

# Dr. Ahmad H. Sawalmeh

## Computer Engineering - Artificial Intelligence and Robotics Technology

Address | Alfaisal University – Riyadh - Saudi Arabia

### Search Results

Mobile: (WhatsApp): +962799444116

Email Address: [sawalmeh@gmail.com](mailto:sawalmeh@gmail.com) | [asawalmeh@alfaisal.edu](mailto:asawalmeh@alfaisal.edu)

### Google Scholar account:

<https://scholar.google.com/citations?user=ng-tEQkAAAAJ&hl=en>

### Research Gate account:

<https://www.researchgate.net/profile/Ahmad-Sawalmeh>

### Key Skills

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- Artificial Intelligence and Data Science, Robotics, Machine Learning and Deep Learning.
- Arduino, and Arduino IDE for programming microcontrollers
- Wireless communication with Intelligent UAVs.
- Internet of Things (IoT) and Machine-to-Machine (M2M) Communication.
- Computer Optimization and AI Algorithms.
- Computer architecture and design - Assembly Language, MIPS and Motorola 68K family.
- Computer networks.
- Operating systems, Linux (Fedora Red Hat, SUSE, and Mandrake).
- VERILOG Hardware Description Language (MAX+plus II ALTERA, LeonardoSpectrum from Mentor Graphics)
- Programming languages Python, C++, C.
- TensorFlow, AI, Machine learning and Deep learning platforms.
- LaTeX.
- Matlab.
- Management and strategic planning.
- Quality and Academic Accreditation.

### Professional Summary

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- Research expertise in wireless communication using smart unmanned aerial Vehicles (UAVs), visible light communication, and aerial networks.
- Published more than 30 impact factor journal papers
- More than ten years of teaching and research experience
- Research work highlighted in local and global media as well as cited over 180 times

### Education

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#### Doctor of Philosophy in Engineering

Sep. 2015 - Aug. 2020

University Tenaga Nasional, Malaysia

Dissertation: "Deployment Strategies and Optimization in Providing Wireless Coverage using Intelligent Unmanned Aerial Vehicles (UAVs)".

In short, the research focuses on the deployment of unmanned aerial vehicle (UAV) as aerial base station in providing wireless coverage for outdoor and indoor users.

- Master of Science in Computer Engineering (Very Good)** **April. 2006**  
 Jordan University of Science and Technology, Jordan  
 Thesis: HARDWARE DESIGN OF AES S-BOX USING PIPELINING STRUCTURE OVER  $GF((2^4)^2)$
- Bachelor of Science in Computer Engineering (Very Good)** **Jun. 2003**  
 Jordan University of Science and Technology, Jordan

## Career History

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### Aug 2023 - present

College of Engineering - Software Engineering Department **Senior Lecturer**

### Oct 2022 – Aug 2023

Irbid National University, Data science and artificial intelligence Department **Assistant Professor**

*Department of Artificial Intelligence and Data Science, Faculty of Science and Information Technology.*

- ✓ **Head of the Department:** Teaching classes and labs within the department of Artificial Intelligence and Data Science.
- ✓ Head of the Quality and Academic Accreditation unit.
- ✓ Taught courses of Artificial Intelligent, AI Algorithms, Computer Architecture, Data science with python, Data Base, and Digital logic design. Programming language c, c++, pyhton.
- ✓ Conducting research within the department of Artificial Intelligence and Data Science.

### Sep 2018 – Oct 2022

Northern Border University, Arar, KSA **Senior Lecturer**

*Department of Computer Science, Faculty of Science, Northern Borders University, Arar – KSA.*

- ✓ Faculty member: Teaching classes and labs within the department of Computer Science.
- ✓ Head of the Information Technology Unit & Quality Systems at the Quality and Academic Accreditation Deanship.
- ✓ Taught courses of Computer Networks, Operating Systems, Computer Architecture, Data Structures and Algorithms, and Digital logic design
- ✓ Teaching computer science graduate program at the Deanship of Community Service and Continuing Education.
- ✓ Conducting research within the department of computer science.
- ✓ Member of the remote sensing unit
- ✓ Published 15 high impact factor journal and 5 conference papers
- ✓ Member of the academic accreditation committee for the computer science program

### Aug 2006 – Feb 2016 Technical Vocational Training Corporation (TVTC) **Lecturer**

- ✓ Lecturer in the Computer Science Department at the Technical Vocational Training Corporation (TVTC), Kingdom of Saudi Arabia. [www.tvtc.gov.sa](http://www.tvtc.gov.sa)
- ✓ Taught courses of Computer Networks, Operating Systems, Algorithms, Circuits, and Digital logic design

### Jan 2003 – Nov 2004 Jordan University of science and Technology (JUST) **Teaching and Research assistant**

- ✓ Teaching and Research assistant for Advanced Computer Design Course (Verilog HDL Language), Computer Networks course, Digital Logic Design Lab in the Department of Computer Engineering, at Jordan University of science and Technology. [www.just.edu.jo](http://www.just.edu.jo)

## AWARDS

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- ✓ Vice Chancellor's Award; Best Postgraduate Student Awarded 2019-2020 at Universiti Tenaga Nasional (UMITEN) Malaysia.

## Publications

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### Journals

- [1]. Shakhathreh, Hazim, **Ahmad H. Sawalmeh**, Ala Al-Fuqaha, Zuochoao Dou, Eyad Almaita, Issa Khalil, Noor Shamsiah Othman, Abdallah Khreishah, and Mohsen Guizani. "Unmanned aerial vehicles (UAVs): A survey on civil applications and key research challenges." *Ieee Access* 7 (2019): 48572-48634.
- [2]. **Sawalmeh A**, Alenezi, A. H., Shakhathreh, H., Almutiry, M., The Impact of Using Intelligent Reflecting Surfaces (IRSs) on Minimizing Operational Costs in UAV Wireless Networks. (Minor revision) Operation research journal Elsevier. (2023).
- [3]. Igried B, Sarhan A, **Sawalmeh A**, Anan M, A novel game theoretic approach for market-driven dynamic spectrum access in cognitive radio networks. *Wireless Networks* 2023 **(Accepted)**
- [4]. Alenezi, A. H., Nazzal, M., **Sawalmeh, A.**, Khreishah, A., Shao, S., & Almutiry, M. (2022). Machine learning regression-based RETRO-VLP for real-time and stabilized indoor positioning. *Cluster Computing*, 1-13.
- [5]. Abu-Baker, A., Shakhathreh, H., **Sawalmeh, A.**, & Alenezi, A. H. (2023). Efficient Data Collection in UAV-Assisted Cluster-Based Wireless Sensor Networks for 3D Environment: Optimization Study. *Journal of Sensors*, 2023.
- [6]. Haq, M. I. U., Khalil, R. A., Almutiry, M., Sawalmeh, A., Ahmad, T., & Saeed, N. (2023). Robust graph-based localization for industrial Internet of things in the presence of flipping ambiguities. *CAA/ Transactions on Intelligence Technology*.
- [7]. Rania Djehaiche, Salih Aidel, **Ahmad Sawalmeh**, Nasir Saeed and Ali H. Alenezi. "Adaptive Control of IoT/M2M Devices in Smart Buildings using Heterogeneous Wireless Networks". **Accepted**, *IEEE Sensors Journal*, 2023.
- [8]. Nazzal, Mahmoud, **Ahmed Sawalmeh**, Sihua Shao, Muhammad Anan, Abdallah Khreishah, and Ali Alanazi. "Retro-VLP: Towards Single Light Source-based Real-time Indoor Positioning." *13th International Conference on Information and Communication Systems (ICICS) 2022*, pp. 485-490. IEEE, 2022.
- [9]. Ali Alanazi, Nazzal, Mahmoud, **Ahmed Sawalmeh**, Sihua Shao, Abdallah Khreishah. "Machine Learning Regression-Based RETRO-VLP for Real-Time and Stabilized Indoor Positioning." *Cluster Computing*, 12- 2022.
- [10]. **Sawalmeh, Ahmad**, Noor Shamsiah Othman, Guanxiong Liu, Abdallah Khreishah, Ali Alenezi, and Abdulaziz Alanazi. "Power-Efficient Wireless Coverage Using Minimum Number of UAVs." *Sensors* 22, no. 1 (2021): 223.
- [11]. Shakhathreh, Hazim, **Ahmad Sawalmeh**, Ali H. Alenezi, Sharief Abdel-Razeq, Muhannad Almutiry, and Ala Al-Fuqaha. "Mobile-IRS Assisted Next Generation UAV Communication Networks." *arXiv preprint arXiv:2207.03622* (2022). (Under review)
- [12]. **Sawalmeh, Ahmad**, Noor Shamsiah Othman, and Hazim Shakhathreh. "Efficient deployment of multi-UAVs in massively crowded events." *Sensors* 18, no. 11 (2018): 3640
- [13]. **Sawalmeh, Ahmad H.**, Noor Shamsiah Othman, Hazim Shakhathreh, and Abdallah Khreishah. "Wireless coverage for mobile users in dynamic environments using UAV." *IEEE Access* 7 (2019): 126376-126390.
- [14]. **Sawalmeh, Ahmad**, Noor Shamsiah Othman, Hazim Shakhathreh, and Abdallah Khreishah. "Providing wireless coverage in massively crowded events using UAVs." In *2017 IEEE 13th Malaysia International Conference on Communications (MICC)*, pp. 158-163. IEEE, 2017.
- [15]. **Sawalmeh, Ahmad H.**, and Noor Shamsiah Othman. "An overview of collision avoidance approaches and network architecture of unmanned aerial vehicles (UAVs)." *International Journal of Engineering and Technology*

- [16]. Shakhathreh, Hazim, Abdallah Khreishah, Ayoub Alsarhan, Issa Khalil, **Ahmad Sawalmeh**, and Noor Shamsiah Othman. "Efficient 3D placement of a UAV using particle swarm optimization." In *2017 8th International Conference on Information and Communication Systems (ICICS)*, pp. 258-263. IEEE, 2017. [17].
- Shakhathreh, Hazim, Abdallah Khreishah, Noor Shamsiah Othman, and **Ahmad Sawalmeh**. "Maximizing indoor wireless coverage using uavs equipped with directional antennas." In *2017 IEEE 13th Malaysia International Conference on Communications (MICC)*, pp. 175-180. IEEE, 2017.
- [18]. Shakhathreh, Hazim, Waed Malkawi, **Ahmad Sawalmeh**, Muhammad Almutiry, and Ali Alenezi. "Modeling ground-to-air path loss for millimeter wave uav networks." *Journal of Green Engineering*, 2021, Volume:11 Issue:1.
- [19]. Hayajneh, Khaled F., Khaled Bani-Hani, Hazim Shakhathreh, Muhammad Anan, and **Ahmad Sawalmeh**. "3d deployment of unmanned aerial vehicle-base station assisting ground-base station." *Wireless Communications and Mobile Computing 2021* (2021).
- [20]. Shakhathreh, Hazim, Ali Alenezi, **Ahmad Sawalmeh**, Muhammad Almutiry, and Waed Malkawi. "Efficient placement of an aerial relay drone for throughput maximization." *Wireless Communications and Mobile Computing 2021* (2021)
- [21]. Jasim, M. A., Shakhathreh, H., Siasi, N., **Sawalmeh, A. H.**, Aldalbahi, A., & Al-Fuqaha, A. (2021). A Survey on Spectrum Management for Unmanned Aerial Vehicles (UAVs). *IEEE Access*, 10, 11443-11499.
- [22]. Alsmadi, I., Aljaafari, N., Nazzal, M., AlHamed, S., **Sawalmeh, A.**, Vizcarra, C. P., ... & Alhumam, A. (2022). Adversarial Machine Learning in Text Processing: A Literature Survey. *IEEE Access*.
- [23]. Abdel-Razeq, S., Shakhathreh, H., Alenezi, A., **Sawalmeh, A.**, Anan, M., & Almutiry, M. (2021). PSO-Based UAV Deployment and Dynamic Power Allocation for UAV-Enabled Uplink NOMA Network. *Wireless Communications and Mobile Computing*, 2021.
- [24]. Shakhathreh, H., Hayajneh, K., Bani-Hani, K., **Sawalmeh, A.**, & Anan, M. (2021). Cell on Wheels-Unmanned Aerial Vehicle System for Providing Wireless Coverage in Emergency Situations. *Complexity*, 2021.
- [25]. Aljaafari, N., Nazzal, M., **Sawalmeh, A.**, Vizcarra, C. P., ... & Alhumam, A "On the Factors Impacting Adversarial Attack and Defense Performances in Federated Learning Systems" Accepted, 03-2022 *IEEE Transactions on Engineering Management*.
- [26]. Vizcarra, C. P, **Sawalmeh, A** Aljaafari, N., Nazzal, M., Adversarial Attack on Saudi License Plate Recognition System. minor review *Human-centric Computing and Information Science*.
- [27]. Nazzal, M., **Sawalmeh, A.**, Abdallah Khreishah, Retro-VLP: Towards Single Light Source-based Real-time Indoor Positioning" Accepted 13th International Conference on Information and Communication Systems, IEEE ICICS 2022.
- [28]. Ali Alanazi, Ahmad Sawalmeh, Hazim Shakhathreh, A Novel Mining Approach for Data analysis and processing using Unmanned Aerial Vehicles, minor review *Complexity*.
- [29]. Hazim Shakhathreh, **Ahmad Sawalmeh**, Ali Alanazi Next Generation of IRS-Assisted UAV Communications in Wireless IoT Networks. Submitted to IEEE systems journal.
- [30]. Amjad Abu baker, **Ahmad Sawalmeh**, Ali Alanazi, Hazim Shakhathreh, Maximizing Lifetime of UAV-Assisted Wireless Sensor Networks for Efficient Data Collection Submitted to IEEE Sensor Networks.
- [31]. Abdel-hafeez, Saleh, **Ahmed Sawalmeh**, and Sameer Bataineh. "High performance AES design using pipelining structure over GF ((2 4) 2)." *2007 IEEE International Conference on Signal Processing and Communications*. IEEE, 2007.

## COMMITTEES

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- [1]. Coordinator of the of Executive Committee for Quality and Academic Accreditation [2018 – 2022]
- [2]. Member of the strategic plan committee at the Quality and Academic Accreditation Deanship [2018 – 2022]
- [3]. Member of the Computer Science Department Graduation project committee [2021 – 2022]
- [4]. Member of the Computer Science Program Supervising Committee of the Evaluation Study Project at the Program Accreditation Level.
- [5]. Member of the Council of the Deanship of Quality and Academic Accreditation [2019 – 2022]
- [6]. Member of the Occupational Safety Committee, College of Science [2021 – present]
- [7]. Member of the Technical Committee for Academic Accreditation at Quality Deanship [2019 – 2022]

- [8]. Member of The Remote Sensing Unit [2021 – 2022]
- [9]. Member of the academic accreditation committee for the computer science program [2020 – 2022]

## GRANTS & FUNDING PROJECTS

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- ✓ A Novel Mining Approach using Ground Penetrating Radar Tomography Mounted on Intelligent Unmanned Aerial Vehicles UAVs Deputyship for Research and Innovation, Ministry of Education in Saudi Arabia for funding this research work through the project **Number-6864 2020 IF.**
- ✓ Wireless Coverage for Mobile Users in Dynamic Environments Using UAVs. Universiti Tenaga Nasional, BOLD Grant 10289176/B/9/2017/16.
- ✓ Maximizing indoor wireless coverage using UAVs **US NSF grants CNS-1647170 and EEC-1560131.**
- ✓ Efficient Deployment of Multi-UAVs in Massively Crowded Events Universiti Tenaga Nasional, **UNIIG 2017 grant.**
- ✓ Power-Efficient Wireless Coverage Using Minimum Number of UAVs Universiti Tenaga Nasional Internal Grant (**UNIIG2018**) **J510050800.**
- ✓ Real-time Indoor Positioning with Visible light communication (VLC) **ENGA-2022-11-1649** from the Deanship of Scientific Research at Northern Border University
- ✓ A Novel Communication Approach in Dynamic Environments for Next Generation Wireless Networks **SCIA-2022-11-1466** from the Deanship of Scientific Research at Northern Border University

## Training Courses (Sample)

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- ✓ Training course in TCP/IP-based network using Ethernet LAN media, "Cisco Networking Academy Program," JUST Jordan.
- ✓ Geographic Information System (GIS) Training Course using GeoMedia Professional 5.2 (40 hours).
- ✓ A foundation Management Training Program for New Entrance to Business, At EuroJordanian Advanced Business Institute (EJABI), In cooperation with the International Finance Corporation (IFC).
- ✓ Communication Skills Training Course, At EuroJordanian Advanced Business Institute (EJABI), In cooperation with the International Finance Corporation (IFC).
- ✓ Owner/Manager and Human Resources Training Course, At EuroJordanian Advanced Business Institute (EJABI), In cooperation with the International Finance Corporation (IFC).

## REFERENCES

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- ✓ **Prof. Ala Al-Fuqaha**, Department of Computer Science, Western Michigan University, Kalamazoo, MI, 49008, USA. (e-mail: [ala.al-fuqaha@wmich.edu](mailto:ala.al-fuqaha@wmich.edu))
- ✓ **Prof. Abdallah Khreishah**, Department of Electrical and Computer Engineering, New Jersey Institute of Technology. (email [abdallah@njit.edu](mailto:abdallah@njit.edu) )
- ✓ **Dr. Noor Shamsiah Othman**, Universiti Tenaga Nasional, College of Graduate Study. (e-mail: [Shamsiah@uniten.edu.my](mailto:Shamsiah@uniten.edu.my))
- ✓ **Prof. Dr. Muhannad Almutairy**, Head of the Remote Sensing Unit (RSU), Northern Border University, Arar 73222, Saudi Arabia. (e-mail: [muhannad.almutairy@nbu.edu.sa](mailto:muhannad.almutairy@nbu.edu.sa))

## PROFESSIONAL LINKS AND NETWORKING

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- ✓ Google Scholar: <https://scholar.google.com/citations?user=ng-tEQkAAAAJ&hl=en>  
Total number of citations = 1850
- ✓ Research gate: <https://www.researchgate.net/profile/Ahmad-Sawalmeh>
- ✓ ORCID: <https://orcid.org/my-orcid?orcid=0000-0002-7040-8963>
- ✓ LinkedIn: <https://www.linkedin.com/in/ahmad-sawalmeh-60446736/>
- ✓ Publons (WoS): <https://publons.com/researcher/3923761/ahmad-sawalmeh/>
- ✓ Web of Science ResearcherID: [AAZ-9563-2020](https://www.webofscience.com/wos/author/uri?authorId=AAZ-9563-2020)
- ✓ IEEE: <https://ieeexplore.ieee.org/author/37086059141>
- ✓ Scopus Author ID: <https://www.scopus.com/authid/detail.uri?authorId=57194440590>