Eman Ramadan

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Summary of Qualifications

- PhD in Computer Science
- 5+ years research experience in several areas such as: 5G Mobile Networking, Resilient Routing, Measurement Studies, Applied Machine Learning, Adaptive (Volumetric) Video Streaming, Content Distribution Networks (CDN), Software Defined Networks (SDN)
- Publications in SIGCOMM, CoNext, IMC, SOSR, PAM, WWW, SIGCOMM Workshops (NAI, 5G-MeMU), ICDCS, INFOCOM, IFIP
- Managing and analyzing gigabytes of 5G research data
- Led & co-led several research projects with 5-10 students. Mentored several Ph.D., M.Sc., and undergrad students towards publishing their first research papers.
- Obtained industry experience through an engineering internship at Google

Work Experience

University of Minnesota — Minneapolis, MN
Lecturer and Research Associate — January 2023 - Present

Responsibilities:
- Teaching Undergraduate and Graduate courses.
- Lead, supervise, and conduct research in 5G network measurements, autonomous vehicles, and 5G/NextG network designs and experimentation
- Write research manuscripts, developing presentations, and participate in grant proposal preparation and writing
- Mentor graduate and undergraduate students working in the Networking and Mobile Systems Research lab

Education

Ph.D. Computer Science — 2022
- University of Minnesota, Twin Cities — Minneapolis, MN
  - Research Area: Networking
  - Thesis: Enhancing the Performance of Mobile Video Streaming Ecosystems
  - Adviser: Zhi-Li Zhang
  - GPA: 3.85/4.0

M.Sc. Computer Science — 2014
- University of Minnesota, Twin Cities — Minneapolis, MN
  - GPA: 3.85/4.0

M.Sc. Computer Engineering — 2012
- Alexandria University — Alexandria, Egypt
  - Thesis: Energy Aware Overlapping Multi-hop Clustering for Wireless Sensor Networks
  - Adviser: Moustafa Youssef
  - GPA: 3.95/4.0

B.Sc. Computer Engineering — 2008
- Alexandria University — Alexandria, Egypt
  - Graduation Project: Egypt Toll Roads (Electronic Toll Collection with RFID)
  - GPA: 3.91/4.0 (Distinction with Degree of Honor, Ranked 4th)

Funding

[1] Co-PI - NSF Award 2323174: IMR: MT: xGTracker – Mobile xG Performance Monitoring and Data Collection Platform to Enable Large-Scale Crowd-Sourced Measurement. PI: Zhuoqing Mao Co-PIs: **Eman Ramadan**, Feng Qian $550,000, 11/01/2023-10/31/2025.

Patents

[1] Using User-side Contextual Factors to Predict Cellular Radio Throughput. Arvind Narayanan, **Eman Ramadan**, Feng Qian, and Zhi-Li Zhang (Provisional patent filed).

Publications

[1] Rostand A. K. Fezeu, Claudio Fiandrino, **Eman Ramadan**, Jason Carpenter, Lilian Coelho de Freitas, Faaiq Bilal, Wei Ye, Joerg Widmer, Feng Qian, Zhi-Li Zhang. "Unveiling the 5G Mid-Band Landscape: From Network Deployment to Performance and Application QoE". In Proceedings of the ACM SIGCOMM, August 2024.

[2] Wei Ye, Xinyue Hu, Steven Sleder, Anlan Zhang, Udhaya Kumar Dayalan, Ahmad Hassan, Rostand A. K. Fezeu, Akshay Jajoo, Myungjin Lee, **Eman Ramadan**, Feng Qian, Zhi-Li Zhang. "Dissecting Carrier

Aggregation in 5G Networks: Measurement, QoE Implications and Prediction". In Proceedings of the ACM SIGCOMM, August 2024.

[3] Rostand A. K. Fezeu, Claudio Fiandrino, **Eman Ramadan**, Jason Carpenter, Daqing Chen, Yiling Tan, Feng Qian, Joerg Widmer, and Zhi-Li Zhang. "Roaming across the European Union in the 5G Era: Performance, Challenges, and Opportunities". In Proceedings of IEEE INFOCOM, May 2024.

[4] Rostand A. K. Fezeu, **Eman Ramadan**, Wei Ye, Benjamin Minneci, Jack Xie, Arvind Narayanan, Ahmad Hassan, Feng Qian, Zhi-Li Zhang, Jaideep Chandrashekar, and Myungjin Lee. "An In-Depth Measurement Analysis of 5G mmWave PHY Latency and Its Impact on End-to-End Delay". In Proceedings of the Passive and Active Measurement: 24th International Conference (PAM), March 2023.

[5] Xinyue Hu, **Eman Ramadan**, Wei Ye, Feng Tian, and Zhi-Li Zhang. "Raven: Belady-Guided, Predictive (deep) Learning for In-memory and Content Caching". In Proceedings of the 18th International Conference on emerging Networking EXperiments and Technologies, (CoNEXT), December 2022.

[6] **Eman Ramadan**, Hesham Mekky, Cheng Jin, Braulio Dumba, and Zhi-Li Zhang. "Taproot: Resilient Diversity Routing with Bounded Latency". In Proceedings of the ACM SIGCOMM Symposium on SDN Research (SOSR), September 2021.

[7] **Eman Ramadan**, Arvind Narayanan, Udhaya Kumar Dayalan, Rostand A. K. Fezeu, Feng Qian, and Zhi-Li Zhang. "Case for 5G-Aware Video Streaming Applications". In Proceedings of the ACM SIGCOMM 1st Workshop on 5G Measurements, Modeling, and Use Cases (5G-MeMU), August 2021.

[8] Zhi-Li Zhang, Udhaya Kumar Dayalan, **Eman Ramadan**, and Timothy J. Salo. "Towards a Software-Defined, Fine-Grained QoS Framework for 5G and Beyond Networks". In Proceedings of the ACM SIGCOMM Workshop on Network-Application Integration (NAI), August 2021.

[9] Arvind Narayanan, **Eman Ramadan**, Rishabh Mehta, , Qingxu Liu, Rostand A. K. Fezeu, Udhaya Kumar Dayalan, Saurabh Verma, Peiqi Ji, Tao Li, Feng Qian, and Zhi-Li Zhang. "Lumos5G: Mapping and Predicting Commercial mmWave 5G Throughput". In Internet Measurement Conference (IMC), October 2020. **(Provisional patent filed)**

[10] Arvind Narayanan, **Eman Ramadan**, Jacob Quant, Peiqi Ji, Feng Qian, and Zhi-Li Zhang. "5G Tracker - A Crowdsourced Platform to Enable Research Using Commercial 5G Services". In SIGCOMM, August 2020. [Poster]

[11] Arvind Narayanan, **Eman Ramadan**, Jason Carpenter, Qingxu Liu, Yu Liu, Feng Qian, and Zhi-Li Zhang. "A First Measurement Study of Commercial mmWave 5G Performance on Smartphones". In WWW, April 2020.

[12] **Eman Ramadan**, Pariya Babaie, and Zhi-Li Zhang. "Performance Estimation and Evaluation Framework for Caching Policies in Hierarchical Caches". In Computer Communications, 2019.

[13] Arvind Narayanan, Saurabh Verma, **Eman Ramadan**, Pariya Babaie, and Zhi-Li Zhang. "Making Content Caching Policies 'Smart' Using the DEEPCACHE Framework." In SIGCOMM CCR, 2019.

[14] Pariya Babaie, **Eman Ramadan**, and Zhi-Li Zhang. "Cache Network Management Using BIG Cache Abstraction". In INFOCOM, IEEE, 2019.

[15] Arvind Narayanan, Saurabh Verma, **Eman Ramadan**, Pariya Babaie, and Zhi-Li Zhang. "DeepCache: A Deep Learning Based Framework For Content Caching." In Proceedings of the 2018 Workshop on Network Meets AI & ML (SIGCOMM WKSHPS), (NetAI), 2018. **Best Paper Award**

[16] **Eman Ramadan**, Pariya Babaie, and Zhi-Li Zhang. "A Framework for Evaluating Caching Policies in a Hierarchical Network of Caches". In IFIP Networking Conference and Workshops, IEEE, 2018.

[17] Arvind Narayanan, **Eman Ramadan**, and Zhi-Li Zhang. "OpenCDN: An ICN-based Open Content Distribution System Using Distributed Actor Model." In IEEE INFOCOM Conference on Computer Communications Workshops (IECCO), 2018.

[18] Yang Zhang, **Eman Ramadan**, Hesham Mekky, and Zhi-Li Zhang. "When Raft Meets SDN: How to Elect a Leader and Reach Consensus in an Unruly Network." Asia-Pacific Workshop on Networking (APNet), 2017. **Best Paper Award**

[19] **Eman Ramadan**, Arvind Narayanan, Zhi-Li Zhang, Runhui Li, and Gong Zhang. "BIG Cache Abstraction for Cache Networks." IEEE Conference in Distributed Computing Systems (ICDCS), 2017.

[20] **Eman Ramadan**, Hesham Mekky, B. Dumba, and Zhi-Li Zhang. "Adaptive Resilient Routing via Preorders for SDN." Workshop on Distributed Cloud Computing DCC 2016 (Co-located with PODC'16).

[21] **Eman Ramadan**, Hesham Mekky, B. Dumba, and Zhi-Li Zhang. "Adaptive Resilient Routing via Preorders for SDN." Poster for AT&T Labs SDN Summit 2016.

[22] **Eman Ramadan**, Arvind Narayanan, and Zhi-Li Zhang. "CONIA: Content (provider)-Oriented, Namespace Independent Architecture for Multimedia Information Delivery." IEEE International Conference on Multimedia & Expo Workshops (ICMEW), 2015.

[23] **Eman Ramadan**, Arvind Narayanan, and Zhi-Li Zhang. "OpenCDN: Towards Software Defined Content Distribution Networks" Poster for The Third GENI Research and Educational Experiment Summer Camp (GREE-SC), 2014.

Teaching Experience

University of Minnesota — Minneapolis, MN
Instructor CSCI 4211, Introduction to Computer Networks. — Spring 2023, Spring 2024

University of Minnesota — Minneapolis, MN
Instructor CSCI 5211, Data Communications and Computer Networks. — Fall 2023

University of Minnesota — Minneapolis, MN
Co-Instructor CSCI 4211, Introduction to Computer Networks. — Fall 2017

University of Minnesota — Minneapolis, MN
Teaching Assistant CSCI 1902, Structure of Computer Programming II, undergrad level. — Fall'12 - Spring'13

Alexandria University — Alexandria, Egypt
Graduate Teaching Assistant — Fall 2008 - Spring 2012

- Microprocessor Systems, Introduction to Programming, Structural Programming using C and Introduction to C++. Digital Fundamentals, and Software Engineering.

Internships & Part Time Jobs

IP Lab, Futurewei Technologies, Inc./Huawei R&D USA — Santa Clara, CA
Research Intern — October 2016 - January 2017
Content Caching: simulated the performance of edge servers for caching content if organized in a hierarchical structure to design a better caching replacement policy for deciding which content to cache with the goal of improving the quality of experience for users and handling flash crowds. Also studied the different stages of the content since it is cached till evicted and the effect of its popularity, increasing the cache size, the distribution for content popularity and different hierarchical levels.

Future Network Theory Lab, Huawei Technologies — Hong Kong
Research Intern — August 2016 - September 2016
Building upon the results of recent works on understanding large-scale content distribution systems, CONIA, a Content-provider Oriented Namespace Independent Architecture for content delivery. The key idea of CONIA is to let any willing ISP or third party to participate as a content distribution network (CDN). We studied first steps in the direction of an information-centric network-based open content distribution system (OpenCDN), that allows for better scalability, flexibility, and performance.

Bell-Labs/Alcatel-Lucent — Stuttgart, Germany
Research Intern — Summer 2013
Content Routing: measured the behavior of the YouTube in routing content to understand the possible delays introduced due to DNS/HTTP redirection which increases page load times. To achieve this, several hot and cold videos were requested from different planetlab nodes to measure the time elapsed for each step till receiving the first byte using default DNS resolver, Google DNS resolver and OpenDNS resolver.

Google Inc. — Zurich, Switzerland
Software Engineering Intern — Summer 2011
Received training on Google technologies through formal sessions and self-learning which helped me develop a dashboard for one of Google internal products and add additional features and metrics to existing tools to help the team monitor the status of their internal tools easily.

Alexandria University — Alexandria, Egypt
Graduate Research Assistant — September 2009 - January 2011
Routing in WSN: surveyed wireless sensor network routing protocols and simulators; designed and implemented experiments to evaluate several design choices for routing content from wireless sensors to base-station. Also studied the effect of cross layer design to enhance the performance of the routing protocol. Our conclusion served as guidelines for how routing could be done to save the energy of wireless sensors and thus increase their lifetime.

Ejada Systems Alexandria, Egypt
Software Engineer Fall 2008 - Summer 2009
Helped develop "Irteqaa" web application using ASP.NET, AJAX, JavaScript and C#. Added additional features and maintained Ejada's ASP.Net customized framework.

Awards

- The CSE Excellence in Diversity, Equity, and Inclusion Postdoc Award 2023.
- Best paper award for our paper "DeepCache" SIGCOMM NetAIM workshop 2018.
- Awarded ACM's Student Research Competition travel grant to attend Grace Hopper Celebration 2018.
- Best paper award for our paper "When Raft Meets SDN" APNet workshop 2017.
- Awarded the travel grant to attend GENI NICE (co-located with CoNEXT) 2016.
- Awarded the N2Women travel grant to attend SIGCOMM 2014 and N2Women workshop.
- Awarded the travel grant to attend GENI Summer Camp 2014.
- Awarded the CRA-W grant to attend the Graduate Cohort Workshop 2014.
- Awarded the Arab Women in Computing (AWIC) grant to attend Grace Hopper 2013.
- Google Anita Borg EMEA Scholarship Finalist in 2010.
- Received faculty award for Graduation Project in 2008.
- Dean's List of Distinguished Students in undergraduate study.

Extracurricular Activities

- Chair of the UMN CS Committee for Inclusiveness, Diversity, Equity, & Advocacy (CS-IDEA) since Fall'23.
- Member of the CSE Inclusivity Council since April'23.
- Member of the UMN CSE D&I Alliance Lead Team since Fall'22.
- Member of the UMN CSE D&I Alliance Communications Action Team since Fall'21.
- Member of the UMN CSE D&I Alliance Student & Postdoc Action Team since Spring'21 - Summer'22.
- UMN CS Grad Coordinator for Inclusiveness, Diversity, Equity, & Advocacy Fall'20 - Summer'21.
- Organized N2Women workshop at CoNEXT conference December'19.
- Regular volunteer at Feed My Starving Children (FMSC) charity organization since April 2019.
- Panelist for the UMN CS department's Visit Day event for prospective graduate students in 2019.
- The social coordinator for Computer Science Graduate Student Association (CSGSA) from Fall'18 - Summer'20.
- Volunteered at the UMN CS department's Visit Day event for prospective graduate students in 2018.
- A graduate mentor volunteer for UMN CSE WISE Undergrad-Grad Mentor program in 2017.
- Volunteered at Summer Tech Camp for primary school kids in 2014.

Programming Skills

- **Programming:** Python (Pandas, Matplotlib), C/C++, C#, Java, shell scripting, Android Programming
- **Web:** HTML, JavaScript, CSS, JSP, ASP.Net
- **Network Tools:** NS3, Mininet, OVS, P4-NetFPGA SUME, NS2
- **Databases:** MongoDB, SQL, Oracle
- **Others:** Source Version Control (Git), Gnuplot, Awk, Matlab

Hobbies

- Playing many sports: soccer, volleyball, tennis, badminton, squash, swimming, snowboarding, skiing, boxing, basketball
- Outdoor activities: Hiking, kayaking, boating, biking
- Traveling & learning about other cultures

References

Available upon request