Ahmed Bedewy

CONTACT INFORMATION

mobile: +1 614-477-7613

Address: 670 Cuyahoga CT.
Columbus, OH 43210

E-mail: bedewy.2@alexu.edu.eg

RESEARCH INTERESTS

- Data Freshness Optimization, Wireless Communications, Cognitive Radios, Information Theory,

EDUCATION

Ohio State University (OSU), USA **August 2015 - current**

Ph.D. student in Electrical Engineering

Advisor: Prof. Ness Shroff, Dr. Yin Sun

Alexandria University, Egypt **September 2011 - January 2015**

M.Sc. in Electrical Engineering

Advisor: Prof. Karim G. Seddik
Thesis: Cognitive MAC Design with Cooperation and Energy Harvesting

Alexandria University, Egypt **September 2006 - July 2011**

B.Sc. in Electrical Engineering

Overall grade: Distinction with Degree of Honor (grade: 93.59%, GPA:3.96).
Rank (out of 443): $\mathbf{1^{st}}$.
Thesis: Baseband Implementation of LTE Advanced Downlink Physical Layer.

HONORS AND AWARDS

- Student Travel Grant to attend IEEE ISIT, 2016.
- Ranked $\mathbf{1^{st}}$ over Electrical Engineering Class of 2011, Alexandria University.
- Awarded the Prof. Abdelsamie Mustafa prize for the $\mathbf{1^{st}}$ student over Electrical Engineering Class of the Faculty of Engineering, Alexandria University in 2011.
- Graduation project fund winner, National Telecommunications Regulatory Authority - NTRA, 2011.
- Awarded Certificate of Merit, First Class Honors, for being one of the top ten students ($\mathbf{1^{st}}$ at last three years) in Electrical Engineering during my undergraduate studies (2006-2011).
- Ranked $\mathbf{1^{st}}$ on El Abassia Secondary School (Maths Dep.) upon high school graduation (99.02%).

RESEARCH EXPERIENCE

The Ohio State University (OSU), Ohio, USA

Advisor: Prof. Ness Shroff, Dr. Yin Sun

Graduate Research Assistant **August 2015 – current**

- We study date freshness optimization in information update networks. An important metric of data freshness is "Age-of information" which is defined as the time elapsed since the freshest packet was generated.
- We design low complexity scheduling policies that can achieve age-optimality or near age-optimality in general system setting including arbitrary arrival process. The optimality of these polices are proven in stochastic ordering sense.
- We investigate the age-optimality for single hop multi-server queueing networks and multihop networks.

The American University in Cairo (AUC), Cairo, Egypt

Advisor: Prof. Ayman Y. Elezabi, Prof. Karim G. Seddik

Research Assistant **August 2012 – August 2013**

- Studying a cognitive radio network in which a secondary user (SU) exploits the primary user (PU) feedback from a queuing theory point of view where the secondary user accesses the

channel with different access probabilities.

- Determining the access probabilities so that the SU throughput is maximized under two PU's QoS (Quality of Service)constraints: the PU queue stability and a limit on the average PU packet delay, considering interference-based communication model.

Faculty of Engineering Alexandria University, Alexandria, Egypt

Advisor: Prof. Karim G. Seddik, Prof. Amr A. El-Sherif, Prof. Tamer Elbatt

Research Assistant **September 2011 - January 2015**

- Studying the queues stability in a random access network in which the nodes have finite energy sources. The nodes leverage the feedback information for collision resolution.
- Identifying the loss occurred in the stability region of the proposed system due to the energy limitation.
- Studying the queues stability and delay in cooperative multiple access for cognitive radio systems in which the SU has finite energy sources.
- A PU packet is admitted to the relay queue with an admission probability. Moreover, the SU serves either the queue of its own data or the queue of the PU relayed data with certain service probabilities.
- Comparing obtained stability region and the average packet delay with the stability region and the average packet delay of the system without energy constraints, and the losses due to finite energy are identified.

Under Preparation Journals

"Minimizing the Age of the Information through Queues", *in preparation for submission to IEEE Transactions on Wireless Communications.*

Conference Papers

Ahmed M. Bedewy, Yin Sun, and Ness B. Shroff, "Age-Optimal Information Updates in Multihop Networks", *IEEE ISIT*, 2016.

Ahmed M. Bedewy, Yin Sun, and Ness B. Shroff, "7Optimizing Data Freshness, Throughput, and Delay in Multi-Server Information-Update Systems", *IEEE ISIT*, 2016.

Ahmed M. Bedewy, Amr A. El-Sherif, Karim G. Seddik and Tamer ElBatt, "Cooperative MAC for Cognitive Radio Network with Energy Harvesting and Randomized Service Policy", *IEEE Globecom* (GC Wkshps), 2015.

Ahmed M. Bedewy, Karim G. Seddik and Amr A. El-Sherif, "On the Stability of Random Access with Energy Harvesting and Collision Resolution", *IEEE GLOBECOM*, 2014.

Ahmed M. Bedewy, Karim G. Seddik and Ayman Y. Elezabi, "A Feedback-based Access Scheme for Cognitive Radio Networks Over Interference Channels with Primary Queue Guarantees", *IEEE WiOpt*, 2013.

Teaching Experience

Alexandria University, Alexandria, Egypt

Teaching Assistant/Demonstrator **Fall 2011 – Spring 2015**

Courses:

- Digital Communications
- Analog Communications
- Communications Systems
- Signals and systems
- Microprocessor 8086
- Optical Devices
- Very-large-scale integration (VLSI)

Responsibilities:

- Tutoring
- Lab supervision
- Preparing and Discussing Matlab, Assembly and C programming assignments
- Marking exams and quizzes
- Monitoring examiners

ADVANCED & COURSES

Computer Communication Networks, Stochastic Process Detection & Estimation, Information Theory, Real Analysis, Probability Theory, Network Optimization & Algorithms.

SKILLS & BACKGROUND

Software Languages: *8086 Assembly, Matlab and LaTeX.*

Wireless Standards: GSM, GPRS, UMTS, LTE and LTE-A.

WORKING EXPERIENCE

The Academy of Air Defense, Alexandria, Egypt
Lab Supervision: Supervision of the establishment of a Microwave Measurements Lab **Sep 2014**

EXTRA CURRICULUM ACTIVITIES

Attended *ISIT* 2016 conference in Barcelona, Spain as an author and presenter.
Attended *WiOpt* 2013 conference in Tsukuba City, Japan as an author and presenter.
Won the **Bronze medal** in the Egyptian Olympic Fencing Championship (Individuals), 2004
Won the **Gold medal** in the Egyptian Olympic Fencing Championship (Teams), 2004

REFERENCES

Prof. Ness B. Shroff
Chaired Professor of ECE and CSE
The Ohio State University
Ohio, USA
Email: shroff.11@osu.edu

Dr. Yin Sun
Research Associate in ECE
The Ohio State University
Ohio, USA
Email: sunyin02@gmail.com

Prof. Karim G. Seddik
Assistnt Professor
American University in Cairo
Cairo, Egypt
Email: kseddik@aucegypt.edu