Asem Salah

Assistant Professor
Department of Computer System Engineering.
Faculty of Engineering and Information Technology.
Arab American University, Palestine.
Jenin, West Bank, State of Palestine.

Asem has received the PhD and MSc degrees from Universiti Putra Malaysia (UPM), Malaysia, in May 2015, and March 2011, respectively, and the BSc degree from the Arab American University-Palestine (AAUP), Palestine, in June 2005.

Currently, he is working for the Department of Computer System Engineering, Faculty of Engineering and Information Technology, Arab American University, Palestine (AAUP) since Feb. 2020. Before this, He worked for the Department of Electrical Engineering, Faculty of Engineering, the University of Malaya (UM) between Dec. 2018 and Dec. 2019. Ahead of that, he worked for the Department of Computer and Communication Systems Engineering, Faculty of Engineering, University of Putra Malaysia (UPM), from May 2015 to Oct. 2018. During his work, he had taught several courses in Computer, Electrical and Communications Engineering subjects. Moreover he had been involved in several research projects, in IR 4.0, Big Data, Artificial Intelligence (AI), particularly, Machine Learning, Wireless Sensors Network, D2D Communications, Mobile Communication Systems, 5G, Passive Radar Sensors, and FSR. He has successfully published more than 30 research papers in reputable journals and international conferences.

PERSONAL DETAILS

Full Name: Asem Ahmed Salah

Date of Birth: 13 April 1983

Nationality: Palestinian

Marital Status: Married

Mobile: +60 172 788 755
           +97 0592820274

Email: Asem.salah@aaup.edu
         asemsalah@gmail.com,

Skype: asem83asem

Google Scholar: Asem A. Salah

ResearchGate: https://www.researchgate.net/profile/Asem_Salah2

EDUCATION

PhD in Communications and Network Engineering   May 2015
Universiti Putra Malaysia (**UPM**), Malaysia
Faculty of Engineering
Department of Computer and Communication Systems Engineering
MSc in Communications and Network Engineering   March 2011
Universiti Putra Malaysia (**UPM**), Malaysia
Faculty of Engineering
Department of Computer and Communication Systems Engineering
BSc in Telecommunication Technology   June 2005
Arab American University Palestine (**AAUP**), Palestine
Faculty of Information Technology
Department of Telecommunication Technology

AWARDS and MEMBERSHIPS

- MIS scholarship, Ministry of Education Malaysia   2012-2015
- MTCP scholarship, Ministry of Higher Education Malaysia   2009-2011
- Best paper award for INTCET2018   2018
- Member of the Institute of Electronics, Information, and Communication Engineers (IEICE), Japan.   2010
- Member of the Institution of Engineering and Technology (IET), UK   2014
- Member of Institute of Electrical and Electronics Engineers (IEEE), USA   2016
- Reviewer in the top IEEE conferences like ICC2016, VTC2019.

TEACHING & RESEARCH EXPERIENCE

<u>**Assistant Professor/Lecturer**</u> (Part-time)   <u>Feb. 2020 – Present</u>
Arab American University (AAUP)   Jenin –Palestine
Faculty of Engineering and information Technology
   <u>**Teaching Tasks**</u>
   o   Prepare and deliver lectures to undergraduate students including the E-learning sessions:
   o   Evaluate and grade students' class work, laboratory performance, assignments, and papers.
   o   Prepare course materials such as syllabi, homework assignments, handouts, and E-learning material.
   o   Plan, evaluate, and revise curricula, course content, and course materials and methods of instruction.

<u>**Academic Staff**</u>   <u>Dec 2018 – Dec 2019</u>
University of Malaya (UM)   Kuala Lumpur, Malaysia
Department of Electrical Engineering
   <u>**Teaching Tasks**</u>
   o   Prepare and deliver lectures to undergraduate students including the E-learning sessions:
     - Programming 1 (C++ based) KIE1004 Sem1- 2019/2020.
     - Programming 1 (C++ based) KIE1004 Special Sem. 2018/2019.
     - Electrical Circuits Analysis I (KBEB2131) Special Sem. 2018/2019.
   o   Supervise and counsel students on theoretical and practical activities.

- o Evaluate and grade students' class work, laboratory performance, assignments, and papers.
- o Prepare course materials such as syllabi, homework assignments, handouts, and E-learning material.
- o Plan, evaluate, and revise curricula, course content, and course materials and methods of instruction.
- o Initiate, facilitate, and moderate classroom discussions.

<u>**Research Activities**</u>
- o Conducting a research project which is recently funded by **IIRG** for Optimisation of Biogas Production from Palm Oil Mill Effluent (POME) based on **IR4.0** for Positioning as a Higher Value Renewable Energy (RE) Resource in Malaysia, using the **Machine Learning Techniques.**

- o Conducting a research project which includes the latest technologies and standers in **Big Data**, and **Artificial Intelligence (AI)**, especially in **Machine Learning,** which deployed to enhance the D2D communications, in 5G. By investigating the smart resource allocation paradigms with the adoption of the data analytics and the role of Deep Learning methods in making the system intelligent regarding being self-aware, self-adaptive, proactive and prescriptive.

- o Write grant proposals to procure external research funding:
  - ▪ **FRGS**: A Fundamental Study on Deep Learning Algorithm for Multi-Cell Device-To-Device Communications in 5G Networks.
  - ▪ **IIRG**: Smart and Sustainable Manufacturing Strategies of Thermoelectric Self-Charging Storage Module Based on IR 4.0 Principles
  - ▪ **TRGS**: Machine Learning Techniques for Optimization of Biogas Production from Palm Oil Mill Effluent.
  - ▪ **TRGS**: IoT-Peat: IoT Deployment for Peatland Forest Management and Monitoring (collaboration project with UPM).

- o Act as advisers to student organisations:
  - ▪ Following up with some of the research students and helping them in conducting their research projects
- o Assessor for Research Methodology presentations and proposals 2018/2019 -Department of Electrical Engineering.
- o Participate in organising faculty events:
  - ▪ Undergraduate Research Fellowship Bootcamp: Nurturing Research Passion, organised by the faculty, Feb 2019.
  - ▪ EE Makerthon 2019: Drone Challenge for 2nd year Department of Electrical Engineering Undergraduate Students.
- o Create Research Collaborations:
  - ▪ Research collaboration with UPM, MIMOS Berhad, UiTM, NICT-Japan, and FSKTM-UM
- o Prepare and submit required reports related to instruction.

<u>Lecturer and Post-Doctoral</u> June 2016- Oct 2018
Universiti Putra Malaysia (UPM) Serdang, Malaysia

Department of Computer and Communication Systems Engineering
<u>**Teaching**</u>
- o Taught lectures to both postgraduate and undergraduate students and evaluate their progress and performance. Some of the taught courses are:
  - ▪ Programing I

    This course introduced the student to object-oriented programming through a study of the concepts of program specification and design, algorithm development, and coding and testing using a modern software development environment

  - ▪ Advanced Cellular and Satellite Communication

    This course covers advanced topics in wireless mobile communications systems with a focus on the LTE, LTE-A, and the future technologies for 5G, such as massive MIMO, In addition to the latest Satellite technologies.

- Signals and Systems

  The course presents and integrates the basic concepts for both continuous-time and discrete-time signals and systems. Signal and system representations are developed for both time and frequency domains. These representations are related through the Fourier transform and its generalizations, which are explored in detail. Filtering and filter design, modulation, and sampling for both analogue and digital systems, as well as exposition and demonstration of the basic concepts of feedback systems for both analogue and digital systems, are discussed and illustrated.

- Circuit Analysis

  This course introduces the basic concepts and engineering methods of DC circuit analysis. The course includes Ohm's Law, Kirchhoff's Law, series and parallel circuits, Mesh and Nodal analysis, Superposition, Source Transformation, Thevenin's and Norton's theorems, Capacitor, Inductor and responses of First Order circuits.

- Digital Logic Design

  The course covered the design and application of digital logic circuits, including combinational and sequential logic circuits.

- Computer Network laboratory

  The course covered the practical application for the fundamental principles of computer networks and basic security topics, including symmetric and public-key cryptography. Real and emulated switches and routers were used in practical labs.

- C++,

  This course introduced the student to object-oriented programming through a study of the concepts of program specification and design, algorithm development, and coding and testing using a modern software development environment.

- Wireless Mobile Communications,

  This course covers the fundamentals of wireless mobile communications systems with focus on the physical layer: the wireless channel and its characteristics, how different digital communication systems perform in the wireless environment, what techniques can be used to mitigate the effects of the wireless channel and improve performance, and how multiple users can share the channel to communicate with a single base station.

o Develop course materials.
  - I have developed course materials for Wireless Mobile Communications and Visual Basic Programming courses.
o Deliver Distinguished Lectures
  - I was invited by the department to deliver a distinguished lecturer "prospects and challenges in the latest wireless communication technologies".

Supervision
o Supervising several postgraduate and undergraduate students, and helping them in conducting their research projects
  - 4 PhD Level
  - 5 Undergraduates.

<u>Research Activities</u>
o Conducting and leading research projects:
  - **Development of Cognitive Radio Wireless Sensor Network Node**: Developing a prototype uses the Reinforcement Learning -based spectrum-aware clustering algorithm that allows a member node to learn the energy and cooperative sensing costs for neighboring clusters to achieve an optimal solution. Then use Reinforcement Learning-based clustered Cooperative Channel Sensing algorithm that learns channels' dynamic behaviors in terms of channel availability, sensing energy cost, and channel impairment to achieve optimal sensing sequence and optimal set of channels. **(PRGS Grant)**
  - **Networked ASEAN Peat Swamp Forest Communities**: Develop an IoT-based solution for peat swamp forest monitoring, targeting the environmental and agricultural issues by deploying, analysing and disseminating information using an IoT-based peat-swamp forest monitoring system, especially on sustainability. And at the same time engaging with the peat swamp forest communities for social innovation aspects. (**International Collaboration**), (Funded by **ASEAN IVO, NICT, Japan**)
  - **Elderly People Observation using Micro-Doppler in Forward Scattering Radar System**: Developing a new approach to detect and monitor the elderly people's activities and fall events by using the Forward Scattering Radar system, as a main device Doppler sensing distinguishing features of fall events from non-

fall activities. The joint time-frequency representations are used for detection, while the support vector machine has been utilized in the classification process. (**UPM-UiTM Collaboration**), (**FRGS Grant**)

- **Advancing the State of the Art of MIMO: the key to the successful evolution of wireless networks**: provide a framework of advanced MIMO solutions for realizing green, secure, and high data throughput wireless communications. (**International Collaboration),** (Funded by the **European Commission, HORIZON 2020**)

- **Power Allocation Algorithm for Multi-User NOMA in 5G Mobile Communication Systems**: Two-stage user selection algorithm is proposed based on proportional fairness for downlink NOMA with zero-forcing beamforming (PF-NOMA-ZFBF) to improve the throughput-fairness trade-off for NOMA system. (Funded by **Research Management Centre _UPM**)

- **Characterization of Bio-inspired 'Tongue Clicks' Signal for Radar Applications**: study the characteristic of the human echo-locator waveform 'tongue click' and investigate its capability to be used for radar and sonar applications by adopting bio-inspired processing. Understanding the diversity of the waveform opens valuable insight which enables varieties of knowledge that can be converted into radar and sonar meaningful context. (**PRGS Grant**)

o Preparing research proposals to government, private, and international agencies, the successful research grants:

- FRGS: Characterization of Bio-inspired 'Tongue Clicks' Signal for Radar Applications.
- NICT, Japan: Networked ASEAN Peat Swamp Forest Communities.
- EMOSEN - Energy Efficient MIMO-Based Wireless Transmission for SWIPT-Enabled Network.
- Geran UPM: Power Allocation algorithm for Multi-User NOMA in 5G Mobile Communication Systems.

o Over 25 number of publications (As listed on pages 3 and 4) in internationally reputable journals and conferences.

o Assist in networking and creation of research collaboration with more than 12 national and international institutes.

Research Associate   June 2015- May 2016
Universiti Putra Malaysia (UPM)   Serdang, Malaysia
Research Centre of Excellence for Wireless and Photonics Network (WiPNET)

As a research associate, I was involved in developing and designing a new sensing prototype for blind people.
The technical aspects are:

o Preparing research proposals to government, private and international agencies.
o Analysing the tongue click signal and investigate it is feasibility to be used as a sensing waveform.
o Designing the sensing prototype for detecting the surrounding objects.
o Developing a new signal processing algorithm to be used for the tongue click sensing prototype.
o Modifying the prototype to be used for Internet of Things (IoT) applications.

Associate Lecturer and lab demonstrator (part-time)   2009-2014
Universiti Putra Malaysia (UPM)   Serdang, Malaysia
As a postgraduate research assistant, I was involved in the following activities:

- Teaching lectures and practical labs (mobile and cellular communication, microwave engineering, data network, electromagnetic theory, DSP).
- Developing learning materials and lab experiments.
- Admin work such as monitoring funded projects, tracking progress and issuing reports.

Researcher   Sep 2008-2010
MIMOS Berhad   Kuala Lumpur, Malaysia
I have been involved in MIMOS WiWi (WiFi-WiMAX) Collaboration project. In particular, I was involved in the following activities:

- Developing MAC layer protocols for WiWi product.
- Performing experiments/testings and performance evaluation through simulation.
- Providing technical recommendations and propose solutions.

IT Instructor   Nov 2006- Aug 2008

Alyamon Secondary Boys School   Jenin, Palestine

I was involved in teaching secondary school students; I have achieved the following:
- Introduced new learning tools and techniques to the students using new and smart technologies.
- Conducted several technological workshops and training courses outside the school curriculum.
- Founded the ICT club where students can utilise and learn new technology.

ICT Trainer   Aug 2006- Sep 2007

Hassib Sabbagh Information Technology Centre of Excellence,

Arab American University-Jenin (AAUJ)   Palestine

I have conducted the ICDL training course to tertiary level students

Social Information Technology Centre Director   Jul 2005- Jul 2008

United Nation Development Program (UNDP)   Palestine

I was in charge of handling all activities in Sharek centre IT Unit, under the United Nations Volunteers program. During this period the followings are some of the main responsibilities:
- Conducting ICT training programs and IT services for the community
- Planning, organizing and controlling all activities in the training centre.
- Providing IT technical support and administrative services to the branch office.
- Providing ICT training courses to the social community such as (Windows, ICDL, Visual Basic, Matlab, C++, and Internet)

PUBLICATIONS

Journals (ISI Indexed):

[1] Mohanad Mohammed, A. Sali, Sumaya Dhari Awad, **Asem Ahmad Salah**, NK bt Noordin, SJ Hashim, Keivan Navaie and Chee Yen Leow. " Interference Cancellation via D2D CSI Sharing for MU-MISO-NOMA System with Limited Feedback" IEEE Transactions on Vehicular Technology (2021). **Impact Factor 5.379 (Q1)**. *AAUP Affiliation*

[2] Messadi, Oussama, Aduwati Sali, Vahid Khodamoradi, **Asem A. Salah**, Gaofeng Pan, Shaiful J. Hashim, and Nor K. Noordin. "Optimal Relay Selection Scheme with Multiantenna Power Beacon for Wireless-Powered Cooperation Communication Networks." Sensors 21, no. 1 (2021): 14. **Impact Factor 4.19 (Q1).** *AAUP Affiliation*

[3] Khodamoradi, Vahid, Aduwati Sali, Oussama Messadi, **Asem A. Salah**, Mohanad M. Al-Wani, Borhanuddin Mohd Ali, and Raja Syamsul Azmir Raja Abdullah. "Optimal Energy Efficiency Based Power Adaptation for Downlink Multi-Cell Massive MIMO Systems." IEEE Access 8 (2020): 203237-203251. **Impact Factor 3.745 (Q1)**. *AAUP Affiliation*

[4] Raja Abdullah, Raja Syamsul Azmir, Surajo Alhaji Musa, Nur Emileen Abdul Rashid, Aduwati Sali, **Asem Ahmad Salah**, and Alyani Ismail. "Passive forward-scattering radar using digital video broadcasting satellite signal for drone detection." *Remote Sensing* 12, no. 18 (2020): 3075. **Impact Factor   4.509 (Q1)**. *AAUP Affiliation*

[5] Raja Syamsul Azmir Raja Abdullah *, Surajo Alhaji Musa, Nur Emileen Abdul Rashid, Aduwati Sali, **Asem Ahmad Salah**, Alyani Ismail "Passive Forward Scattering Radar using Digital Video Broadcasting Satellite Signal for Drone Detection" Remote Sensing, **Impact Factor 3.036 (Q1)**.

[6] **Asem Ahmad Salah**, Ali Ahmad Alnaeb, Abdullah, RSA Raja, A. Sali, NE Abd Rashid, and I. P. Ibrahim. " Micro-Doppler Estimation and Analysis of Slow Moving Objects in Forward Scattering Radar System" Remote Sensing 9, no. 7 (2017) 699. DOI: 10.3390/rs9070699. **Impact Factor 3.036 (Q1)**.

[7] **A. A. Salah**, Abdullah, RSA Raja, A. A. Alnaeb, A. Sali, NE Abd Rashid, and I. P. Ibrahim. "Micro-Doppler detection in forward scattering radar: theoretical analysis and experiment." Electronics Letters (2017). DOI: 10.1049/el.2016.4163. **Impact Factor 0.845 (Q3)**.

[8] **Asem Ahmad Salah**, Raja Abdullah, Raja Syamsul Azmir, Azizi Mohd Ali, Mohd Fadlee A. Rasid, Nur Emileen Abdul Rashid, and Aris Munawar. "Joint Time-Frequency Signal Processing Scheme in Forward Scattering Radar with a Rotational Transmitter." Remote Sensing 8, no. 12 (2016): 1028. DOI: 10.3390/rs8121028, **Impact Factor 3.036 (Q1)**.

[9] **A. Ahmad Salah**, R. Raja Abdullah, N. Abdul Aziz, N. Abdul Rashid, and F. Hashim, "Analysis on Target Detection and Classification in LTE Based Passive Forward Scattering Radar," Sensors, vol. 16, p. 1607, 2016. DOI: 10.3390/s16101607. **Impact Factor 2.033 (Q1)**.

[10] **Asem A. Salah**, Abdullah Raja Syamsul Azmir Raja, Alyani Ismail, Fazirul Hisham Hashim, Nur Emileen Abdul Rashid, and Nor Hafizah Abdul Aziz. "Experimental investigation on target detection and tracking in passive radar using long-term evolution signal." IET Radar, Sonar & Navigation. 09/2015; DOI: 10.1049/iet-rsn.2015.0346. **Impact Factor 1.135 (Q2)**.

[11] **Asem A. Salah**, RSA Raja Abdullah, A. Ismail, F. Hashim, and NH Abdul Aziz. "Experimental study of LTE signals as illuminators of opportunity for passive bistatic radar applications." Electronics Letters 03/2014; 50(7):545-547. DOI: 10.1049/el.2014.0237. **Impact Factor 1.068 (Q3)**.

[12] **Asem Ahmad Salah**, Abdullah, Raja Syamsul Azmir Raja, Alyani Ismail, Fazirulhisyam Hashim, Nur Emileen Abdul Rashid, and Noor Hafizah Abdul Aziz. "LTE-Based Passive Bistatic Radar System for Detection of Ground-Moving Targets." *ETRI Journal* 38, no. 2 (2016): 302-313. DOI: org/10.4218/etrij.16.0115.0228. **Impact Factor 0.771 (Q3).**

[13] **Asem A. Saleh**, Mohammadpoor, Mojtaba, Rsa Raja Abdullah and Mohanad Dawood Al-Dabbagh. "A Bistatic Linear Frequency Modulated Radar for On-the-Ground Object Detection." Electromagnetics 02/2013; 33(2):153-177. DOI:10.1080/02726343.2013.756295. **Impact Factor 0.765 (Q3).**

[14] **Asem A. Salah**, RSA Raja Abdullah, Borhanuddin Mohd. Ali and Nidhal Odeh "A Low Complexity Resource Allocation Algorithm for OFDMA Cooperative Relay Networks with Fairness and QoS Guaranteed" IEICE Transaction of Communication 08/2011; 94-B(8):2328-2337. DOI:10.1587/transcom.E94.B.2328. **Impact Factor 0.36 (Q4)**.

Journals (Non-ISI):

[15] Surajo Alhaji Musa, Raja Syamsul Azmir Raja Abdullah, Aduwati Sali, Alyani Ismail, Nur Emileen Abdul Rashid, Idnin Pasya Ibrahim and **Asem Ahmad Salah** " A Review of Copter Drone Detection Using Radar Systems " Technical Bulletin S & T Defence Volume 12 No. 1/2019 (**Scopus Q2**).

[16] **Asem Ahmad Salah**, Ali Ahmad Alnaeb, RSA Raja Abdullah, A. Sali, NE Abd Rashid, and I. P. Ibrahim. "Forward Scattering Radar for the Real-Time Detection of Human Activities and Fall Events Classification" Defence S&T Technical Bulletin (**Scopus Q2**).

[17] **Asem Ahmad Salah**, Raja Abdullah Raja Syamsul Azmir, and Nur Emileen Abdul Rashid. "Moving Target Detection by Using New LTE-Based Passive Radar." Progress in Electromagnetics Research B 01/2015; 63:145-160. DOI: 10.2528/PIERB15070901. **Indexed in Elsevier's SCOPUS, SJR indicator 0.4 (Q2)**

[18] **Asem A. Salah**, R. S. A. Abdullah, NH Abdul Aziz, "RCS analysis on different targets and bistatic angle using LTE frequency". International Journal of Industrial Electronics and Electrical Engineering, Volume-3, Issue-7, July-2015. **JIFACTOR (2.5).**

Proceeding:

[1] **Asem Ahmad Salah**, RSA Raja Abdullah, A. Sali, NE Abd Rashid, and I. P. Ibrahim. " Detection and classification Real-Time of Fall Events from the Daily Activities of Human Using Forward Scattering Radar " International Radar Symposium, **IRS 2019**, 26 - 28 June 2019, ULM, Germany.

[2] **Asem Ahmad Salah**, Vahid Khodamoradi, A. Sali, RSA Raja Abdullah and Borhanuddin Mohd. Ali. "Modeling of Energy-Efficient Base Station Transmission Power for 5G Massive MIMO Systems " IEEE 89th Vehicular Technology Conference, **VTC2019,** Kuala Lumpur, Malaysia, 28 April - 1 May 2019.

[3] **Asem Ahmad Salah**, Mohanad Mohammed, A. Sali, NK bt Noordin, SJ Hashim, Keivan Navaie and Chee Yen Leow. " On Short Term Fairness and Throughput of User Clustering for Downlink Non-Orthogonal Multiple Access System" IEEE 89th Vehicular Technology Conference, **VTC2019**, Kuala Lumpur, Malaysia, 28 April - 1 May 2019.

[4] **Asem Ahmad Salah**, Ali Ahmad Alnaeb, RSA Raja Abdullah, A. Sali, NE Abd Rashid, and I. P. Ibrahim. " *Forward Scattering Radar for the Real-Time Detection of Human Activities and Fall Events Classification*" 4th International Conference on Defence & Security Technology, **DSTC2018**, Putrajaya, Malaysia, 21 -22 November 2018.

[5] **Asem Ahmad Salah**, Ali Ahmad Alnaeb, RSA Raja Abdullah, A. Sali, NE Abd Rashid, and I. P. Ibrahim. " *Human Activities Detection and Classification Based on Micro-Doppler Signatures near the Baseline of Forward Scattering Radar*" International Conference on Radar, **Radar2018**, Brisbane, Australia, 27 -30 August 2018.

[6] **Asem Ahmad Salah**, RSA Raja Abdullah, NL Saleh, SMS Ahmad and NE Abd Rashid. "*Detection of Human Echolocator Waveform Using Gammatone Filter Processing*" In International Conference on Radar, **Radar2018**, Brisbane, Australia, 27 -30 August 2018.

[7] **Asem Ahmad Salah**, RSA Raja Abdullah, NL Saleh, SMS Ahmad and NE Abd Rashid. " *[4] Ambiguity Function Analysis of Human Echolocator Waveform by Using Gammatone Filter Processing* " In IET International Radar Conference 2018, **ICR2018**, Nanjing city, China, 17-19 Sep. 2018.

[8] **Asem A. Salah**, Abdullah RSA Raja, , NH Abdul Aziz, and NE Abdul Rasid. "*Vehicle recognition analysis in LTE based forward scattering radar*." **In *2016 IEEE Radar Conference (RadarConf)***, pp. 1-5. IEEE, 2016.

[9] **Asem A. Salah**, RSA Raja Abdullah, A. Ismail, F. Hashim, N. E. Abdul Rashid " Ground moving target detection using LTE-based passive radar." In Radar, Antenna, Microwave, Electronics, and Telecommunications (**ICRAMET), 2015** International Conference on, pp. 70-75. IEEE, 2015

[10] **Asem A. Salah**, R. S. A. Abdullah, NH Abdul Aziz, "RCS analysis on different targets and bistatic angle using LTE frequency". International Conference on Innovative Engineering Technologies (**ICIET**), Seoul, South Korea, 23 May 2015.

[11] **Asem A. Salah**, R. S. A. Abdullah, A. Ismail, F. Hashim, C. Y. Leow, M. B. Roslee, and N. E. Rashid. "Feasibility study of LTE signal as a new illuminators of opportunity for passive radar applications". In RF and Microwave Conference **(RFM), 2013** IEEE International, pp. 258-262. IEEE, 2013.

[12] **Asem A. Salah,** Borhanuddin Mohd. Ali, Ahmad Saqer and Nidhal Odeh "An Efficient Resource Allocation Algorithm for OFDMA Cooperative Relay Networks with Fairness and QoS Guaranteed", Second International Conference on Network Applications, Protocols and Services (**NetAPS2010**), Kedah, Malaysia, 2010, pp. 188-192.

Patents:

[1]   Ahmad S. M Saqer, RSA Raja Abdullah and **Asem A. Salah**, "**Scheduling Method for Multi-Hop Relay Networks**", MIMOS-UPM, Patent, IP20100006075, 20 Oct. 2010.

[2]   Borhanuddin M. Ali, **Asem A. Salah**, A. Sali, M.F.A. Rasid, and H. Mohamad " **Development of Cognitive Radio Wireless Sensor Network Node**", UPMIP, Patent, Under Submission.

Under Preparation/Draft Journals:

[1] Formulation of Deep Learning for Resource Allocation in Device-to-Device Communications, to be submitted to IEEE Wireless Communications.
[2] Energy Efficient Transmission in 5G Massive MIMO HetNet Using Stochastic Geometry", to be submitted to Energies, IF 2.26 (Q1)
[3] Elderly people observation using Micro-Doppler in Forward Scattering Radar System", to be submitted to PLOS One, IF 2.8 (Q1)

LANGUAGES

- Arabic (Native)
- English (Excellent)
- Bahasa Melayu (Basics)

SOCIAL ACTIVITIES

- Sport Activities Coordinator in UPM International Student Association 20012-2015.
- Participating in several volunteers activates like trees plantation and providing guides for the new international students.

ADDITIONAL INFORMATION

- Ability to work under pressure.
- Good teamwork spirit.

Referees

- **Dr. Tareq Faisal Abed Zanoon**

   Head,
   Department of Computer System Engineering.
   Faculty of Engineering and Information Technology.
   Arab American University, Palestine. Jenin, West Bank, State of Palestine.
   E-mail: tareq.zanoon@aaup.edu
   Phone no. +970595055446

- **Assoc. Prof. Dr. Nasser Hamad**

   Associate Professor,
   Faculty of Engineering and Information Technology.
   Arab American University, Palestine. Jenin, West Bank, State of Palestine.
   E-mail: naser.hamad@aaup.edu
   Phone no +972 56-622-5231

- **Assoc. Prof. Ir. Dr. Chow Chee Onn**

   Head,
   Department of Electrical Engineering
   Faculty of Engineering
   University of Malaya, 50603 Kuala Lumpur, Malaysia
   E-mail: cochow@um.edu.my
   Phone no. +603-79674457

- **Prof. Ir. Ts. Dr. Raja Syamsul Azmir Raja Abdullah**

   Head,
   Department of Computer and Communication Systems Engineering
   Faculty of Engineering
   University Putra Malaysia (UPM), 43400 UPM Serdang, Selangor, Malaysia
   E-mail: r_syamsul@upm.edu.my
   Phone no. +603-8946 4347

LIST OF TAUGHT COURSES

Dr. Asem Salah

#	Course Name	Course Description	Course Level	Program	University
1	**Network Firewalls and Intrusion Detection Systems**	This course is a fast-paced examination of the specialized security field of firewalls and intrusion detection systems (IDS). The course provides more detailed background and need for firewalls and IDS, examines the various kinds of threats that may be faced by an IDS and basic designs for IDS. Specific topics to be covered include Firewall designs/architectures, configuring PIX, VPN, Host-based and Network-based IDS.	Bachelor	COMPUTER NETWORKS / MINOR INFORMATION SECURITY	Arab American University (AAUP)
2	**Computer Network Lab**	This course provides students with hands on training regarding the design, troubleshooting, modelling and valuation of computer networks. In this course, students are going to experiment in a real test-bed networking	Bachelor	Computer Systems Engineering	Arab American University (AAUP)

		3environment, and learn about network design and troubleshooting topics and tools such as: Cabling ,network addressing, Address Resolution Protocol (ARP), basic troubleshooting tools (e.g. ping, ICMP), IP routing (e,g, RIP), route discovery (e.g. traceroute), switching and many others. Students will also be introduced to the network modelling and simulation, and they will have the opportunity to build and evaluate some simple networking models using the simulation tools.			
3	Digital Logic Design	Introduction to digital systems, Number Systems and its arithmetic operations, complement, binary codes, Boolean Algebra, Binary logic gates, Simplification of a Boolean function, Karnaugh maps, Combinatorial and sequential circuit analysis, and design. Registers and counters.	Bachelor	Computer Systems Engineering	Arab American University (AAUP)

4	Digital Logic Design lab	This course covers Digital gates, simplification of Boolean functions, decoders, code converters, multiplexes, design, address and subtractors, arithmetic logic unit, design problem, sequential circuit design, counters, clock controller, 4- bit binary counter sequential detector, shift registers, "Add and Shift" binary multiplier, small project.	Bachelor	Computer Systems Engineering	Arab American University (AAUP)
5	Data Communications and Networking	communication hardware technologies including local area and longhaul network hardware, circuit and packet switching, interfaces between computer and network hardware, and performance issues.	Bachelor	Computer Systems Engineering	Arab American University (AAUP)
6	Programing 1	This course introduced the student to object-oriented programming through a study of the concepts of program specification and design, algorithm development, and coding and testing	Bachelor	Bachelor of Electrical Engineering	University of Malaya

		using a modern software development environment.			
7	Advanced Cellular and Satellite Communication	This course covers advanced topics in wireless mobile communications systems with focus on the LTE, LTE-A and the future technologies for 5G such like massive MIMO, In addition to the latest Satellite technologies.	Master	Master of Communication Engineering	UPM
8	Signals and Systems	The course presents and integrates the basic concepts for both continuous-time and discrete-time signals and systems. Signal and system representations are developed for both time and frequency domains. These representations are related through the Fourier transform and its generalizations, which are explored in detail. Filtering and filter design, modulation, and sampling for both analogue and digital systems, as well as exposition and demonstration of the basic concepts of feedback systems for both analogue and digital systems, are	Bachelor	Bachelor of Computer and Communication Systems Engineering	UPM

		discussed and illustrated.			
9	Circuit Analysis	The course covered the fundamental principles of computer networks and basic security topics, including symmetric and public key cryptography. A real and emulated switches and routers were used for practical labs	Bachelor	Bachelor of Computer and Communication Systems Engineering	UPM
10	Computer Network laboratory	The course covered the fundamental principles of computer networks and basic security topics, including symmetric and public key cryptography. A real and emulated switches and routers were used for practical labs.	Bachelor	Bachelor of Computer and Communication Systems Engineering	UPM
11	Digital Logic Design	The course covered the design and application of digital logic circuits, including combinational and sequential logic circuits.	Bachelor	Bachelor of Computer and Communication Systems Engineering	UPM
12	Mobile Radio and Satellite Communications	This course covers the fundamentals of wireless mobile communications systems with focus on the physical layer: the wireless channel and its characteristics, how different digital communication	Bachelor	Bachelor of Computer and Communication Systems Engineering	UPM

		systems perform in the wireless environment, what techniques can be used to mitigate the effects of the wireless channel and improve performance, and how multiple users can share the channel to communicate with a single base station			
13	Computer Network	The course covered the fundamental principles of computer networks and basic security topics, including symmetric and public key cryptography. A real and emulated switches and routers were used for practical labs.	Bachelor	Bachelor of Computer and Communication Systems Engineering	UPM
14	C++	This course introduced the student to object-oriented programming through a study of the concepts of program specification and design, algorithm development, and coding and testing using a modern software development environment.	Bachelor	Bachelor of Computer and Communication Systems Engineering	UPM

RESEARCH AND CONSULTANCY

Dr. Asem Salah

	Ongoing Projects					
	Projects in UM					
#	Project Title	Funded by	Collaborators	Period	Aims	Outputs
	Optimisation of Biogas Production from Palm Oil Mill Effluent (POME) using IR4.0 for Positioning as a Higher Value Renewable Energy (RE) Resource in Malaysia.	IIRG	INTERDISCIPLINARY/UM	Nov 219 - Nov 2021	In this project, we aim to propose a range of 'smart solutions' based on IR 4.0 to optimise methane and electricity production for the biogas generator plant and to develop a policy to improve the perception of adopting IR 4.0 principles. Among the objectives are: -To design a self-powered sensor platform to detect the presence of key compounds in the POME lagoon. -To integrate communication abilities within the sensor platform. -To develop a machine learning algorithm that can optimize the methane yield at the digester tanks.	In Progress
1	Deep Learning for Device-To-Device Communications in 5G Networks	GPF, UM	UM	Aug 2018 - Jul 2020	Investigating the smart resource allocation paradigms with the adoption of the data analytics and the role of Deep Learning methods in making the system intelligent regarding being self-aware, self-adaptive, proactive and prescriptive.	In Progress

#	Project Title	Funded by	Collaborators	Period	Aims	Outputs
					i To investigate the use of deep learning methods for optimizing the management of device-to-device communication in the next generation 5G network ii. To investigate the application of deep learning methods for big mobile data analytics iii. To compare the performance of the proposed model with the conventional ones.	
Submitted Proposals for Research Grants						
#	Project Title	Funded by	Collaborators	Period	Aims	Outputs
1	A Fundamental Study on Deep Learning Algorithm for Multi-cell Device-To-Device Communications in 5G Networks.	FRGS	FKUM	2019-2021	• To formulate the resource allocation problem by considering D2D communications for the multi-cell scenario. • To investigate the use of deep learning methods for optimizing the management of device-to-device communication in the next-generation 5G network. • To evaluate the application of deep learning methods for big mobile data analytics • To examine the performance of the proposed mechanism through extensive comparison studies.	
2	Smart and Sustainable Manufacturing	IIRG	Interdisciplinary Project	2019-2021	This project will focus on developing smart and sustainable	

	Strategies of Thermoelectric Self-Charging Storage Module Based on IR 4.0 Principles				manufacturing strategies for the commercial production of the solar thermoelectric self-charging storage device. The 'smart' element derives from IR 4.0 principles which will govern the manufacturing choices. The 'sustainable' element will be based on Life Cycle Analysis methodology to ensure that the manufacturing processes selected are indeed sustainable. "Smart" manufacturing under the flagship of industry 4.0 (IR4.0), where cyber-physical systems are used in conjunction with communication nodes, sensors, and controllers to form an optimized manufacturing protocol that aims to increase production at a reduced cost and can respond to the real-time needs of the market.	
3	Machine Learning Techniques for Optimization of Biogas Production from Palm Oil Mill Effluent.	TRGS	Transdisciplinary Project	2019-2022	In this project, a strategy to increase productivity and reduce costs of electricity generation from POME is proposed on the pillars of IR 4.0: smart sensors, internet-of-things and cognitive computing using Machine Learning for big data analytics. It is expected that improvements in the electricity production capability from	

#	Project Title	Funded by	Collaborators	Period	Aims	Outputs
					POME translates into an increase in efficiency, thus translating significant cost savings and higher sustainability.	
4	IoT Deployment for Peatland Forest Management and Monitoring.	TRGS	collaboration project with UPM	2019-2022	We propose an IoT-based solution for peat swamp forest monitoring, targeting the environmental and agricultural issues and at the same time engaging with the peat swamp forest communities for social innovation aspects, with the following objectives: • Technological innovation: to deploy, analyse and disseminate information using an IoT-based peat swamp forest monitoring system, especially on sustainability, • Social innovation: to conduct social programs for peat swamp forest communities such as educational and entrepreneurship events related to the peat swamp forest.	

Collaboration Projects with UPM						
#	Project Title	Funded by	Collaborators	Period	Aims	Outputs
1	Advancing the state of the art of MIMO: the key to the successful evolution of wireless networks. (ATOM)	European Commission (HORIZON 2020)	• Lancaster University, UK • University Of York, UK • University Of Cyprus, Cyprus • UPM, Malaysia • UTM, Malaysia • Comsats Institute Of Information Technology, Pakistan • University of Peradeniya, Sri Lanka	Feb 2016 – Jan 2020	provide a framework of advanced MIMO solutions for realizing green, secure and high data throughput wireless communications	2 Proceedings have been accepted in VTC2019 2 journal papers have been Submitted

2	Networked ASEAN Peat Swamp Forest Communities	National Institute of Information and Communications Technology (NICT), Japan	• UPM, Malaysia • MIMOS Berhad, Malaysia • Posts and Telecommunications Institute of Technology (PTIT), Vietnam. • Universiti Teknologi Brunei (UTB), Brunei. • Bogor Agricultural University, Indonesia	Jul 2018 - Aug 2020	Develop an IoT-based solution for peat swamp forest monitoring, targeting the environmental and agricultural issues by deploying, analysing, and disseminating information using an IoT-based peat-swamp forest monitoring system, especially on sustainability. And at the same time engaging with the peat swamp forest communities for social innovation aspects.	• In progress
3	Development of Cognitive Radio Wireless Sensor Network Node	PRGS, MOE	UPM	Jul 2017 - June 2019	Developing a prototype uses the Reinforcement Learning -based spectrum-aware clustering algorithm that allows a member node to learn the energy and cooperative sensing costs for neighbouring clusters to achieve an optimal solution. Then use Reinforcement Learning-based clustered Cooperative Channel Sensing algorithm that learns channels' dynamic behaviours in terms of channel availability, sensing energy cost, and channel impairment to achieve optimal sensing sequence and optimal set of channels.	1 patent Submitted to UPMIP
4	Power Allocation algorithm for Multi-User NOMA in 5G Mobile Communication Systems (Funded	RMC, UPM	UPM	Jul 2018 - June 2020	The two-stage user selection algorithm is proposed based on proportional fairness for downlink NOMA with zero-forcing	1 Journal Submitted

	by Research Management Centre _UPM)				beamforming (PF-NOMA-ZFBF) in order to improve the throughput-fairness trade-off for NOMA system.	
5	Characterization of Bio-inspired 'Tongue Clicks' Signal for Radar Applications:	FRGS	UPM	Jan 2019 - Dec 2020	Study the characteristic of the human echo-locator waveform 'tongue click' and investigate its capability to be used for radar and sonar applications by adopting bio-inspired processing. Understanding the diversity of the waveform opens valuable insight which enables varieties of knowledge that can be converted into radar and sonar meaningful context.	2 Conference papers published 1 Journal Published
	Completed Projects					
1	Elderly People Observation using Micro-Doppler in Forward Scattering Radar System	FRGS, MOE	• UPM, Malaysia • UITM, Malaysia	Aug 2016 - June 2018	Developing a new approach to detect and monitor the elderly people's activities and fall events by using the Forward Scattering Radar system, as a main device Doppler sensing distinguishing features of fall events from non-fall activities. The joint time-frequency representations are used for detection, while the support vector machine, has been utilized in the classification process.	3 Journals Published 1 Journal Submitted 2 Conference published
2	LTE-Based Passive Radar for Ground Moving Target Detection	FRGS	UPM	PhD 2012-2015		6 Papers published

#	Project Title	Funded by	Collaborators	Period	Note	Status
3	Resource Allocation for OFDMA Cooperative Relay Networks		UPM	Master 2008-2011		2 Papers Published

Approved Research Grants						
#	Project Title	Funded by	Collaborators	Period	Note	Status
	Optimisation of Biogas Production from Palm Oil Mill Effluent (POME) using IR4.0 for Positioning as a Higher Value Renewable Energy (RE) Resource in Malaysia.	IIRG	Interdisciplinary	Nov 2019 – nov 2021		Approved
1	Characterization of Bio-inspired 'Tongue Clicks' Signal for Radar Applications	FRGS	UPM, UITM	Jan 2019 - Dec 2020		Approved
2	Networked ASEAN Peat Swamp Forest Communities	NICT (ASEAN IVO)	• UPM, Malaysia • MIMOS Berhad, Malaysia • Posts and Telecommunications Institute of Technology (PTIT), Vietnam. • Universiti Teknologi Brunei (UTB), Brunei. • Bogor Agricultural University, Indonesia	Jul 2018 - June 2020		Approved
3	EMOSEN - Energy Efficient MIMO-Based Wireless Transmission for SWIPT-Enabled Network	RMC, UPM	UPM	Jul 2018 - June 2020		Approved