Dr. LOUAI AL-AWAMI

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SUMMARY

An enthusiastic teacher and researcher with broad and deep knowledge of both theory and practice in Computer Science and Engineering, Information Technologies, and Computer Networking. Current research interest includes the Internet of Things (IoT), Blockchain, Artificial Intelligence, and Wireless Sensor Networks.

EDUCATION

DOCTOR OF PHILOSOPHY: ELECTRICAL AND COMPUTER ENGINEERING   2013
Queen's University, Kingston, ON, Canada
Thesis: "Distributed Data Storage System for Data Survivability in Wireless Sensor Networks"

MASTER OF SCIENCE: COMPUTER ENGINEERING   2006
King Fahd University of Petroleum & Minerals (KFUPM), Dhahran, Saudi Arabia
Thesis: "A Framework for Reliable and Fault-Tolerant Network Management Architecture"

BACHELOR OF SCIENCE: COMPUTER ENGINEERING   2002
King Fahd University of Petroleum & Minerals (KFUPM), Dhahran, Saudi Arabia

EXPERIENCE

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS (KFUPM)
Dhahran, Saudi Arabia

Assistant Professor   07/2016 to Present
Conducting research, teaching, and course and curriculum development at the Computer Engineering Department.

Queen's University, School of Computing
Kingston, Ontario, Canada

Postdoctoral Fellow   02/2014 to 06/2016
Conducting research on Information Centric Networking (ICN) and Internet-of-Things (IoT).

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS (KFUPM)
Dhahran, Saudi Arabia

Lecturer   06/2006 to 08/2006
Conducting research and teaching at the Computer Engineering Department.

Graduate Assistant   01/2003 to 07/2006
Teaching Logic Design Laboratory, Assembly Language Laboratory, and System Design Laboratory. Developing experiments and a user manual for the TIny Network Interface (TINI) for System Design Laboratory course. Involved in research, organizing academic events, and served in various university committees.

SAUDI ARAMCO
Dhahran, Saudi Arabia

Summer Training   06/2001 to 08/2001
Undergraduate training program.

Summer Employment   06/2018 to 08/2018
Applications of Blockchain Technology in Human Resources

COURSES TAUGHT

- COE 200: Digital System Design
- COE 205: Assembly Language and Computer Organization
- COE 400: System Design Laboratory
- ICS 103: Computer Programming in C Language
- COE 241: Data and Computer Communication
- COE 344/540: Computer Networks (UG/G)
- COE 353: Fundamentals of Computer Communications
- COE 499: Internet of Things (IoT): Concepts and Technologies
- ICS 520: AI and ML for Robotics

COURSE DEVELOPEMENT

COE 400: System Design Laboratory

Involved in designing experiments and lab manual for a laboratory-based course. The course sums up the experiences and knowledge students have gained in all previous courses through a real-life project. The project involves building a fully functional system using embedded technology, software programming, and networking using a programmable hardware platform, sensors, and actuators. Target applications developed by the students include home automation, security system, home monitoring, etc.

COE 499: Internet of Things (IoT) - Concepts and Technologies

I have recently developed an undergraduate course on the Internet-of-Things at KFUPM. The course exposes students to the challenges and opportunities of this emerging area. The course covers different aspects including networking technologies, applications, and software development of IoT systems; in addition to big data analytics and machine learning. The course also covers IoT cloud technologies and equips students with the needed knowledge and skills required to develop IoT systems for different applications.

PUBLICATIONS

- L. Al-Awami, " IDStore: a Compressed Storage using Elevated Codes for IoT Tracking Applications," submitted to the 2020 IEEE Sensors Conference.
- M. Al-Darwbi and L. Al-Awami, "A Mechanism for Copyright Protection under Information-Centric Networking," 2019 2nd IEEE Middle East and North Africa COMMunications Conference (MENACOMM), Manama, Bahrain, 2019, pp. 1-6.
- M. Asiri, T. Sheltami, L. Al-Awami and A. Yasar, "A Novel Approach for Efficient Management of Data Lifespan of IoT Devices," in IEEE Internet of Things Journal. doi: 10.1109/JIOT.2019.2955099.
- A. Alshantout and L. Al-Awami, "Enhancing MQTT-SN Performance via Fountain Codes in Extreme Conditions," 2019 15th International Wireless Communications & Mobile Computing Conference (IWCMC), Tangier, Morocco, 2019, pp. 1184-1189.
- Louai Al-Awami, Hossam S. Hassanein, Robust Decentralized Data Storage and Retrieval for Wireless Networks, Computer Networks, vol. 128, pp.41-50, Dec. 2017.
- Al-Awami, L. and Hassanein, H.S., "Distributed Data Storage Systems for Data Survivability in Wireless Sensor Networks using Decentralized Erasure Codes," Computer Networks, vol. 97, pp.113-127, Mar. 2016.
- Al-Awami, L. and Hassanein, H.S., "Energy Efficient Distributed Storage Systems with LT-Codes in Resource-Limited Wireless Systems," IEEE Global Communications Conference (GLOBECOM), pp. Dec. 2015
- Al-Awami, L.; Hassanein, H., "Energy Efficient Data Survivability for WSNs via Decentralized Erasure Codes," Local Computer Networks (LCN), 2012 IEEE 37th Conference on, pp.577,584, 22-25 Oct. 2012.
- Al-Awami, L.; Hassanein, H., "Data Survivability for WSNs via Decentralized Erasure Codes," Wireless Communications and Mobile Computing Conference (IWCMC), 2012 8th International, pp.94,99, 27-31, Aug. 2012.
- Ahmad El Kouche, Louai Al-Awami, Hossam Hassanein, "Dynamically Reconfigurable Energy Aware Modular Software (DREAMS) Architecture for WSNs in Industrial Environments", Procedia Computer Science, vol. 5, 2011, pp.264-271.
- El Kouche, A.; Al-Awami, L.; Hassanein, H.; Obaia, K., "WSN Application in the Harsh Industrial Environment of the Oil Sands," Wireless Communications and Mobile Computing Conference (IWCMC), 2011 7th International, pp.613-618, 4-8 July 2011.

- Abd-El-Barr, M. I. and Al-Awami, L. A.," Analysis of Direct Cover Algorithms for Minimization of MVL Functions", Proceedings of the IEEE 15th International Conference on Microelectronics (ICM'03), Dec. 9-11, 2003. pp. 308 –312.
- Abd-El-Barr, M. I. and Al-Awami, L. A., "Iterative-based Minimization of Unary 4-valued Functions for Current mode CMOS Realization", Proceedings of the IEEE 34th International Symposium on Multiple-Valued Logic, 19-22 May, 2004. pp. 315 – 320.

─────────── **Professional Activities** ───────────

- Serving currently as the counselor for the IEEE Student Branch at KFUPM since 2018.
- Serving as a reviewer in many technical journals including; IEEE Internet of Things Journal, IEEE Transaction on Distributed Computing, Journal of Network and Computer Applications, and the International Journal of Wireless Networks and Applications.
- Served as a TPC member and a reviewer in many reputable conferences including, ICC, GC, LCN, IWCMC, ANT, MENACOMM, and 3ICT2020.

─────────── **PROJECTS** ───────────

Sprouts Sensor Platform
http://www.sensornodes.com
January 2009 to January 2012

This project focuses on the design and development of a modular and general-purpose wireless sensor platform for harsh and industrial applications with energy harvesting capability. The design includes fabrication and programming of sensor and sink nodes, in addition to the development of protocol and reliability mechanisms. Besides, the platform provides a web-based user interface accessible through desktop/mobile portal. Sprouts platform is the result of an industry and academic collaboration at Queen's University and has successfully been implemented. A prototype of Sprouts has been presented at the Ontario Center of Excellence (OCE) Discovery 2011.

Privacy-Preserving Contact Tracing Bracelet
June 2020 to September 2020

This project was funded by the Deanship of Scientific Research at KFUPM under the "Proof-of-Concept Grant" to implement a prototype for a smart bracelet to help in the fight against COVID-19. The smart bracelet helps users respect social distancing, tracks one's contacts using BLE beacons, and alerts potential patients without compromising privacy. The system also monitors the wearer's health and predicts risk level based on symptoms such as vital signs, coughing, and violations of social distancing rules. The system was implemented using Raspberry Pi and NI MyRio IoT platforms. The project includes a mix of technologies such as IoT, localization, ML, and BLE all in one package.

─────────── **RESEARCH INTERESTS** ───────────

o Internet-of-Things (IoT)
o Artificial Intelligence
o Wireless Sensor Networks
o Blockchain
o Distributed Storage Systems
o Information-Centric Networking (ICN)

─────────── **AFFILIATIONS** ───────────

o Assistant Professor, Computer Engineering Department at King Fahd University of Petroleum & Minerals (KFUPM)
o Member of the Institute of Electrical and Electronics Engineers (IEEE).
o Member of the IEEE Communications Society.
o Member of the IEEE Information Theory Society.
o Member of the IEEE Internet of Things Community.
o Member of the Internet of Things, Ad Hoc and Sensor Networks Technical Committee.

─────────── **LANGUAGES** ───────────

- Arabic – Native speaker   **- English –** Speaks and writes fluently

─────────── **REFERENCES** ───────────

Available upon request.