

A T E F A B D R A B O U

UAE University, Electrical Engineering Department, College of Engineering,
Al-Ain, Abu Dhabi, UAE, 15551

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EDUCATION

Doctor of Philosophy, Electrical Engineering

University of Waterloo, Waterloo, Ontario, Canada 2008

Certificate in University Teaching (CUT)

University of Waterloo, Waterloo, Ontario, Canada 2008

Masters of Science, Electrical Engineering

Ain Shams University, Cairo, Egypt 2003

Bachelor of Science (honors), Electrical Engineering

Ain Shams University, Cairo, Egypt 1997

PROFESSIONAL EXPERIENCE

Assistant Professor **UAE University, Al-Ain, Abu Dhabi, UAE,** Feb. 2010 - till now

- Conducting research and teaching in the Electrical Engineering Department.

NSERC Post-doctoral Fellow **University of Toronto, Ontario, Canada** May 2009 – Jan. 2010

Conducted research on delay control and information dissemination in vehicular ad hoc networks

Post-doctoral Fellow **University of Waterloo, Ontario, Canada** Sep. 2008 - Apr. 2009

Conducted research on resource management in self-organizing wireless networks

Research Assistant **University of Waterloo, Ontario, Canada** Jan. 2004 - Aug. 2008

- Designed a location-based quality-of-service (QoS) routing protocol for ultra wideband (UWB) ad hoc networks.
- Developed two statistical models for QoS provisioning via call admission control for IEEE 802.11 saturated and non-saturated single hop ad hoc networks
- Developed a traffic-aware statistical QoS routing protocol for IEEE 802.11 multihop ad hoc networks

Software Engineer **Hewlett Packard (HP), Cairo, Egypt** Feb. 2003 - Dec. 2003

- Created test scripts for testing the network management software for Telecom Egypt network operation center (NOC)
- Conducted voice traffic analysis for the manageable part of Telecom Egypt public switched telephone network
- Wrote and performed system-level test procedures

Software Engineer **Lucent Technologies (Bell Labs), Cairo, Egypt** Jul. 2000 - Jan. 2003

- Lead a team of three software developers and developed a simple network management protocol (SNMP) manager application for continuously monitoring the status for Lucent's network components
- Designed and contributed to the implementation of a software simulator for the downlink packet control unit (PLU) for Lucent cellular base station controller.
- Developed an encoding algorithm for compressing the information elements in the over-the-air signaling messages for Lucent's cellular network base stations

Technical Support Engineer Alkan Communication, Cairo, Egypt Oct. 1998 - Jun. 2000
Participated in designing, maintaining, and commissioning of wide area network (WAN) solutions including integrated enterprise voice/data connectivity and security

TEACHING & PEDAGOGICAL ACTIVITIES

Instructional Activities

Instructor United Arab Emirates University, Al-Ain, Abu Dhabi, UAE Feb. 2010 - till now

- ELEC325 (undergrad level), Engineering Electromagnetics (**7 times**)
- ECOM432 (undergrad level), Data Communications and Networks (**8 times**)
- ECOM442 (undergrad level), Data Communications and Networks Lab (**twice**)
- ECOM360 (undergrad level), Fundamentals of Communication Systems (**8 times**)
- ELEC552 (undergrad level), Computer Networks (**once**)
- ECOM580 (undergrad level), Special Topics in Communications (**once**)
- ELEC619 (grad level), Advanced Topics in Communication Engineering (**once**)

Guest Lecturer, University of Waterloo, Waterloo, Ontario, Canada Mar., 2007

- ECE 614 (grad. Level), Communications over Fading Dispersive Channels

Guest Lecturer, University of Waterloo, Waterloo, Ontario, Canada Jul. 2007

- ECE 418 (undergrad level), Communication Networks

Instructor, National Telecommunication Institute, Cairo, Egypt Aug. 2000

- Introduction to general packet radio service (GPRS)

Course & Curricula Development

- ELEC552 (advanced course about computer networks) : Designed the course material and lecture notes from scratch (for the first time in the EE Department) based on the course catalogue. Additional state-of-the art topics have been added. Virtual lab assignments using a software simulator package have been developed. Also, an assessment set of quizzes, progress tests, midterm, and final exams have been developed.
- ECOM580: A course material about computer and network security is developed from scratch using two textbooks in addition to a full set of quizzes, progress tests, midterm and final exams. An educational software package has been introduced to students for the practical application of the course concepts.
- ELEC619 (Grad. Level): A course material about wireless networks principles is built from scratch based on textbooks, references, and research papers. Simulation-based assignments have been designed in addition to midterm and final exams.
- ECOM432: Developed a new complete set of lecture notes with more comprehensive content, examples, and new organization based on two textbooks. In addition, a set of assessment tools such as quizzes, progress tests, midterm, and final exams with various types of questions have been designed.

- ECOM442: Developed a set of introductory notes of each lab experiment and contributed to developing an additional lab experiment. Contributed to restructuring the course curriculum. Developed lab-experiment-based quizzes, midterm, and final exams.
- ECOM360: Continuous improvement of lecture material is done. Additional material and a new chapter have been added.

RESEARCH PROFILE & PUBLICATIONS

Current Research Interests

Quality-of-service (QoS) provisioning and information transfer techniques for

- Ad-hoc Wireless Networks
- Vehicular Networks
- Smart Grid Communications

My Google Scholar profile: (<http://scholar.google.ae/citations?user=1tBvEvcAAAAJ&hl=en&oi=ao>).

Journals

[J1] **A. Abdrabou** and W. Zhuang, "A position-based QoS routing scheme for UWB ad hoc networks," *IEEE Journal on Selected Areas in Communications*, vol. 24, no. 4, pp. 850-856, April 2006.

[J2] H. Jiang, W. Zhuang, X. Shen, **A. Abdrabou**, and P. Wang, "Differentiated services for wireless mesh backbone," *IEEE Communications Magazine*, vol. 44, no. 7, pp. 113-119, July 2006.

[J3] **A. Abdrabou** and W. Zhuang, "Service time approximation in IEEE 802.11 single-hop ad hoc networks," *IEEE Transactions on Wireless Communications*, vol. 7, no. 1, pp. 305-313, Jan. 2008.

[J4] **A. Abdrabou** and W. Zhuang, "Stochastic delay guarantees and statistical call admission control for IEEE 802.11 single hop ad hoc networks," *IEEE Transactions on Wireless Communications*, vol. 7, no. 10, Oct. 2008, pp. 3972-3981.

[J5] **A. Abdrabou** and W. Zhuang, "Statistical QoS-routing for multihop ad hoc networks," *IEEE Transactions on Wireless Communications*, vol. 8, no. 3, pp. 1542 - 1552, March 2009.

[J6] **A. Abdrabou** and W. Zhuang, "Probabilistic Delay Control and Road Side Unit Placement for Vehicular Ad Hoc Networks with Disrupted Connectivity," *IEEE Journal on Selected Areas in Communications*, vol. 29, no. 1, pp. 129 - 139, Jan. 2011.

[J7] H. Liang, B. Choi, **A. Abdrabou**, W. Zhuang, and X. Shen, "Decentralized economic dispatch in microgrids via heterogeneous wireless networks," *IEEE Journal on Selected Areas in Communications*, vol. 30, no. 6, pp. 1061- 1074, Jul. 2012.

[J8] H. Liang, B. J. Choi, W. Zhuang, X. Shen, and A. S. A. Awad, **A. Abdrabou***, "Multiagent coordination in microgrids via wireless networks," *IEEE Wireless Communications*, vol. 19, no. 3, pp. 14 - 22, Jun. 2012. *In this paper, the authorship in ieeexplore.org is ordered by affiliation, whereas author biographies are ordered by contributions. My biography is the second.

[J9] M. T. Islam, M. M. Akon, **A. Abdrabou** and X. Shen, "Modeling Epidemic Data Diffusion for Wireless Mobile Networks", *Wireless Communications and Mobile Computing (Wiley)*, doi: 10.1002/wcm.2233, May 2012.

[J10]. M. Ismail, **A. Abdrabou**, and W. Zhuang, "Cooperative decentralized resource allocation in heterogeneous wireless access medium," *IEEE Transactions on Wireless Communications*, vol. 12, no. 2, pp. 714 - 724, Feb. 2013.

[J11]. **A. Abdrabou** and A. M. Gaouda, "Uninterrupted Wireless Data Transfer for Smart Grids in the Presence of High Power Transients," *IEEE Systems Journal*, accepted, in press, vol. PP, no. 99, Jun. 2013.

[J12]. H. Omar, W. Zhuang, **A. Abdrabou**, and L. Li, "Performance evaluation of VeMAC supporting safety applications in vehicular networks," *IEEE Transactions on Emerging Topics in Computing*, vol. 1, no. 1, pp. 69 - 83, Jun. 2013.

[J13]. **A. Abdrabou**, B. Liang, and W. Zhuang, "Delay analysis for sparse vehicular sensor networks with reliability considerations," *IEEE Transactions on Wireless Communications*, vol. 12, no.9, pp. 4402 - 4413, Sep. 2013.

[J14]. T. Khalifa, **A. Abdrabou**, S. Naik, M. Alsabaan, A. Nayak, and N. Goel, "Split- and Aggregated-Transmission Control Protocol (SA-TCP) for Smart Power Grid" *IEEE Transactions on Smart Grid*, vol. 5, no. 1, pp. 381-391, Jan. 2014.

[J15]. **A. Abdrabou**, "A wireless network architecture for smart grid distribution networks," *IEEE Systems Journal*, accepted, in press, vol. PP, no. 99, 2014.

[J16]. T. Khalifa, **A. Abdrabou**, K. Shaban, M. Alsabaan, S. Naik, "Transport Layer Performance Analysis and Optimization for Smart Metering Infrastructure," *Elsevier Journal of Networks and Computer Applications*, accepted, in press, vol. 46, pp. 83 - 93, Nov. 2014.

Conference Proceedings

[C1] **A. Abdrabou** and W. Zhuang, "A position-based QoS routing scheme for UWB ad-hoc networks", *Proc. IEEE ICC'06*, Jun. 2006.

[C2] **A. Abdrabou** and W. Zhuang, "Service time approximation in IEEE 802.11 single-hop ad Hoc networks," *Proc. IEEE INFOCOM'07*, May 2007.

[C3] **A. Abdrabou** and W. Zhuang, "A link-layer channel model for IEEE 802.11 single-hop ad hoc networks," *Proc. IEEE Globecom'07*, Nov. 2007.

- [C4] **A. Abdrabou** and W. Zhuang, "Statistical call admission control for IEEE 802.11 wireless multihop ad hoc networks," *Proc. IEEE Globecom'08*, Dec. 2008.
- [C5] T. AbdelKader, **A. Abdrabou**, and W. Zhuang, "QoS routing and link scheduling in wireless mesh backbone," *Proc. IEEE Chinacom'08*, Aug. 2008.
- [C6] **A. Abdrabou** and W. Zhuang, "On a stochastic delay bound for disrupted vehicle-to-infrastructure communication with random traffic," to appear *Proc. IEEE Globecom'09*, Nov. 2009.
- [C7] H.T. Cheng, **A. Abdrabou**, and W. Zhuang, "Novel resource management with effective frequency reuse for end-to-end QoS support in wireless mesh networks," *Proc. IEEE WCNC'10*, Apr. 2010 (received the best paper award).
- [C8] **A. Abdrabou**, B. Liang, and W. Zhuang, "Delay analysis for a reliable message delivery in sparse vehicular ad hoc networks," *Proc. IEEE Globecom'10*, Dec. 2010.
- [C9] **A. Abdrabou** and W. Zhuang, "Statistical QoS evaluation for cognitive radio networks," *Proc. IEEE Globecom'11*, Dec. 2011.
- [C10] Mohammad Islam, Murslain Akon, **Atef Abdrabou**, and Xuemin Shen, "Modeling Epidemic Data Diffusion for Wireless Mobile Networks", *Proc. IEEE Globecom'11*, Dec 2011.
- [C11] T. Khalifa, **A. Abdrabou**, K. Naik, M. Alsabaan, A. Nayak, and N. Goel, "Design and analysis of split- and aggregated-transport control protocol (SA-TCP) for smart metering infrastructure," *Proc. IEEE SmartGridComm'12*, 2012.
- [C12] H. Liang, **A. Abdrabou**, and W. Zhuang, "Stochastic Information Management for Voltage Regulation in Smart Distribution Systems," *Proc. IEEE INFOCOM'14*, 2014.

Research Grants

- The research project "Enabling Self-Healing for Smart Grids with Renewable Energy and Storage Resources" is awarded by Qatar National Research Fund (QNRF). The grant amount is **1 Million US Dollars** (\$1,049,643.60) for a period of 3 years in collaboration with Qatar University, University of Waterloo, and Kharama Co. as industrial partner. My role is a principle investigator (PI). The research project has been officially started in 20th Dec. 2013.
- The research project "Using Wireless Cooperative Networking in Future UAE Smart Grid Communications" was awarded **30,000 AED** seed research grant for the period of one year. My role is a PI.
- The research project "Efficient Data Dissemination for Future UAE Smart Grids Using Zigbee and/or WiFi Wireless Sensor and Actor Networks" was awarded a **30,000 AED (1 US\$ = 3.67 AED)** seed research grant for the period of one year. My role is a PI.

AWARDS AND SCHOLARSHIPS

- **Natural Sciences and Engineering Research Council of Canada (NSERC) Postdoctoral Fellowship (PDF 2009)**
Given for academic excellence, research potential, communication, interpersonal and leadership abilities, amount 40,000\$ CDN (per year for two years)
- **NSERC Industrial Research and Development Fellowship (IRDF 2008)** (declined)
- **Visiting Fellowship in Canadian Government Laboratories (2008)** (declined)
- **Ontario Research & Development Challenge Fund Bell Scholarship** May 2007- Apr. 2008
Given for academic excellence, amount 18,000\$ CDN
- **University of Waterloo Faculty of Engineering (FOE) Award (twice)** Sep. 2004, May 2006
Given for excellent academic achievements throughout a work term, amount 2,000 \$CDN
- **OGSST (Ontario Graduate Scholarships in Science and Technology)** May 2005- Aug. 2005
Given for academic excellence, amount 15,000\$ CDN
- **Ain Shams University Undergraduate Excellence Award (4 times)** Mar .1993 - Mar. 1996
Given for academic excellence

ACADEMIC SERVICE & OTHER SCHOLARY ACTIVITIES

University and Community Service

- Served as an organizing committee member for Electrical Engineering Alumni Day (May 2011).
- Served as the EE Department Council Secretary for academic year (AY) 2012-2013 and AY 2013-2014.
- Participated as a member of the organizing committee of the 2nd Engineering Student Renewable Energy Competition 2011.
- Serving as a Research & Special Projects Lab Coordinator starting from AY 2013-2014.
- Served as a member of the Curriculum Committee for AY 2012-2013 and AY 2013-2014.
- Served as a member of the Teaching Load committee for AY 2012-2013 and AY 2013-2014.
- Serving as a member of the College of Engineering Travel committee starting from AY 2013-2014 (Fall 2013).
- Participated in freshman students' orientation university-wide level (Colleges' Exhibition Fall 2013) and also for the College of Engineering freshman students exhibition (Spring 2014).
- Serving as an academic advisor for the 2010 cohort of Electrical Engineering female students.
- Served as an industrial training (internship) advisor for 5 consecutive semesters (from Fall 2010 up to Fall 2013).
- Served as an industrial training (internship) member of examination committee for 9 consecutive semesters starting from Spring 2010.
- Served as a graduation project examination committee member for 9 consecutive semesters (from Spring 2010 up to Spring 2014). Participated in 3 exams on average in each semester.
- Participated as an examination committee member for PhD written and oral qualifying exams for two PhD students.

- Contributed as a member of the MSc thesis defense committees of two graduate students.
- Contributed to reviewing an internal interdisciplinary research grant proposal.
- Participated in the initial screening of the applicants' CVs of a faculty member position.
- Served twice as a coordinator for capstone graduation projects in the College of Engineering for 14 students each time.
- Served as a member of the editorial committee for Emirates Journal of Engineering Research.

Service to the Profession

Associate Editor Journal of Circuits, Systems, and Computers of the World Scientific Publishing company (<http://www.worldscientific.com/worldscinet/jcsc>) since April 2013.

Moderation Assistant IEEE Engineering E-prints (Engine) for Vehicular Technology Society (VTS) Fall 2009 – Spring 2011

- Provided guidance to authors in preparing their on-line journal manuscripts , and supported their troubleshooting requests
- Contributed in the initial testing of the system editorial process

Session Chair

- Chaired the session “Performance Analysis of MANETs-II” in IEEE International Communication Conference (ICC’06), 2006
- Chaired the session “Modeling of Ad Hoc Networks” in IEEE Global Telecommunications Conference (Globecom) 2007.

Technical Program Committee (TPC) Member

- Served as a TPC member for the IEEE Globecom 2007 and 2008.
- Served as a TPC member (9 Oct. 2010 – 1 Nov. 2010) for 2011 IEEE GCC Conference & Exhibition.
- Served as a TPC member in “Ad Hoc and Sensor Network” track of IEEE Vehicular Telecommunication Conference (VTC) 2010 (Apr. 2010-May 2010) and IEEE VTC 2011 (Apr. 2011-May 2011).
- Served as a TPC member in “Wireless Applications and Services” track of the IEEE VTC 2012 (Apr. 2011-May 2011).
- Served as a TPC member in “Mobile Networks, Applications and Services” track of the IEEE Vehicular Telecommunication Conference (VTC) 2013 (Apr. 2010-May 2010).
- Served as a TPC member in “Cognitive Radio Networks” symposium Fall 2011 and Fall 2012 of the IEEE International Communication Conference ICC 2012 and ICC 2013, respectively.
- Served as a TPC member (Fall 2013) in “Mobile and Wireless Networking” symposium of the IEEE International Communication Conference ICC 2014.

Technical Reviewer

Served as a technical reviewer for:

- IEEE Journal on Selected Areas in Communications
- IEEE Transactions on Wireless Communications
- IEEE Transactions on Communications
- IEEE Transactions on Vehicular Technologies
- IEEE Transactions on Mobile Computing
- IEEE Transactions on Parallel and Distributed Processing

- IEEE Transactions on Cloud Computing
- IEEE Systems Journal
- Springer Wireless Networks Journal
- Wiley Wireless Communications and Mobile Computing
- Elsevier Applied Soft Computing Journal
- EURASIP Journal on Wireless Communications and Networking
- International Journal of Parallel, Emergent and Distributed Systems
- IEEE GLOBECOM (2005, 2006, 2007, 2008, 2009, 2011)
- IEEE ICC (2006, 2007, 2012, 2013)
- IEEE WCNC (2007, 2008)
- IEEE IWCMC (2006)
- IEEE VTC (2006, 2010, 2011)
- IEEE ICCCN 2008
- IEEE PIMRC 2008
- IEEE SmartGridComm 2012

Editorial Board Member

Serving as an Editorial Board Member for

- ICTACT Journal on Communication Technology (<http://www.ictact.in>).
- Wireless Engineering and Technology (WET) journal (<http://www.scirp.org/journal/wet/>).
- Walailak Journal of Science and Technology (<http://wjst.wu.ac.th/>).

Invited Talks

- “Wireless Sensor Applications in Smart Grids”, Dubai Electricity and Water Authority (DEWA) Scientific Week, Sep. 2013.
- “Sensor Networks on the Road: Delay Analysis for a Reliable Message Delivery in Sparse Vehicular Networks”, University of Toronto, Electrical & Computer Engineering Department, Networking Seminar Series, July 2010.

TRAINING

Certificate in University Teaching (CUT) University of Waterloo, Ontario, Canada 2006-2009

The certificate mandates the attendance of a series of workshops about teaching in higher education and writing a graded application-based response paper about each one of them. Also, it requires the successful completion of a research project about teaching styles in engineering education, a teaching dossier, and performing successfully a teaching practicum of teaching events monitored by a trained teaching observer.

Computer Networks Diploma Information Technology Institute (iT_i), Cairo, Egypt 1997-1998

A series of intensive courses on computer networking, data communications, LAN concepts, WAN concepts, SNA, TCP/IP concepts & implementation, C programming, C++ programming, Windows programming, TCP/IP socket programming under Unix using standard C language, Unix shell scripting, Unix administration, Java script, and HTML programming