

Salma EMARA

PERSONAL INFORMATION

NATIONALITY Egyptian
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EDUCATION

SEPT 2018 - DEC 2022 Doctor of Philosophy (PhD) in
ELECTRICAL AND COMPUTER ENGINEERING (ECE),
University of Toronto (UofT), Canada
Supervisor: Professor Baochun Li

FEB 2014 - JUN 2018 Bachelor of Science (BSc) in
ELECTRONICS AND COMMUNICATIONS ENGINEERING,
The American University in Cairo (AUC), Egypt
GPA: 4.0/4.0
Thesis Supervisor: Professor Hassanein Amer

TEACHING EXPERIENCE

JAN 2022 - <i>Present</i>	Course Instructor, UofT APS 105 <i>Computer Fundamentals</i> (in C programming language) Instruct lectures Design labs, tutorials, midterm and final exam Hold office hours Click to view online or in-person sample lecture
JAN 2019 - DEC 2021 Winter 2019 – 2021 (3 semesters)	Graduate Teaching Assistant, UofT APS 105 <i>Computer Fundamentals</i> (in C programming language) Teach weekly tutorial sessions Help and grade students during their weekly lab sessions Mark midterm and final exam Click for recorded tutorials of Winter 2021
Fall 2019 – 2021 (3 semesters)	ECE 244 <i>Computer Fundamentals</i> (in C++ programming language) Teach weekly tutorial sessions Mark final exam Click for recorded tutorials of Fall 2020
2015 – 2018 Fall 2015 - Spring 2016	Undergraduate Teaching Assistant, AUC ECE 210 <i>Digital Logic Design</i> Hold revision and problem solving sessions
Fall 2017 & Spring 2018	ECE 435 <i>Microcontroller System Design</i> Hold revision and problem solving sessions

MENTORING

SEPT 2019 – AUG 2020	Fei Wang Visiting researcher at UofT Research topic “Online Reinforcement Learning for Congestion Control”
APR 2020 – AUG 2020	Isidor Kaplan Summer Research Intern at UofT Research topic “Reinforcement Learning for Adaptive Streaming Codes”
SEPT 2019 – JUN 2020	Zining Yin Master of Engineering student at the UofT Thesis titled “Reinforcement Learning to Refine Congestion Control”
SEPT 2019 – APR 2020	Tianyang Liao Undergraduate student at the UofT Thesis titled “Refine Congestion Control Using PCC Expert”
SEPT 2019 – APR 2020	Denzyl Layne Undergraduate student at the UofT Thesis titled “Deep Q-Learning to Refine Congestion Control”

HONORS AND AWARDS

SEPT 2018 – <i>Present</i>	ECE Fellowship, UofT
MAY 2022	ECE Departmental Teaching Award for Winter 2022, UofT
MAY 2022	ECE Departmental Teaching Assistant Award for Fall 2021, UofT
MAR 2022	Shortlisted for TATP TA Teaching Excellence Award, UofT
SEPT 2018 – AUG 2019	Vector Scholarship in Artificial Intelligence (VSAI)
JUN 2018	President Cup, AUC
JUN 2018	Mohamed El Beleidy Academic Award, AUC
2015 – 2018	Academic Achievement Scholarship, AUC
2015 – 2018	Highest GPA, School of Sciences and Engineering, AUC
SEPT 2017 – SEPT 2019	Certified LabVIEW Associate Developer (CLAD)
JUN 2012	Top in the world in Physics, IGCSE Examinations

RESEARCH EXPERIENCE

SEPT 2018 – <i>Present</i>	Research Assistant, UofT under the supervision of Professor Baochun Li
2014 – 2016	Undergraduate Research Assistant, AUC under the supervision of Professor Nageh Allam Water splitting using TiO ₂ nanotubes sputtered with Au nano particles

PUBLICATIONS (*in reverse chronological order*)

- [7] **Salma Emara**, Fei Wang, Baochun Li, Timothy Zeyl, “*Pareto: Fair Congestion Control with Online Reinforcement Learning*,” in IEEE Transactions on Network Science and Engineering, 2022.
- [6] **Salma Emara**, Fei Wang, Isidor Kaplan, Baochun Li, “*Ivory: Learning Network Adaptive Streaming Codes*,” in the Proceedings of the 29th IEEE/ACM International Symposium on Quality of Service (IWQoS), 2022 (*acceptance rate*: 24.3 %).
- [5] **Salma Emara**, Silas Fong, Baochun Li, Ashish Khisti, Wai-Tian Tan, Xiaoping Zhu, John Apostolopoulos, “*Low-Latency Network-Adaptive Error Control for Interactive Stream-*

ing,” IEEE Transactions on Multimedia, vol. 24, pp. 1691 - 1706, 2022.

- [4] Nada Atef, **Salma Emara**, Dina S. Eissa, Ahmed El-Sayed, Omar A. M. Abdelraouf, Nageh K. Allam. “*Well-dispersed Au nanoparticles prepared via magnetron sputtering on TiO₂ nanotubes with unprecedentedly high activity for water splitting*,” Electrochem. Sci. Adv. 2020; e2000004.
- [3] **Salma Emara**, Baochun Li, Yanjiao Chen, “*Eagle: Refining Congestion Control by Learning from the Experts*,” in the Proceedings of IEEE INFOCOM 2020 (*acceptance rate: 19.8 %*).
- [2] Silas L. Fong, **Salma Emara**, Baochun Li, Ashish Khisti, Wai-Tian Tan, Xiaoqing Zhu, John Apostolopoulos, “*Low-Latency Network-Adaptive Error Control for Interactive Streaming*,” in Proceedings of the 27th ACM International Conference on Multimedia (MM '19), October 21–25, 2019, Nice (*acceptance rate: 26.5 %*).
- [1] **Salma Emara**, Ayah Elewa, Omar Wasil, Kholoud Mostafa, Nada Abdelkhalak, Ahmed H. Soliman, Hassan Halawa, Malak ElSalamouny, Ramez Daoud, Hassanein Amer, “*Heterogenous ITS Architecture for Manned and Unmanned Cars in Suburban Areas*,” in the Proceedings of the IEEE 23rd International Conference on Emerging Technologies and Factory Automation (ETFA), Torino, Italy, September 2018.

ACADEMIC PROJECTS

MACHINE LEARNING	Use Tensorflow to train supervised learning models using linear and logistic regression and Deep Neural Networks on MNIST dataset
	Use Pytorch to train deep reinforcement learning algorithms for Atari games
COMMUNICATIONS	Compare between 1G and 2G cellular networks in terms of their trunking efficiencies using MATLAB
	Build MATLAB codes that simulate FM, 16-QAM, Binary and M-ary FSK, PSK and ASK modulation and demodulation and channel coding like linear block codes and convolutional codes
	Generate and cancel echoes using MATLAB
SMART SYSTEMS	Design a smart city of interconnected manned and autonomous vehicles to reduce latency of the network using RIVERBED
	Design a micro-controller based smart office & a robot that gets out of a maze using Arduino
PROGRAMMING	Build C++ code to make computer games using SFML, simulators of RISC-V disassembler and cache memories and measure the speed and power of a WiFi connection
DIGITAL SYSTEMS	Design a 4-bit synchronous counter using VHDL/Verilog
	Design a 4-bit ALU using Cadence
TRAFFIC CONTROL	Develop packet schedulers and shapers such as Token Bucket, Weighted Fair Queuing, Hierarchical Token Bucket and Priority Schedulers using Java and TC in linux kernel

WORK EXPERIENCE

JUL – AUG 2017	Applications Engineer Intern, National Instruments (NI), Cairo, Egypt Learn programming in LabVIEW Migrate code to a working demo code to transmit and receive RF signals using PXIe and USRP RIO
JAN 2017	IT Intern, King AbdelAziz University and Hospital (KAUH) Work with technical support team to solve software and hardware problems

COMPUTER SKILLS

OS	LINUX, WINDOWS, MAC
MS OFFICE	Excel, Word, PowerPoint
MAC	Numbers, Keynote, iMovie
PROGRAMMING LANGUAGES	Python (with Tensorflow & Pytorch), C++, C, JAVA, MATLAB, Arduino IDE, MIPS Assembly, \LaTeX
COMPUTER SOFTWARE	RIVERBED MODELER, Multisim, LabVIEW, Cadence

LANGUAGES

ENGLISH	Fluent
ARABIC	Native