

Sherenaz Waleed Al-Haj Baddar

Personal Information

Nationality: Jordanian

Current Employer: King Abdullah II School for Information Technology,
The University of Jordan, Amman 11942, Jordan.

Phone Number: +962 6 5355000 **Ext.:** 22589

Academic Information:

2005 – 2009 *Kent State University, USA:* Department of Computer Science, Ph.D. Computer Science, GPA: 4.0, Dissertation Advisor: Prof. Kenneth E. Batchner).

2001 – 2003 *The University of Jordan, Jordan:* Department of Computer Science, M.Sc. Computer Science, GPA: 3.96).

1997 – 2001 *The University of Jordan, Jordan:* Department of Computer Science, B.Sc. Computer Science, GPA: 3.86).

Publications:

Journal Papers:

- Sherenaz Al Haj Baddar, Alessio Merlo and Mauro Migliardi: “**Behavioral Anomaly Detection in Forensics Analysis**,” Accepted for publication in IEEE Security and Privacy, July 2017.
- Sherenaz Al Haj Baddar, Alessio Merlo and Mauro Migliardi: “**Generating statistical insights into network behavior using SKETURE**”, Journal of High Speed Networks, 22(1), 65–76, 2016.
- Sherenaz. Al-Haj Baddar, Alessio Merlo, Mauro Migliardi, ”**Anomaly Detection in Computer Networks: A State-of-the-Art Review**”, Journal of Wireless Mobile Networks, Ubiquitous Computing, and Dependable Applications, Vol. 5, No. 4, pp. 29-64, 2014.
- Sherenaz W. Al-Haj Baddar, Basel A. Mahafzah, “**Bitonic Sort on a Chained-Cubic Tree Interconnection Network**”, Journal of Parallel and Distributed Computing, Vol. 74, No. 1, pp. 1744-1761, January 2014.

- Sherenaz W. Al-Haj Baddar and Kenneth E. Batchner, “An 11-Step Sorting Network For 18 Elements”, Parallel Processing Letters, Vol. 19, No. 97, pp. 97-103, 2009.

Conference Papers:

- Mauro Migliardi, Alessio Merlo, Sherenaz W. Al-Haj Baddar: **Reducing the Impact of Traffic Sanitization on Latency Sensitive Applications**. CISIS 2017: 1019-1026.
- Sherenaz W. Al Haj Baddar, Alessio Merlo, Mauro Migliardi, Francesco Palmieri: **Dynamic Latency Sensitivity Recognition: An Application to Energy Saving**. GPC 2017: 138-151
- R. Alqrainy and S. A. H. Baddar, "**DAS: Distributed analytics system for Arabic search engines**", 2016 7th International Conference on Information and Communication Systems (ICICS), Irbid, 2016, pp. 20-26.
- Sherenaz W. Al-Haj Baddar, "**Identifying Energy-Deprivation in Wireless Sensor Networks** ", Proceedings of the 2016 IEEE 30th International Conference on Advanced Information Networking and Applications Workshops-Third International Workshop on Energy-Aware Systems, Communications and Security (EASyCoSe 2016), Crans-Montana, Switzerland , March 23-25, 2016 (Accepted for publication)
- Sherenaz Al-Haj Baddar, Alessio Merlo, Mauro Migliardi, "**SKETURE: A Sketch-based Packet Analysis Tool**", Proceedings of the 7th ACM CCS International Workshop on Managing Insider Security Threats, MIST '15, Denver, Colorado, USA, October 12-16, 2015.

Books:

- Mauro Migliardi, Alessio Merlo, Sherenaz Al-Haj Baddar: "**Adaptive Mobile Computing**", Edited Book, Elsevier, ISBN: 9780128046036, 2017.

- Sherenaz W. Al-Haj Baddar and Kenneth E. Batchter, “**Designing Sorting Networks: A New Paradigm**”, Springer Science + Business Media. New York, USA. ISBN: 978-1461418504, 2011.

Referee/Reviewer in

- JMLR- Journal of Machine Learning Research
- The 10th International Workshop on Security and High Performance Computing Systems (SHPCS 2015)
- The 11th International Workshop on Security and High Performance Computing Systems (SHPCS 2016)
- The 11th International Workshop on Security and High Performance Computing Systems (SHPCS 2017)

Employment:

June 2016 – Present:

Assistant professor of Computer Science, King Abdullah II School for Information Technology, *The University of Jordan, Amman – Jordan*.

- Assistant Dean for Quality and Development Affairs (September 2016- Present).

June 2009 – June 2016:

Assistant professor of Computer Science, King Abdullah II School for Information Technology, *The University of Jordan, Amman – Jordan*.

- Assistant dean for Laboratory Affairs (September 2011- August 2013).
- Assistant Dean for Computer and Quality Affairs, DAR, September 2012
- Assistant Dean for Community Outreach, DAR, September 2011
- Computer Center Director (August 2013 - September 2014)
- Director of Website Contents (October 2015 – September 2016)

Invited Talks / Conferences Talks:

- Sherenaz Al-Haj Baddar, " **Dynamic Latency Sensitivity Recognition: an Application to Energy Saving**", GPC2017: The 12th International Conference on Green, Pervasive and Cloud Computing, Cetara, Amalfi Coast, Italy, May 11-14, 2017.
- Sherenaz Al-Haj Baddar, "**SKETURE: A Sketch-based Packet Analysis Tool**", the 7th ACM CCS International Workshop on Managing Insider Security Threats, MIST '15, Denver, Colorado, USA, October 12-16, 2015.

Memberships:

- *IEEE* www.ieee.org since 2013.

Projects:

- **Packet Analysis:**

- SKETURE:

In this project, I used a combination of C and Java to create a privacy-preserving lightweight packet analysis tool capable of listening to traffic that hits a given Network Interface Card (NIC) and stripping some information from IPV4 packet headers. I could not simply use WireShark or the like, because that would breach users' privacy. The extracted information was used to build statistical summaries of nodes sending and receiving behavior. One-way encoding was used to obfuscate sender and receiver IP addresses and additional information on packets' size, counts, and arrival/departure times were aggregated. SKETURE processed 167 K packets/second and managed to summarize a month-long dump of packet traces from a campus network comprising 11.5G packets in less than 24 hours using an Intel Core i5 processor using no more than 4 GB of memory.

- F-SKETURE:

F-SKETURE is a flow-based version of SKETURE that performs the statistical aggregation on flows rather than single nodes.

- **Clustering:**

- QUIST:

QUIST stands for Quick Clustering, it is a divisive algorithm I designed to cluster multivariate values quickly. Its core idea is simple, when input is sorted, similar values get together, and all you have to do is cut the data at the right places.

- **Computer Security:**

- CATTURE:

This is a network forensics tool that utilizes the summaries generated by SKETURE and QUIST in order to profile nodes in a network and model their behavior. CATTURE aims at identifying **compromised** nodes that deviate from their promised behavior without prior knowledge on what constitutes a normal/abnormal behavior. CATTURE is written in Java and was used to identify statistical anomalies in the summaries SKETURE generated from a campus network. Combined with human network administrators' expertise, CATTURE becomes an effective behavioral anomaly detection tool.

Research Interests:

- Anomaly detection in computer networks.
- Parallel and distributed processing.

Skills:

- Technical: Java | C/C++ | Shell Scripting (Linux/Windows) | MPI using C | nesC | Assembly | Prolog | Matlab | Fortran | COBOL | Pascal | Basic Android Programming | Basic Python | Basic Node.js
- Tools: WireShark | Latex | Overleaf | R | Microsoft Office Suite | Google Docs
- Interpersonal: Strong communication (verbal, non-verbal, and listening) skills | Effective team member | Strong sense of responsibility | Strong problem solving and decision making skills | Very good at negotiation and conflict resolution.

Spoken Languages: Arabic, English, Basic Italian

Scholarships and Awards:

- *Erasmus Mundus - HERMES postdoctoral Scholarship, University of Genoa, Italy, September 2014- May 2015*

References:

- Dr. Mauro Migliardi, DEI, University of Padova, Italy.
- Dr. Francesco Palmieri, University of Salerno, Salerno, Italy.
- Prof. Kenneth E. Batcher, Emeritus Professor, Department of Computer Science, Kent State University, USA.
- Prof. Johnnie Baker, Department of Computer Science, Kent State University, USA.
- Prof. Hassan Peyravi, Department of Computer Science, Kent State University, USA.