EWCN), Phoenix, AZ, 2004.
- [C4] N. AbouGhazaleh, B. Childers, D. Mossé, R. Melhem, M. Craven, “Energy Management for Real-Time Embedded Applications with Compiler Support”, ACM SIGPLAN Languages, Compilers, and Tools for Embedded Systems (LCTES), San Diego, CA, 2003.
- [C5] N. AbouGhazaleh, D. Mossé, B. Childers, R. Melhem, and M. Craven, “Collaborative Operating System and Compiler Power Management for Real-Time Applications”. IEEE-Real Time/ Embedded Technology and Applications Symposium (RTAS), Washington DC, 2003.

- [C6] D. Zhu, N. AbouGhazaleh, D. Mossé and R. Melhem; “Power Aware Scheduling for AND/OR Graphs in Multi-Processor Real-Time Systems”, International Conference on Parallel Processing (ICPP), Vancouver, Canada, 2002.
- [C7] N. AbouGhazaleh, D. Mossé, B. Childers, and R. Melhem, “Toward the Optimal Placement of Power Management Points in Real-Time Applications”, Compilers and Operating Systems for Low Power (COLP), Barcelona, Spain, 2001.
- [C8] N. AbouGhazaleh, and Y. El Gamal, “Compressed Video Indexing Based on Object’s Motion” Proc. of the SPIE Conference on Visual Communications and Image Processing (VCIP), Sydney, Australia, 2000.

#### **Under Submission**

- [C9] N. AbouGhazaleh, B. Childers, D. Mossé, and R. Melhem, “Integrated CPU and Cache Power Management in Multiple Clock Domain Processors”.
- [C10] N. AbouGhazaleh, A. Ferreira, F. Liberato, B. Childers, R. Melhem, and D. Mossé, “Compiler-based approach for Integrated CPU and L2 cache Voltage Scaling using Machine Learning”.

#### **Book Chapters**

- [B1] R. Melhem, N. AbouGhazaleh, H. Aydin, and D. Mossé; “Power Management Points in Power-Aware Real-Time Systems”, Book Chapter In Power Aware Computing, ed. By R. Raybill and R. Melhem, Plenum/Kluwer Publishers, 2002.
- [B2] N. AbouGhazaleh, D. Mossé, B. Childers and R. Melhem; “Toward the Placement of Power Management Points in Real Time Applications”, In Compilers and Operating Systems for Low Power, Kluwer Academic Publishers, 2002.

#### **Invited paper**

- [I1] N. AbouGhazaleh, D. Mossé, B. Childers, and R. Melhem, “Energy Conservation in Memory Hierarchies using Power-Aware Cached-DRAM”, Dagstuhl Seminar Proceedings 05141, 2005.

#### **Technical Reports**

- [T1] N. AbouGhazaleh, B. Childers, D. Mossé, and R. Melhem, “PA-CDRAM: Power-Aware Cached-DRAM for Energy Conservation in Off-chip Memories”, Technical Report TR-04-109, 2004.
- [T2] N. AbouGhazaleh, R. Mayo, and P. Ranganathan, “Idle Time Power Management for Personal Wireless Devices”, HP-labs Technical Report: HPL-2003-102, 2003.
- [T3] N. AbouGhazaleh, B. Childers, D. Mossé, R. Melhem, and M. Craven, “Collaborative Compiler-OS Power Management for Time-Sensitive Applications”, Technical Report TR-02-103, 2002.

**Posters and Presentations**

- [P1] Poster: "Power Management in External Memory using PA-CDRAM" ACM research competition, Grace Hopper Conference, San Diego, CA, 2006. Also appeared in the annual *CS Day*, 2006 (**best poster award**).
- [P2] Poster: "Dynamic Rate-Selection for Extending the Lifetime of Energy-Constrained Networks", Grad Expo 2006, University of Pittsburgh. Also appeared in the annual *CS Day*, 2005 (**best poster award**).
- [P3] Poster: "Collaborative Compiler and operating system for reduced power in real-time systems", Grad Expo 2005, University of Pittsburgh. Also appeared in the annual *CS Day*, 2004 (**runner-up poster award**).
- [P4] Presentation: "Toward Global Processor and Memory Power Management" PhD forum, Grace Hopper Conference, San Diego, CA, 2006.
- [P5] Presentation: "Dynamic Rate-Selection for Extending the Lifetime of Energy-Constrained Networks" Grad Expo 2005, University of Pittsburgh.

**Patent**

"Power Shifting Algorithms for Dynamically Allocating Power Budgets among Servers", Patent filed with IBM ARL researchers (Wes Felter, Charles Lefurgy, Tibor Horvath, and Tyler Bletsch) in 2006.

**PROGRAMMING SKILLS, LANGUAGES AND PLATFORMS**

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- Programming Languages: Expert with C++, Java, Python, Perl, Visual Basic, Pascal.
- Operating Systems: Have experience in Linux development; and Unix, Linux & Windows operation .
- Simulation Tools: Expert in SimpleScalar, Wattch, Mem-Sim, and CSim.

**HONORS AND AWARDS**

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**Scholarships and Fellowships**

- **Google's Anita Borg Scholarship**, academic year 2006/2007.
- **Josephine de Kármán Fellowship**, academic year 2006/2007.
- **Andrew Mellon Fellowship**, academic year 2003/2004.
- **Undergraduate scholarship**, Arab Academy for Science & Technology, 1995/1996.

**Awards**

- **Graduate Research Competition First runner-up** Awards, years: 2006 and 2007, Department of Computer Science, University of Pittsburgh.
- **Outstanding Student Citizenship** Awards, years: 2006 and 2007, Department of Computer Science, University of Pittsburgh.
- **ACM Travel Grant** to attend Grace Hopper Conference, San Diego 2006.

- **Best Poster** Awards in the annual *CS Day*, years: 2005 and 2006, Department of Computer Science, University of Pittsburgh.
- Invited to attend the first Workshop for Women Engineers sponsored by Google, 2006.
- **Graduate Research Competition Finalist**, 2003, Department of Computer Science, University of Pittsburgh.
- **ACM Travel Grant** to attend the FCRC, San Diego, 2003.
- **First runner-up Poster** Award in the annual *CS Day*, 2003, University of Pittsburgh.
- **Best Student** Award, 1993, Engineering School, Arab Academy for Science & Technology.

### **PROFESSIONAL ACTIVITIES**

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- External reviewer for the following conferences: ECTRS'07, HPCA'06, ICAC'06, ECRTS'06, ECRTS'05, DAC'04, RTSS-WIP'03, RTSS'03, RTAS'03, PACS'03, and RTAS'01.
- External reviewer for the following journals: IEEE-TC, and ACM-TECS.

### **EXTRA CURRICULUM ACTIVITIES**

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- Organizer of the Graduate Career Tips forums, U. of Pittsburgh, 2006.
- The student representative in the *CS Day* committee, U. of Pittsburgh, 2005.
- Treasurer of the Graduate Student Organization (GSO), U. of Pittsburgh, 2000 – 2002.
- President of the Student Union Organization (SUO), AAST, 1995 – 1996.
- Vice president of the Student Union Organization, AAST, 1994- 1995.
- Active Member of the Personal Computer Club (PCC), AAST, 1992 – 1994.