KHAWLA ALZOUBI, PhD

Contact information

Work Address
Qatar University, EE Dept., Al Tarfa, Doha 2713, Qatar

Cell Phone
31010315

Email
kalzoubi@qu.edu.qa

Professional Highlights

- Teaching experience of more than 7 years
- Multi-disciplinary research experience and background
- Recipient of Best Paper Award
- Awarded many scholarships and Honors
- Successful in securing funding (Co-Investigator for "Automatic Adjustment Oxygen Supplement System" project)
- Published eight academic papers in international conferences
- Excellent innovation and leadership skills

Education

Ph.D. **Case Western Reserve University, Cleveland-Ohio, USA** — Aug 2007 - Aug 2010
Computer Engineering, GPA:3.8/4.0
Dissertation title: *"Nano-Electro-Mechanical Switch (NEMS) for Ultra-Low Power Portable Embedded System Applications: Analysis, Design, Modeling, and Circuit Simulation* "
Committee Members: Professor Daniel Saab(adviser), Professor Massood Tabib-Azar(Co-Adviser), Professor Francis Merat, and Professor Michael Rabinovich

MSc **Yarmouk University, Amman/Irbid, Jordan** — July 2003 - Aug 2004
Computer Engineering/Embedded Systems, GPA: 89.5%,

BSc **Yarmouk University, Irbid-Jordan** — Sept 1996 - Jan 2002
Computer Engineering, GPA: 85.3% (ranked 1st)

Core Courses

Graduate Courses:

Nanotechnology, CMOS VLSI, CMOS Nanometer, Advanced Topics in Computer Architecture, Special Topics in Embedded Systems and Real-Time Embedded Systems: (Scheduling, Hardware-Software CO-Design, Reconfigurable Architecture), Advanced Topics in Operating System and Distributed Systems, Advanced topics in Networking, Advanced Microprocessor Course, Logic Design and Hardware Description Language (Verilog), Embedded Systems, Real-Time Embedded Systems, FPGA

Undergraduate Courses:

C++ programming language, Numerical Analysis, Digital Logic Design, 8085 Microprocessor, 8088 Processor and Interfacing, Networking, Database Management Systems, Artificial Intelligence, Control Automation(1) and (2), Image Processing, Digital Signal Processing, Systems Communication, Computer Graphics (OpenGL), Data Structures, Software Engineering, System Programming, Electronic Circuits, Electromagnetic

Scholarship/Fellowship, Grants, Honors and Awards

- Postdoctoral Fellowship, University of Waterloo,Waterloo, Canada — May 2013 – Till present
- Grand Challenges Canada, Phase I(Co-Investigator), Canada — May 2013 – Till present
- Best paper award, ISQED2011,USA — Mar 2011
- P.h.D. Fellowship, DARPA's NEMS Program, CWRU, Cleveland-Ohio ,USA — Sept 2008 - Aug 2010
- Scholarship (Ph.D.), Tafila Technical University, Tafila, Jordan — Aug 2007 - Aug 2010
- Scholarship (MSc.), Yarmouk University, Irbid, Jordan — Jul 2003 - Aug 2004
- Ranked 1st among my batch, BSc in Computer Engineering, Yarmouk University, Irbid, Jordan — Feb 2002
- Three undergraduate grants for outstanding student, and seven times on the honors list, Yarmouk University, Irbid, Jordan — Sept 1996 - Feb 2002

Teaching Experience

Lecturer, EE Department, Qatar University Augest,2015- Present

-Teaching the following course and Labs

1. Numerical Methods Course (GENG 300)
2. Digital Systems Design Lab (ELEC 262)
3. Embedded Systems Lab (ELEC 367)

Part-Time Professor, Embedded System Development(Graduate) Program *May,2015- Augest,2015*

Conestoga College, Kitchener, ON, Canada

- Teaching the following courses and labs

1. Advanced DSP course for Embedded Systems (EECE 8030)
2. Advanced DSP Lab
3. Hardware/Software Interfacing course (CNT 8000)
4. Hardware/Software Interfacing Lab using STM32F303xx Microcontroller

Assistant Professor, Electrical Eng. Dept., Tafila University (TTU),Tafila, Jordan *Jan, 2011 – Jan, 2013*

- Prepared the courses' materials and taught the following undergraduate courses:
  1. Microprocessor and Assembly Language (CE 344)
     Duration: Three semesters, Number of students: 40-65 students
  2. Data Structure and Algorithms (CE 355)
     Duration: three semesters, Number of students:14-24 students
  3. Artificial Intelligence and Expert Systems (CE 420)
     Duration: one semester, Number of students: 16 students
  4. Database Management Systems (CE 400)
     Duration: one semester, Number of students: 24 students
- Supervised undergraduate labs, such as Microprocessor lab, and Database Management lab, Circuit lab
- Supervised and monitored more than 25 students in their senior graduation projects (undergraduate level). Some of the students' graduation projects:
  1. Automatic irrigation system
  2. Wireless sensor for weather monitoring system

Teaching Assistant (TA), CWRU, Cleveland, Ohio-USA *Sept 2009 - May 2010*

- Delivered tutorials, and graded students' assignments for the following undergraduate and graduate courses:
  - Logic Control Design
  - HDL (Hardware Description Language)
  - CMOS VLSI

Full-Time Lecturer, Computer Engineering Dept., Yarmouk University, Irbid-Jordan *Sept 2004 - Aug 2007*

- Taught and participated in teaching courses for graduate students in the Embedded Systems Master Program, including:
  1. Introductory courses (C++ language, and Linux)(CE 510)
     Duration: two semesters, Number of Students: 45 -50
  2. Advanced Operating System course(CE 560)
     Duration: one semester, Number of Students: 45-50
  3. Various lab sessions for various courses, including: Verilog, FPGA, Embedded systems, Real-Time Embedded Systems, and Advanced Operating Systems course

- Taught undergraduate courses, including the following:
  1. Microprocessor and Assembly Language(CPE 344A)
     Duration: Three semesters, Number of students: 25-40
  2. Database Management System(CPE 354)
     Duration: Three semesters, Number of students: 15-25

3. Computer Interfacing(CPE 444)
   Duration: Four semesters, Number of students: 40-55
4. Numerical Analysis
   Duration: Four semesters, Number of students: 45-60
5. System Programming (CPE 466A)
   Duration: Two semesters, Number of students: 17
6. Introductory course to Computer system and Microsoft office(CS 250)
   Duration: one semester, Number of Students: 55

-Supervised various courses' labs in computer engineering department, including: Control lab, Computer Interfacing lab, C++ Programming lab, System Programming, Unix Operating System lab, Numerical Analysis lab

-Monitored more than 25 undergraduate students during their training fields (CO-OP (CPE 500)) at different locations in Amman and Irbid (cities)

-Supervised more than 30 students in their senior graduation projects. Some of the students' graduation projects(CPE 598A):

1. Web-based student election system
2. Image processing algorithm for edge detection and image enhancement
3. Computer based Radio System
4. Hardware encryption system
5. Online Doctor System
6. Implementing a 16-bit Microprocessor using hardware description language(Verilog)

Teaching Assistant, Computer Engineering Dept. Yarmouk University, Ibid-Jordan *Feb 2002 – Jul 2003*

- Taught, prepared, and assessed various undergraduate students' labs, including:

- Computer Interfacing lab
- Numerical Programming lab
- Operating System lab (under UNIX)
- System Programming lab, Microprocessor lab
- Control lab

Research Interests

Biomedical and Health Systems, Embedded Systems and Real-time Embedded Systems, Computer Architecture, VLSI Circuit Design, Near Filed-Sensing, Emerging Technologies (NEMS switches and Nanotechnology)

Research Experience

Post-Doctoral Fellow/Researcher, University of Waterloo, Waterloo, ON, Canada May 2013- Present

Adviser: Professor Omar Ramahi

- Leading the research and development of "Portable Automated Intelligent System for Continuous Oxygen Monitoring and Adjustment Oxygen Delivery for Hypoxic Patients" project

Visiting Scholar, University of Waterloo, Waterloo, ON, Canada July 2012 - Apr 2013

- Prepared, wrote, and submitted research proposals:
    - Near-Field Ground Penetrating Radar System (GPRs) for Millimetres Crack Detection in Waterproofed Concrete Bridge Decks
    - Portable Automated Intelligent System for Continuous Oxygen Monitoring and Adjustment Oxygen Delivery for Hypoxic Patients
- Secured grant funding "Stars-In-Global-Health|Grand Challenges Canada, Phase I"

RA, CWRU Fellowship, DARPA's NEMS Project, Cleveland, Ohio,USA Sept 2008 - Aug 2010

NEMS Processor and Micro-Controller Project, Advisors: Professor Daniel Saab, (CWRU University) and Professor Massood Tabib-Azar (University of Utah)

- Conducted an intensive literature review for CMOS technology trends
- Explored emerging technologies that have been investigated to overcome CMOS limitations in Nanometer regime.
- Understood NEMS switches in terms of operation modes, types, physical quantities, physical phenomena, and device characteristics.
- Designed NEMS Switches with highly attractive characteristics by adjusting the switch physical quantities: dimensions, structure, and materials; through the understanding of the device's physical phenomena, considering the fabrication limitations.

- Derived an accurate NEMS switch circuit simulation model. To derive a very accurate device model, a 3D finite-element model for the physical device is built.
- Developed a circuit simulator (Spice-like).

CWRU, Nanotechnology Course, Cleveland, Ohio, USA Fall Semester, 2008

Advisor: Professor Alexis Abramson

- Wrote NSF Proposal : "Safely implantable Nano-System for Seizure Detection and Prediction"
- Conducted a background for implantable systems applications and limitations
- Explored seizure detection and prediction techniques that have been conducted in literature

M.S Graduation Project ,Yarmouk University, Irbid-Jordan Summer Semester, 2003/2004

Adviser: Professor Farouq Alomari

- Topic: "Embedded Sync Server using SNTP Protocol and GPS":
  Designed and implemented embedded sync server. The Sync Server Software was written using C language, and constructed by implementing Simple Network Time Protocol (SNTP). And the device driver for Global Positioning Satellite system (GPSs) was written. The Sync server was designed, tested, and downloaded into embedded system kit. The GPS was connected to this kit, resulting of producing the embedded sync server

RA, Yarmouk University, Irbid,Jordan Spring Semester 2001/2002

Advisor: Professor Salem Alaqtash

Topic: Multi-Agents software for E-commerce System

BSc. Graduation Projects , Yarmouk University 2000-2001

Adviser: Professor Salem Alaqtash

- Project 1 : Programmable Logic Controller (PLC):
  Designed and built a PLC simulator using VC++ and SQL server
- Project 2: Multi-Agents Systems
  Designed and implemented multi-Agents system using VC++ and socket programming

Publications

- Khawla Alzoubi, Omar Ramahi, and Zeyad Alqraa,"Portable Automated Oxygen Administration system for Hypoxic Patient", 2015 (Submitted)
- Vijay K. Sirigir, Sijing Han, Khawla Alzoubi, Daniel G. Saab, Massood Tabib-Azar: Ultra-low-Power Ultra-fast Hybrid CNEMS-CMOS FPGA. IEEE Trans, on Circuits and Systems, Microelectronics and Solid State Electronics, 2012, http://article.sapub.org/10.5923.j.msse.20120102.05.html
- **(Best Paper Award)** Khawla Alzoubi, Daniel G. Saab, Sijing Han, Massood Tabib-Azar: Complementary Nano-Electro-Mechanical Switch for Ultra-Low-Power Applications: Design and Modeling, Proceedings 2011 12th International Symposium on Quality Electronic Design (ISQED 2011), p 8 pp., 2011. Published, 03/01/2011, http://ieeexplore.ieee.org.ezproxy.lib.utah.edu/xp...
- Tabib-Azar, M.; Venumbaka, S.R.; Alzoubi, K.; Saab, D.; , "1 volt, 1 GHz Nems Switches," Sensors, 2010 IEEE , vol., no., pp.1424-1426, 1-4 Nov. 2010. Published, 11/2010. http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arn...
- Tabib-Azar, Massood; Alzoubi, Khawla; Saab, Daniel; , "Novel MEMS 900 MHz electrostatic silicon delay line," Sensors, 2010 IEEE , vol., no., pp.205-207, 1-4 Nov. 2010. Published, 11/2010. http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arn...
- Alzoubi, K.; Saab, D.G.; Tabib-Azar, M.; "Circuit simulation for Nano-Electro-Mechanical switches VLSI circuits," Circuits and Systems (MWSCAS), 2010 53rd IEEE International Midwest Symposium on, vol., no., pp.1177-1180, 1-4 Aug. 2010. Published, 09/2010. http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arn...
- Sijing , V.K.; Alzoubi, K.; Saab, D.G.; Kocan, F.; Tabib-Azar, M.; "Ultra-low-Power Ultra-fast Hybrid CNEMS-CMOS FPGA," Field Programmable Logic and Applications (FPL), 2010 International Conference on, vol., no., pp.368-373, Aug. 31 2010-Sept. 2 2010. Published, 09/2010. http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arn...
- Khawla Alzoubi, Daniel G. Saab, and Massood Tabib-Azar, "Complementary Nano-Electro-Mechanical Switches For Ultra-Low-Power Applications: Fabrication, Design and Simulation." International Conference on IC Design & Technology May 18 – May 20, 2009, Austin, TX 78729. Published, 05/20/2009. http://www.icicdt.org/files/icicdt_2009_program_fi...
- Alzoubi, K., Saab, D. G., and Tabib-Azar, M. 2009. "Complementary Nano-Electromechanical Switches for Ultra-low Power Embedded Processors." Proceedings of the 19th ACM Great Lakes Symposium on VLSI (Boston Area, MA, USA, May 10 - 12, 2009). GLSVLSI '09. ACM, New York, NY, 309-314. Published, 05/10/2009. http://portal.acm .org/citation.cfm?doid=1531542.15...

Workshops and Training

- Programmable Logic Controller (PLC) Workshop, JUST University, Irbid, Jordan,1999
- COMSOL Multi-Physics Simulation Workshop, Mechanical Module, Cleveland, Ohio, USA, 2008
- Teaching Series Workshop, University of Waterloo, Waterloo, ON, Canada, 2013

Attended Conferences

- Entrepreneur workshop, Qatar University, Doha,2016
- Vision workshop, Qatar University, Doha, 2015
- University of Waterloo Research Partnering Event: Devices & Sensors, June 2014
- 19th ACM Great Lakes Symposium on VLSI , Boston, MA, USA, 2009 (presented)
- NATO Computer Architecture Conference, Case Western Reserve University, Cleveland-Ohio, USA, 2008
- Nano-Medicine Summit, Cleveland, Ohio, USA , 2008
- Biomedical Engineering Conference, Amman, Jordan,2006
- Sensors and Actuators workshop, University of Waterloo, Canada, 2014

Certifications

- CMOS Nanometer Technology Certification, Professor Sarwup Baunih,CWRU, Cleveland, Ohio,USA
- COMSOL Multi-Physics Certification, Cleveland, Ohio, USA, 2008
- Teaching Series Certification, University of Waterloo, Waterloo, ON, Canada, 2013

Technical Skills

Synthesis & Simulation Tools:	Synopsys, Altera Software, Mentor Graphics Tools, COMSOL, LTSpice, Eagle PCB Board Design and Layout, Labview, Simulink (Matlab)
Programming Languages:	C/ C++, Java, Pascal, HTML, Java script, MATLAB, Mathematica
Scripting Languages:	ksh, csh and bash
Hardware Description Languages:	VHDL, Verilog
Assembly Language:	MASM/TASM
Database and Operating Systems:	SQL, ASP**,** Linux, Unix, Windows, Kernel/device drivers
MCU and Development Tools:	STM32F40xxx(32-bit MCU), Keil uVersion Development Tool,AFE4490, SPBT2632C2A Bluetooth Module
Networking:	TCP/IP, Wireless Network Protocols
Microsoft Office and Professional Tools:	Word, Powerpoint, Access, Excel, Project Management, XFig, Visio

References

Omar Ramahi
Professor, ECE Department
University of Waterloo
200 University Ave. West,
Waterloo, ON
oramahi@uwaterloo.ca
519-888-4567 x37460

Prof. Ramahi is my current adviser in my postdoctoral fellowship at the University of Waterloo

Daniel G. Saab
Associate Professor
Case Western Reserve University
Cleveland OH – 44106
dgs3@case.edu
001-216- 368 2494

Prof.Saab was my academic adviser and was Supervising my PhD dissertation work at CWRU.

Massood Tabib-Azar
Director USTAR Professor
University of Utah
M.Tabib-Azar@utah.edu
001-216- 5347670

Prof. Tabib-Azar was my academic co-adviser. He was Supervising my PhD dissertation work.