Ahmed Bedewy

ahmedbedewy.github.io/osu-bedewy/

Contact Information

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Research Interests

o Age-of-Information Optimization, Wireless Communications, Cognitive Radios

Education

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

Ph.D. student in Electrical Engineering

Advisors: Prof. Ness Shroff, Prof. Yin Sun

Alexandria University, Alexandria, 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, Alexandria, 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): 1st.

Thesis: Baseband Implementation of LTE Advanced Downlink Physical Layer.

Honors and Awards

o Student Travel Grant to attend IEEE ISIT, 2017

o Student Travel Grant to attend IEEE ISIT, 2016

o Ranked 1st over Electrical Engineering Class of 2011, Alexandria University

o Awarded the Prof. Abdelsamie Mustafa prize for the 1st student over Electrical Engineering Class of the Faculty of Engineering, Alexandria University in 2011

o Graduation project fund winner, National Telecommunications Regulatory Authority - NTRA, 2011

o Awarded Certificate of Merit, First Class Honors, for being one of the top ten undergraduate students during 2006-2008 and 1st during 2008-2011 in Electrical Engineering

o Ranked 1st on El Abassia Secondary School (Maths Dep.) upon high school graduation (99.02%)

Research Experience

The Ohio State University (OSU), Columbus, OH, USA

Advisors: Prof. Ness Shroff, Prof. Yin Sun

Graduate Research Assistant   **August 2015 – current**

- We study data 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 multi-channel and multihop networks.

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

Advisors: 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.

Alexandria University, Alexandria, Egypt

Advisors: 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.
- Studying the queues stability and delay in cooperative multiple access for cognitive radio systems in which the SU has finite energy sources.
- Comparing obtained stability region and the average packet delay with those of the systems without energy constraints, and identifying the losses due to finite energy.

Under Preparation Journals

o **Ahmed M. Bedewy**, Yin Sun, and Ness B. Shroff, "The Age of Information in Multihop Networks", *to be submitted to IEEE Transactions on Information Theory*, 2017: [Link]

Submitted Journals

o **Ahmed M. Bedewy**, Yin Sun, and Ness B. Shroff, "Minimizing the Age of the Information through Queues", *submitted to IEEE Transactions on Information Theory*, 2017: [Link]

Conference Papers

o **Ahmed M. Bedewy**, Yin Sun, and Ness B. Shroff, "Age-Optimal Information Updates in Multihop Networks", *IEEE ISIT*, 2017: [Link]
o **Ahmed M. Bedewy**, Yin Sun, and Ness B. Shroff, "Optimizing Data Freshness, Throughput, and Delay in Multi-Server Information-Update Systems", *IEEE ISIT*, 2016: [Link]
o **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: [Link]
o **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: [Link]
o **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: [Link]

Technical Reviews

IEEE Transactions on Wireless Communications, IEEE Transactions on Information Theory, IEEE ISIT

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:
o Tutoring
o Lab supervision
o Preparing and Discussing Matlab, Assembly and C programming assignments
o Marking exams and quizzes

Graduate 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

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   **Prof. Yin Sun**
Ohio Eminent Scholar in Networking and Communications   Assistant Professor in ECE
Chaired Professor of ECE and CSE   Auburn University
The Ohio State University   Auburn, AL, USA
Columbus, OH, USA   *Email:* yzs0078@auburn.edu
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