

Education and Academic Records

- 1997-2003 **PhD: Stanford University, California, USA**
Electrical Engineering Department, **Cumulative GPA: 4.0/4.0**
Thesis: *A Redundant Digit Floating Point System*
- 1995-1997 **MSc: Cairo University, Cairo, Egypt**
Department of Electronics and Electrical Communications
Thesis: *Novel Digital Structures Utilizing Single Electron Devices*
- 1990-1995 **BSc: Cairo University, Cairo, Egypt**
Department of Electronics and Electrical Communications, **Rank: 1st/216**
Graduation project: *Design and implementation of a 24 bit RISC processor on a VLSI chip using the sea-of-gates technology*

Teaching Experience

Cairo University, Egypt	<i>Computer Arithmetic</i> (graduate class)	Autumn 2003, 2004, 2006 to 2009
	<i>Technical English</i> (graduate class)	Autumn 2003, 2004, 2006 to 2008
	<i>Computer Architecture</i> (undergraduate class)	Autumn 2003, 2004, 2006 to 2009
	<i>Computer Architecture</i> (graduate class)	Winter 2007 to 2009
	<i>Electronics and Instrumentations Labs</i>	Winter 2004, 2005, 2009
	<i>Operating Systems</i> (TA)	Autumn 1995, 1996
Nanyang Technological University, Singapore	<i>Advanced Computer Arithmetic</i> (graduate class)	Winter 2006
	<i>Advanced Computer Architecture</i> (graduate class)	Autumn 2005
	<i>Digital Circuits and Systems</i> (Tutorials)	Autumn 2005
American University in Cairo, Egypt	<i>Digital Logic Design Lab</i>	Winter 2005
Stanford University, USA	<i>Advanced Computer Arithmetic</i> (graduate class, TA)	Winter 2003

Short course: National Authority for Remote Sensing and Space Sciences, Egypt,
On-Board Computer Systems, new employees training, June 2004.

Service to the university

- Member of the committee for the formulation of the graduate studies curriculum of the Electronics and Communications Department, 2006–2008.
- Member of the committee for the formulation of the undergraduate studies curriculum of the Electronics and Communications Department, 2007–2009.
- Member of the committee for the recording of the grades and results of the Civil Engineering Department, 2006–2009.

Industrial Research Experience

- Sep 07–present **SilMinds, Smart Village, Egypt**
Datapath design, decimal floating point blocks compliant to the IEEE Std 754-2008
- Nov 08–present **Varkon Semiconductors, Maadi, Egypt**
Digital receiver system for the DVB-C standard
- Jan 04–May 05 **International Electrical Products, 6th of October City, Giza, Egypt**
System on a chip combining the digital satellite receiver subsystem (including an MPEG decoder) with the video processor, Picture In Picture module and an embedded Sparc processor for an Integrated Digital Television
- Oct 03–Aug 04 **National Authority for Remote Sensing and Space Sciences, Cairo, Egypt**
Preliminary design of the on-board computer controlling the operation of EgyptSat2
- Jun–Sep 1999 **Advanced Micro Devices, Sunnyvale, California, USA**
Optimizations to the simulation code of a graphics hardware acceleration unit for the K8 microprocessor
- Jul–Sep 1996 **IBM T. J. Watson research center, Yorktown Heights, New York, USA**
Design of digital cells using Single Electron Transistors under a joint study program between Cairo University and IBM
- Aug–Sep 1994 **Interuniversitair Micro-Elektronica Centrum vzw (Imec), Leuven, Belgium**
Work on the topic “HF extraction of model parameters for High Electron Mobility Transistor (HEMT) devices” and using the VEE-test environment on HP workstations

Research work

1. Interests: My focus is on the datapath of digital designs from the devices that might be needed to the systems that perform the users' requirements. A good optimization of the arithmetic blocks results in an improved datapath which directly leads to a better overall design. A system level research (embedded systems and computer architecture) and device level research (current CMOS and future nanoelectronics) guide my work at the arithmetic units level. Digital typography is the second direction of my research and it is due to my deep interest in how the scholarly written information is presented.
2. Awards
 - Elevated to Senior Member of IEEE in April 2009.
 - Stanford Graduate Fellowship 1998-2002.
 - 1995 IEEE Computer Society Upsilon Pi Epsilon award for academic excellence.
3. Research services
 - Member of the working group who developed the IEEE Standard for Floating-Point Arithmetic (754–2008) published August 2008.
 - Member of the working group who is currently developing the IEEE Standard for Interval Arithmetic (P1788).
 - Technical Program Co-Chair of the International Forum on Next-Generation Multicore / Many-core Technologies, November 2008, Egypt.
 - Reviewer for the IEEE Transactions on Computers, IEEE Transactions on VLSI, IEEE Transactions on Parallel and Distributed Systems, International Journal of Circuit Theory and Application, IEEE Transactions on Circuits and Systems-I, VLSI Design, IEEE Symposium on Computer Arithmetic, IEEE International Symposium on Circuits and Systems, and a number of other conferences.

4. Funding and projects

- Co-PI in the STDF grant “Micro-Coded Programmable Solution for a Class of OFDMA Wireless Applications”, May 2009–May 2011.
- Co-PI in the RDI grant “Promoting Egypt as the first Decimal Arithmetic Intellectual Property Cores Provider for financial applications in the world”, August 2009–January 2011.

Filed Patents

At the USA patent office:

1. M. M. ElKhouly, H. A. H. Fahmy, R. Raafat, A. M. Abdel-Majeed, Y. Farouk, T. ElDeeb, and R. Samy, “A decimal square-root unit using Newton-Raphson iterations,” June 2009. US Patent application number 61187337
2. M. M. ElKhouly, H. A. H. Fahmy, A. M. Abdel-Majeed, R. Raafat, Y. Farouk, T. ElDeeb, and R. Samy, “A parallel redundant decimal fused-multiply-add unit,” June 2009. US Patent application number 61187677
3. M. M. ElKhouly, H. A. H. Fahmy, A. M. Abdel-Majeed, R. Raafat, Y. Farouk, T. ElDeeb, and R. Samy, “Rounding unit for decimal floating-point division,” June 2009. US Patent application number 61187678
4. M. M. ElKhouly, H. A. H. Fahmy, R. Samy, T. ElDeeb, Y. Farouk, A. M. Abdel-Majeed, and R. Raafat, “A decimal fully parallel floating-point fused-multiply-add unit,” June 2009. US Patent application number 61187679

Publications

Books and book chapters:

1. H. A. H. Fahmy, *Redundant digit floating point system: Providing speed and flexibility*. VDM Verlag, Aug. 2009

Papers:

1. H. A. H. Fahmy, “Design and implementation of AHD-2494, a 24-bit RISC processor on a VLSI chip,” *‘looking forward’ the IEEE Computer Society’s Student Newsletter*, 1995. (fall issue)
2. H. A. H. Fahmy and K. Ismail, “Analysis of a single-electron decimal adder,” *Applied Physics Letters*, vol. 70, pp. 2613–2615, May 1997
3. H. A. H. Fahmy, M. Morf, and R. Kiehl, “Potential functionality of multi-valued tunneling phase logic devices,” in *European Conference on Circuit Theory and Design, Stresa, Italy, Session S10-II*, Aug. 1999
4. P. Hung, H. A. H. Fahmy, O. Mencer, and M. J. Flynn, “Fast division algorithm with a small lookup table,” in *Thirty-Third Asilomar Conference on Signals, Systems, and Computers, Asilomar, California, USA*, vol. 2, pp. 1465–1468, Oct. 1999
5. H. A. H. Fahmy and R. Kiehl, “Complete logic family using tunneling-phase-logic devices,” in *The 11th International Conference on Microelectronics, ICM 99, Kuwait*, Nov. 1999
6. H. A. H. Fahmy, A. A. Liddicoat, and M. J. Flynn, “Improving the effectiveness of floating point arithmetic,” in *Thirty-Fifth Asilomar Conference on Signals, Systems, and Computers, Asilomar, California, USA*, vol. 1, pp. 875–879, Nov. 2001
7. H. A. H. Fahmy, A. A. Liddicoat, and M. J. Flynn, “Parametric time delay modeling for floating point units,” in *The International Symposium on Optical Science and Technology, SPIE’s 47th annual meeting (Arithmetic session), Seattle, Washington, USA*, July 2002
8. H. A. H. Fahmy and M. J. Flynn, “The case for a redundant format in floating point arithmetic,” in *Proceedings of the 16th IEEE Symposium on Computer Arithmetic, Santiago de Compostela, Spain*, June 2003
9. H. A. H. Fahmy and M. J. Flynn, “Rounding in redundant digit floating point systems,” in *The International Symposium on Optical Science and Technology, SPIE’s 48th annual meeting (Arithmetic session), San Diego, California, USA*, Aug. 2003

10. H. A. H. Fahmy and M. J. Flynn, "An adder for a redundant digit arithmetic unit," in *COOL Chips VII, Yokohama, Japan*, Apr. 2004
11. Y. He, C.-H. Chang, J. Gu, and H. A. H. Fahmy, "A novel covalent redundant binary booth encoder," in *The IEEE International Symposium on Circuits and Systems, (ISCAS), Kobe, Japan*, pp. 69–72, May 2005
12. S. Tawfik and H. A. H. Fahmy, "Error analysis of a powering method and a novel square root algorithm," in *The 17th IMACS World Congress Scientific Computation, Applied Mathematics and Simulation, Paris, France*, July 2005
13. S. A. Tawfik and H. A. H. Fahmy, "Algorithmic truncation of minimax polynomial coefficients," in *The IEEE International Symposium on Circuits and Systems, (ISCAS), Kos, Greece*, May 2006
14. H. A. H. Fahmy, "Typesetting the Qur'an and its specific challenges to the T_EX family," in *EuroT_EX 2006: Proceedings of the 16th Annual Meeting of the European T_EX Users, Debrecen, Hungary*, July 2006
15. H. A. H. Fahmy, "AlQalam for typesetting traditional Arabic texts," in *TUG 2006: The Annual Meeting of the International T_EX Users Group, Marrakesh, Morocco*, Nov. 2006
16. S. K. Gopi, H. A. H. Fahmy, and V. A. Prasad, "Redundant adders consume less energy," in *The IEEE Asia-Pacific Conference on Circuits and Systems, (APCCAS), Singapore*, Dec. 2006
17. H. A. H. Fahmy, "AlQalam for typesetting traditional Arabic texts," *TUGboat*, vol. 27, Jan. 2007. This paper groups the work already presented in EuroT_EX 2006 and TUG 2006
18. A. A. Essawi, H. A. H. Fahmy, and N. H. Raafat, "Characterization of a coaxial mid-gap SB CNTFET inverter," in *IMNC, 20th International Microprocesses and Nanotechnology Conference, Kyoto, Japan*, Nov. 2007
19. A. M. Sherif and H. A. H. Fahmy, "Parameterized Arabic font development for AlQalam," *TUGboat*, vol. 29, Jan. 2008. Appeared originally in EuroBachoT_EX 2007: the 17th Annual Meeting of the European T_EX Users, Bachotek, Poland
20. H. A. H. Fahmy and A. Elezabi, "Bipolar sequences correlator and squarer for multiple-access systems," in *Forty-Second Asilomar Conference on Signals, Systems, and Computers, Asilomar, California, USA*, Oct. 2008
21. R. Raafat, A. Mohamed, R. Samy, T. ElDeeb, Y. Farouk, M. Elkhoully, and H. A. H. Fahmy, "A decimal fully parallel and pipelined floating point multiplier," in *Forty-Second Asilomar Conference on Signals, Systems, and Computers, Asilomar, California, USA*, Oct. 2008
22. M. E. A. Ibrahim, M. Rupp, and H. A. H. Fahmy, "Power estimation methodology for VLIW digital signal processor," in *Forty-Second Asilomar Conference on Signals, Systems, and Computers, Asilomar, California, USA*, Oct. 2008
23. A. M. Sherif and H. A. H. Fahmy, "Meta-designing parameterized Arabic fonts for AlQalam," *TUGboat*, vol. 29, Nov. 2008. Appeared originally in TUG 2008: The Annual Meeting of the International T_EX Users Group, Cork, Ireland
24. A. M. A. Hussein, H. A. H. Fahmy, and M. M. Khairy, "Efficient hardware implementation for 802.16e double binary Turbo decoder," in *The International Conference on Microelectronics, ICM 2008, United Arab Emirates*, Dec. 2008
25. A. M. S. Tossou, H. A. H. Fahmy, and M. F. A. El-Yazeed, "DRUS: A new proposed interoperable DRM hardware-software solution," in *The 4th International Computer Engineering Conference, Giza, Egypt*, Dec. 2008
26. M. M. Harb and H. A. H. Fahmy, "Deploying electronic vehicle identification (EVI) system in developing countries," in *The 6th International Workshop on Intelligent Transportation, Hamburg, Germany*, Mar. 2009
27. M. ELSawaf, H. A. H. Fahmy, and A.-L. ElShafei, "CPU dynamic thermal management via thermal spare cores," in *The 25th Semiconductor Thermal Measurement and Management Symposium, San Jose, CA, USA*, Mar. 2009
28. H. A. H. Fahmy, R. Raafat, A. M. Abdel-Majeed, R. Samy, T. ElDeeb, and Y. Farouk, "Energy and delay improvement via decimal floating point units," in *Proceedings of the 19th IEEE Symposium on Computer Arithmetic, Portland, Oregon, USA*, June 2009

29. A. A. Al-Sallab, H. A. H. Fahmy, and M. Rashwan, "Hardware implementation of distributed speech recognition system front end," in *EUSIPCO, 17th European Signal Processing Conference, Glasgow, Scotland*, Aug. 2009
30. K. ElWazeer, M. M. Khairy, H. A. H. Fahmy, and S. E.-D.Habib, "FPGA implementation of an improved channel estimation algorithm for mobile WiMAX," in *The International Conference on Microelectronics, ICM 2009, Morocco*, Dec. 2009
31. M. E. A. Ibrahim, M. Rupp, and H. A. H. Fahmy, "Code transformations and SIMD impact on embedded software energy/power consumption," in *ICCES09, International Conference on Computer Engineering and Systems, Cairo, Egypt*, Dec. 2009