

## Awni Itradat, Ph.D

Professor,

### **Vice President for financial and Administration Affairs**

Former Dean of Engineering

Former Director of ICET Center

Former Chairman ICT Council HU

Former Chairman CPE Dept.

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### **Teaching and Learning Philosophy:**

I, strongly, believe that all students have the ability to be successful; they simply need to tap their potential. Thus, I expect excellence from every student that steps into my classroom and in return. I bring a lot of energy to my class. If I can't get excited about my subject, why should my students? I strive to provide quality teaching through my lectures and related materials. When students become motivated, they become active learners, and the instructor becomes just another resource in the students' quest for learning. My teaching philosophy is focused on maintaining and promoting an active learning environment in the classroom.

### **Research Philosophy:**

Research is an integral part of my academic experience and career aims. It enhances my personal knowledge base and adds to the general understanding of complex subjects. My research spans across various disciplines and attempts to forge connections between them. The many years of experience provides me with the means for solving the problem, setting procedure for accomplishing the solution, and defining evaluation criteria to assess the produced solution. It is also critical for me to keep myself updated on similar research, and to identify the weaknesses and strengths of related industrial products.

### **Administrative and Leadership Philosophy:**

Being an administrator allows one to be: A Visionary, A Collaborator, An Advocate, A Facilitator, A Role Model and Mentor, An Innovator, A Researcher, and A Scholar. A good administrator is one that is able to maintain close ties with his/her staff, while at the same time capable of representing them well up the chain of command. An effective administrator has to have a clear vision of the unit's future. More importantly he/she should be able to get others to believe in that vision. Furthermore, leadership consists of painting pictures of the future for the people of the institution, listening to responses, and helping them choose which pictures are the best for the institution.

### **RESEARCH INTERESTS**

- General research areas are computing and network architectures and systems, microprocessor based system.

- high-level synthesis of 3D- and 2D-IC, parallel architectures, Quality assurance. Research interests include scheduling and resource allocation, reconfigurable computing, ASIC and VLSI synthesis, microprocessors and microcontrollers, Network on chip, and network and information systems.
- Emerging technologies and Optimization methods: Applying emerging technologies such as machine learning and optimization methods such as stochastic model predictive control and genetic algorithm to optimally simulate network loads and design protection systems for micro and smart grid and different engineering problems.
- Cyber-Physical Threats: evaluating the resilience of the power and smart grids under cyber-physical threats. This will help to develop a more robust smart grid system and improves the security requirements, protocols, architectures and response of the system to ongoing attacks.

## ACADEMIC QUALIFICATIONS

- A Ph.D in Electrical and Computer Engineering, Concordia University, Canada, 2008.

Thesis title: Interconnect-aware scheduling and resource allocation for high-level synthesis

- Master of Applied Science in Electrical and Computer Engineering, Concordia University, Canada, 2004.

Thesis title: A fuzzy logic based approach for high-level synthesis of DSP data-flow graphs onto multiprocessor systems

- Bachelor of Electrical and Computer Engineering, Jordan University of Science and Technology; Irbid, Jordan, 2000.

## Administrative Appointments:

- 2023- to date, **Vice President** of Hashemite University for financial and administration affairs.
- 2020- to 2023, **Dean of Engineering**, Hashemite University.
- 2016-2018, **Dean of Engineering**, Hashemite University.
- 2016-2023, **ABET and NAAB coordinator of HU Engineering.**

- 2016-to-2019, **Chairman of ICT council at HU.**
- 2012-to-2016, **Director of Information, Communication and E-learning Center**, Hashemite University, Jordan: Planning and supervising all operations of the ICET center.
- 2010-2012, **Director of Computer Center**, Hashemite University, Jordan: Planning and supervising all operations of the computer center.
- 2009-to-2010, **Chair of the Department of Computer Engineering**, Hashemite University, Jordan: Planning and supervising all academic, research, and Community Service of the department, leading in curriculum development, performing administrative work.
- Feb.-2019- to date, **Professor**, Department of Computer Engineering, Hashemite University, Jordan.
- Feb.-2014, **Associate Professor**, Department of Computer Engineering, Hashemite University, Jordan.
- Feb-2009, **Assistant Professor**, Department of Computer Engineering, Hashemite University, Jordan.
- 2002-2008, **Research assistant** at Dept. of Electrical and Computer Engineering at Concordia University, Canada.
- 2004-2008, VLSI Research Coordinator, Dept. of Electrical and Computer Engineering at Concordia University, Canada.
- 2000-2001, IT Faculty Representative to the Computer and Information Center, Jordan University of Science and Technology, Jordan.
- Jan 2001 – Dec 2001, Lab-Instructor at the Department of Computer Engineering – Jordan University of Science and Technology, teaching Micro-system Lab, Maintenance Lab, microprocessor and their applications, computer organization
- Sept 2000 – Dec 2000, Lab-Engineer in Yarmouk University "Al-hejjawi Faculty" (digital labs, programming), Jordan.

## Core Qualifications:

- Published several articles in notable international journalism proceedings.
- Create a dynamic culture that inspires innovation, creativity, intellectual curiosity and excellence.
- Significant experience as a senior executive in a higher education, Recourses Management and allocation, and ICT development.
- Lead the visioning process, development, and implementation of strategic plan.
- Motivate faculty, staff, and students to build an intellectually engaged community that will advance knowledge, research, and service.
- Directing and/or contributing to most Mega projects the Hashemite University during the last 10 years.
- Familiar with a wide variety of financing and revenue generating techniques.

## Professional Experiences

### Academic Committees

Committee Name/Tasks	Position
Strategic planning Committee	Chair and Member
Committee for the equivalence and accreditation of foreign certificates in the Jordanian Ministry of Higher Education	Member
Modification of “the Regulation for Awarding the BSc Degree” the HashemiteUniversity	Chair and Member
Curriculums Main Committees	Chair and Member
Appointment and Promotion Committee	Member
Dean of Engineering	Dean
University World Academic Ranking Committee	Chair and Member
ABET Accreditation Committee	Chair
NAAB Accreditation Committee	Chair
Review of Appointment Regulations for University Sponsored Students	Chair and Member
Graduate Preparation for the Workplace	Member
Scientific Production Regulation and methodology for Humanity Colleges on Campus	Member
University World Ranking Committee	Chair and Member
Committee to decide on students’ academic issues	Chair and Member

Student Affairs Committee for modifying graduation requirements	Member
Committee for Reviewing Tenure ship Regulations	Chair and Member
Committee for the Establishment of a Patent and Trademark Office at HU	Member
Committee for the Analysis of the results student accreditation test	Member
Committee for the feasibility of the inception 2nd summer semester	Member
Committee for re-evaluation of the grading scale adopted at the university(from GPA to percentage)	Member
Committee for the inception of a new course on "Entrepreneurship" to be a university required course	Member
Faculty of Engineering	Dean
Department of Computer Engineering	Chair and Member

### Administrative Committees

Committee Name/Tasks	Position
Employee Affairs Committee	Chair
The establishment Council of dentistry faculty and related committees	Chair and Member
Public Safety and Emergency Committee	Chair and Member
Appointment and Promotion Committee	Member
Housing Committee	Member
Horizon 2020 Inclusion and Incentives Regulations for Faculty Members Committee	Member
Syrian Refugee Projects and Programs (Age group 18-24)	Member
Central Contracts Committee	Member
Central Contracts Committee	Chair
Committee for the tendering and lease of the female housing units to the private sector	Chair
Hashemite University Council	Member
University Position Categorization for the purposes of appointment and promotion of University Staff Members	Chair
Crisis Management Committee	Member
Hashemite University Vision 2020 Committee	Member
Committee to Review Requests of University Investment Tenants	Chair
Hashemite University Council	Member
Committee to Review Scholarship Awarding Criteria	Member
Committee to review Public Services Bureau Job Market Recommendations	Member
Committee of reappraisal and remuneration of the commercialized zones at the university	Chair
Committee of evaluation of commercialized zones at the university and adherence to public safety regulations	Chair
Committee on the maximization of the usage of the Liaison office in Amman	Member
Committee for Iraqi faculty members' recruitment	Member
HU Housing Committee	Member

Engineering Projects Department	Acting Director
Engineering Projects Department	Acting Director

## Engineering Projects and Project Management

Committee Name/Tasks	Position
Engineering Projects Department	Acting Chair
Establishing of a Training Pharmacy at HU	Member
Committee for Evaluation the Tender Offers for the 5MWp Photovoltaic Projects at the University	Chair
Committee on the Prioritization of the University Projects for the funding by MoHE	Member
Feasibility and Economic Study of the Offer Provided by Zain Telecom for the Establishment of a Zain Integrated Site on Campus	Chair
Committee to assess the offer by Jordan Petroleum Products Marketing Co	Member
Engineering and Economics Committee for the "Museum of Natural and Human History" Design and Technical Requirements Requirements	Chair
Committee for Construction of the Stadium at HU	Chair
University Business Plan Committee	Member
University Construction Projects and Expansion Economic and Engineering Feasibility Committee	Member
Committee for the "Museum of Natural and Human History" Inception and Scope	Member
Committee for establishing the Polytechnic College	Chair
Technical Supervision Committee for the 30kWp PV Research Project at HU	Chair
Technical Supervision Committee for the construction of the University Mosque	Member
Committee for the preliminary study, pre-design, and feasibility of establishing a Pharmaceutical Sciences Faculty Building Building	Member
Committee for the Supervision and follow up on the auxiliary construction projects on campus	Chair
Committee for ATM installation or Branch establishment for Cairo Amman Bank	member
Committee for the campus accessibility and services for the disabled students and staff	Member
Committee for the study of the feasibility of establishing a tourism village at the university campus	Member
Committee for the establishment of a Research Center at HU HU	Member
Engineering Projects Department	Acting Chair
Committee for the improvement of catering services on campus and putting the engineering plans to assure adherence	Member
Committee for the Commissioning and handover of the Medical Sciences Building	Member
Technical Committee for the Design and Construction of Water Features on Campus	Member

## External Committees

Committee Name/Tasks	Position
Industrial Research and Development Fund Executive Committee Committee	Member
Committee for the equivalence and accreditation of foreign certificates in the Jordanian Ministry of Higher Education	Member
Scientific Consultation Committees	
Industrial Research and Development Fund	Member
Industrial Research and Development Fund Executive Committee	Member
MoU with Ministry of Energy and Mineral Resource Energy and Mineral	Liaison Officer
Consultation Committee with ARMICO	Member
Industrial Research and Development Fund	Member
Ministry of Higher Education Committee for review of accreditation renaming requirements for Engineering Programs	Member

## Teaching Interests

During my professional career, I had the chance to be exposed to several types of teaching opportunities dealing with undergraduate to graduate as well as local and international students. I have learnt something different from each of these situations, and I have accumulated various learning experiences. My teaching philosophy is based on the following principles, which I believe form the basics of modern education:

- a. Help students discover methods for lifelong learning and develop a sense of responsibility to seek knowledge, and challenge them to think.
- b. Develop a systematic approach to problem solving. This is accomplished by equipping students with the skills and experience needed to identify, define, model, and solve problems.
- c. Instill in the students a curious mind, independent way of thinking, and the courage to explore alternative solutions.
- d. Design labs assessments that reflect real world problems to help inspire students' enthusiasm and enable them to learn and apply the theory taught in class.
- e. Develop communication and teamwork skills. I will ask my students to do joint projects, which will help them develop the ability to work with and learn from their peers.
- f. Create communication channels with students, and be very friendly and very helpful.
- g. Provide students with the knowledge necessary for their future studies and career.
- h. Explain complex concepts using intuitive examples related to real world and encourage students to focus on fundamental principles and deductive reasoning instead of simply memorizing the results.
- i. The interaction commitments between students and the teacher are very important to make teaching and learning an interesting, rich and rewarding experience for both parties.
- j. Stimulate the students through my enthusiasm and passion for the course material since I believe enthusiasm is contagious in the class.

- k. To facilitate students learning, I like to provide opportunities for reflection and feedback from students via after-class and office hour discussions, peer-to-peer feedback on assignments and learning activities, formal and informal evaluations, etc.
- l. The ultimate goal of successful teaching is to enable the students to master and to skillfully deploy the knowledge exposed to them.

## Courses Taught

Over the last 20 years, I have experienced teaching and developing courses and educational materials at many educational institutions. As a result, I have acquired extensive teaching experience at the undergraduate and graduate level. This experience has allowed me to perceive and understand the different educational needs for which I was able to implement teaching strategies and approaches. Below is a non-exhaustive list of courses I taught:

1. VLSI and ASIC Design and Synthesis
2. Computer Organization
3. Computer Architecture
4. Neural Computing and Fuzzy Logic
5. Data Communications
6. Computer Networks and Security
7. Modeling and Simulation
8. Microprocessors and Microsystems
9. Architectural Synthesis
10. Digital Logic Design
11. Mobile Computing (Graduate level)
12. Operating Systems

## TEACHING EXPERIENCE

- **2008-to-date**, teaching different courses at the Department of Computer Engineering, Hashemite University, i.e., Assembly Language, Microprocessor Based Systems, Network security, Computer Architecture and Organization, Digital logic, Computer Networks, and Digital Logic and synthesis, High level synthesis, VLSI design. Operating systems.

- **Sept. 2008 – Dec. 2008**, Teaching assistant for the **COEN417 (Microprocessors and Interfacing)**, Concordia University, Canada.
- **Jan. 2008 – Sept. 2008**, Teaching assistant for the Lab **COEN312 (Digital design)**, Concordia University.
- **Sept. 2007-Dec 2007**, Teaching assistant for the Lab **COEN417 (Microprocessors and interfacing)**, Concordia University.
- **Jan. 2007-April 2007**, Teaching assistant for the Labs **COEN311 (Computer organization)** and **COEN312 (Digital design)**, Concordia University.
- **Dec. 2006**, Teaching of the undergraduate course **COEN417 (Microprocessors and their applications)** for short-period (Replacing the instructor), Concordia University.
- **Sept. 2006-Dec. 2006**, Teaching assistant for the Labs **COEN311 (Computer organization)** and **COEN417 (Microprocessors)**. Concordia University.
- **Sept. 2005-April 2006**, Teaching fellowship, **Circuit analysis ELEC273**.
- **Sept. 2004 – Dec. 2004**, Teaching assistant for **EMAT 213 (Differential equations)** and **EMAT 233 (Advance math.)**. Concordia University
- **Jan. 2003-May 2003**, Working as Programmer on Duty (**POD**) at Dept. of Electrical and Computer Engineering at Concordia University.
- **Sept 2000 – Dec 2000**, Working as teacher assistant for digital and assembly labs, Yarmouk University, Jordan.
- **Jan 2001 – Dec 2001**, Working as teacher assistant for digital, microprocessor, electronic, and circuits labs, Jordan University of Science and Technology.

## HONORS AND AWARDS

- **October 2019**, The best prize for applied robotics solutions by Talal Abu-Ghazaleh Organization.
- **June 2015**, Best coordinating of Tempus project by EU commission of tempus organization.
- **May 2013**, Best interactive Management Information systems, Egypt (league of Arab states),
- **May 2002 – May 2009**, Research Assistantship, Concordia University, Canada.
  
- **May 2008**, Student Travel Award to attend the International Symposium of Circuits and Systems, IEEE-ISCAS 2008, School of Graduate Studies-Concordia University.
  
- **May 2007**, Selected as one of the top five papers in IEEE-ISCAS 07-The architectural synthesis track.
  
- **June 2008**, Selected to be Granted the registration fees and travel expenses in IEEE-NEWCAS 08.
  
- **Sept. 2005 – Dec. 2005**, Teaching Fellowship, Concordia University.
  
- **Jan. 2006 – May. 2006**, Teaching Fellowship, Concordia University.
  
- **2005**, Concordia International Graduate Tuition Scholarship.
  
- **2004 – 2008**, Scholarship from the Hashemite University-Jordan to complete a Ph.D. degree at Concordia University.
  
- **2004**, Partial Scholarship for International Students, Concordia University.
  
- **2003**, Partial Scholarship for International Students, Concordia University.
  
- **2001**, Distinguished leadership employee in the Jordan University of Science and Technology.

- **1995 – 1997**, Scholarship for distinguished undergraduate students from Ministry of Higher Education and Scientific Research, Jordan.
- **1999 – 2000**, Scholarship for distinguished undergraduate students from Ministry of Higher Education and Scientific Research, Jordan.

## Research

### PUBLICATIONS

### Journals

1. Alasali, F.; **Itradat, A.**; Abu Ghalyon, S.; Abudayyeh, .; El-Naily, N.; Hayajneh, A.M.; AlMajali, A. Smart Grid Resilience for Grid-Connected PV and Protection Systems under Cyber Threats. *Smart Cities* **2024**, 7, 51-77.  
<https://doi.org/10.3390/smartcities7010003>
2. **Itradat, A.**, Alasali, F.; Hayajneh, A.M.; Abu Ghalyon, S.; El-Naily, N.; AlMajali, A .; Holderbaum, W. Enhancing Resilience of Advanced Power Protection Systems in Smart Grids Against Cyber-Physical Threats. *IET Renewable Power Generation*, accepted, **2024**.
3. Alasali, F.; El-Naily, N.; Saidi, A.S.; **Itradat, A.**; Saad, S.; Holderbaum, W. An advanced dual-setting protection scheme for microgrid resilience based on nonstandard tripping characteristics of overcurrent relays. *Electric Power Systems Research* **2023**, 225, 109869,  
<https://doi.org/10.1016/j.epsr.2023.109869>.
4. Alasali, F.; Saad, S.; Saidi, A.S.; **Itradat, A.**; Holderbaum, W.; El-Naily, N.; Elkuwafi, F. Powering up microgrids: A comprehensive review of innovative and intelligent protection approaches for enhanced reliability. *Energy Reports* **2023**, 10, 1899-1924, <https://doi.org/10.1016/j.egyr.2023.08.068>.
5. Alasali, F.; El-Naily, N.; Saidi, A.S.; **Itradat, A.**; Holderbaum, W.; Mohamed, M. Highly sensitive multifunction protection coordination scheme for improved reliability of power systems with distributed generation (PVs). *IET Renewable Power Generation* **2023**, <https://doi.org/10.1049/rpg2.12820>.
6. IT Almalkawi, AH Al-Bqerat, **Awni Itradat**, JN Al-Karaki, An efficient design of 45-nm CMOS low power low noise

charge sensitive amplifier for multi-standard wireless receiver, International Journal of Electrical and Computer Engineering (IJECE) 12 (2), **2021**.

7. **Awni Itradat**, Ala'a Araishi, Farah Alzaben, Wafa Awartani, Raghad Alsurkhi, A Heuristic Technique for Architectural Realization Targeting 3D-Integrated Circuits, in International Journal of Advanced Science and Technology, Vol 29 No 3 (2020), pp. 3023- 3038, **2020**.
8. **Awni Itradat**, Abdullah Mnayyes, A scheme for identifying and correcting the network weaknesses by incorporating bandwidth measurements, in International Journal of Circuits, Systems and Signal Processing, Volume 13, 2019, pp. 520-529, 2019.
9. Alsarhan, A., **A. Itradat**, A.Y. Al-Dubai, A.Y. Zomaya and G. Min, 2018. Adaptive resource allocation and provisioning in multi-service cloud environments. IEEE Trans. Parallel Distrib. Syst., 29: 31-42, 2018.
10. **Awni Itradat**, Islam Al-Malkawi, Heba Khraismah, Nabeel Al-Masaedeh, Enas Abu AL-Zalaf, Qesmah Al-Rabbaqeen, Odai Al-Omoush, A low-cost smart microcontroller based hazardous gas detecting system suitable for camps, in the International Journal of Engineering Research and Technology, Volume 12, Number 12 (2019), pp. 22162223, 2019.
11. Alshareet, O., **Itradat, A.**, Doush, I. A., & Quttoum, A. *Incorporation of ISO 25010 with machine learning to develop a novel quality in use prediction system (QiUPS). International Journal of System Assurance Engineering and Management, 9(2), 344–353, 2018.*
12. Alshareet, O., **Itradat, A.**, Doush, I. A., & Quttoum, A. (2016). A NOVEL SOFTWARE QUALITY PREDICTION SYSTEM BASED ON INCORPORATING ISO 9126 WITH MACHINE LEARNING. Journal of Theoretical & Applied Information Technology, 94(2), 283-293, 2016.
14. **Awni Itradat**, Mohammad Hammoudeh, Talal AlKhawaldeh, Ahmad Ismail, Mohammad Al-Shorofat, A Microcontroller-Based Light Intensity Adjustment of a Classroom Taking into Consideration the Distribution of People, in International Journal of Engineering and Advanced Technology, Volume-9 Issue-3, pp. 2513-2522,

15. Gharaibeh KM, Kaylani H, Murphy N, Brennan C, **Itradat A**, Al-Bataineh M, Aloqlah M, Salhie L, Altarazi S, Rawashdeh N, del Carmen Bas Cerdá M. A Masters Programme in telecommunications management–demand-based curriculum design. *European Journal of Engineering Education*. 2015 May 4;40(3):267-84.
16. Aljarrah, Mohammad, Suleiman Obeidat, Rami Hikmat Fouad, Mahmoud Rababah, Ahmad Almagableh, and **Awni Itradat**. "Thermodynamic calculations of the Mn–Sn, Mn–Sr and Mg–Mn–{Sn, Sr} systems." *IET Science, Measurement & Technology* 9, no. 6 (2015): 681-692.
17. **Itradat** , S. Sultan , M. Al-Junaidi , R. Qaffaf , F. Mashal, and F. Daas, "Developing an ISO27001 Information Security Management System for an Educational Institute: Hashemite University as a case study, " *Jordan Journal of Mechanical and Industrial Engineering*, Vol. 8, no. 2, pp.102 – 118, April. 2014.
18. T. Hayajneh, BJ Mohd, **A. Itradat**, AN Quttoum "*Performance and Information Security Evaluation with Firewalls,*" *International Journal of Security and Its Applications, SERSC*, Vol. 7, No. 6, Nov. 2013. Vol.7, No.6 (2013), pp.355-372.
19. BJ Mohd, T. Hayajneh, S Abed, **A. Itradat**, "*Analysis and Modeling of FPGA Implementations of Spatial Steganography Methods,*" *Journal of Circuits, Systems and Computers, World Scientific*, Vol. 23, No. 2, Feb. 2014.
20. Ayoub Alsarhan; Ahmad Al-Khasawneh; **Awni Itradat**; Mohammad Bsoul, *Economic model for routing and spectrum management in cognitive wireless mesh network*, in *International Journal of Networking and Virtual Organisations*, 2013 Vol. 12 No. 4.
21. **Awni Itradat**, Thaier Hayajneh and Ahmad Qatoom, *Mapping of Multiple Data Flow Graphs of DSP Applications onto ASIC/Reconfigurable Architectures*, *International Journal of Science and Applied Information Technology (IJSAIT)*, Vol.2 , No.2, Pages : 35-39, 2013.
22. Mahmoud A. Smadi, Qasem Abu Al-Haija, **Awni H. Itradat**, *Exact Error Rate Analysis of MIMO-MRC System under Cochannel Interference and Imperfect Channel State*

*Information*, in journal *Wireless Personal Communications*, pp. 1-13, June 2014. DOI 10.1007/s11277-014-1890-0. Print ISSN 0929-6212, Online ISSN, 1572-834X, Publisher, Springer **US**.

23. Ayoub Alsarhan, Ahmad Al-Khasawneh, **Awni Itradat**, Ibrahim Obeidat, Mohammad Bsoul, *Spectrum trading for routing in a multi service cognitive mesh network* *International Journal of Mobile Network Design and Innovation* Volume 5 Issue 2, March 2013, Pages 85-96.  
Inderscience Publishers Inderscience Publishers,
24. **Awni Itradat**, Sari Sultan, Maram Al-Junaidi, Rawa'a Qaffaf, Feda'a Mashal, and Fatima Daas, *Developing an ISO27001 Information Security Management System for an Educational Institute: Hashemite University as a Case Study*, in *Jordan Journal of Mechanical and Industrial Engineering (JJMIE)* Volume 8 Number 2, ISSN 1995-6665, Pages 102 – 118, Jordan, April. 2014.
25. **Awni Itradat**, *RECONFIGURABLE AND MODULAR BASED SYNTHESIS OF CYCLIC DSP DATA FLOW GRAPHS*, in *Journal of Theoretical and Applied Information Technology (JATIT)*, Asian Research Publishing Network (ARPN). Publication type: Journals. ISSN: 18173195, 19928645, 2014.
26. **Awni Itradat**, M.O. Ahmad, *Reduction of I/O Delay by Incorporation of reconfigurable Processing Units into the High Level Synthesis of DSP Applications*, *International Journal of Applied Engineering Research*, ISSN 09734562, 2014.
27. **Awni Itradat**, M.O. Ahmad, A. Shatnawi, "Interconnect-Aware Register Binding with and without Node Regeneration for High-Level Synthesis," **submitted** for possible publication, 2021
28. **Awni Itradat**, M.O. Ahmad, "Incorporating of Reconfigurable units in a Simultaneous Scheduling, Allocation, and Placement with Interprocessor Communication Delay," **submitted** for possible publication, 2021

#### **Proceeding:**

29. Al-Karaki, Jamal N; **Itradat, Awni**; Mekonen, Selam, "Immersive Cybersecurity Teaching/Training Using Gamification on the

Metaverse: A Hands-On Case Study", 2023 IEEE Intl Conf on Cyber Science and Technology Congress (**IEEE CyberSciTech 2023**).

30. **Awni Itradat** and Ashraf Bqerat. "A Hybrid Scheme for Minimizing Leakage Current in CMOS-Based Architectures by Employing Multiple Supply Voltages and Power Gating Techniques." In *2018 2nd European Conference on Electrical Engineering and Computer Science (EECS)*, pp. 100-104. **IEEE, 2018**.
31. **Awni Itradat**, Thair Hayajneh and Ahmad Qatoom, Mapping of Multiple Data Flow Graphs of DSP Applications onto ASIC/Reconfigurable Architectures, *In Proceeding of International Conference ICCTE 2013*  
39. - Held during 11-12 March, 2013, Dubai, pp.35-
32. **Awni Itradat**, Majdi Maabreh, Amar Rayyan, Abed Aljawabreh, Muaffaq Imam, Comparative Study of Internet Usage in Educational Institutes: The Jordanian Hashemite University as a Case Study, *in proceeding of International Conference on Computing Technology and Information Management (ICCTIM2014)*, The Society of Digital Information and Wireless Communication, pp. 100-107, Dubai, UAE, April 2014.
33. **A. Itradat**, M.O. Ahmad, A. Shatnawi, "Delay and sampling-rate aware architectural synthesis in presence of communication overhead," In *The 3rd International IEEE-NEWCAS 2008 Conference*, Quebec, Canada, 22-25 June 2008, Page(s): 323 – 326.
34. **A. Itradat**, M.O. Ahmad, A. Shatnawi, "Minimization of I/O delay in the architectural synthesis of DSP data flow graphs," in *the IEEE International Symposium on Circuits and Systems. ISCAS 2008*, Seattle, USA, May 18-21, 2008, pp. 205 - 208.
35. **A. Itradat**, M.O. Ahmad, A. Shatnawi, "Architectural synthesis of DSP applications with dynamically reconfigurable functional units," In *the IEEE International Symposium on Circuits and Systems. ISCAS 2007*, New Orleans, USA, 27-30 May 2007, Page(s):1037 - 1040.
36. **A. Itradat**, M.O. Ahmad, A. Shatnawi, "Dynamically reconfigurable adaptable multi-module based synthesis of DSP data flow graphs," In *IEEE Canadian Conference on Electrical and Computer Engineering 2007*, CCECE 2007, Vancouver,

Canada, 22-26 April 2007, Page(s):1515 – 1518.

37. **A. Itradat**, M.O. Ahmad, A. Shatnawi, "A processor allocation of DSP applications onto heterogeneous multiprocessor architectures," In *IEEE Canadian Conference on [Electrical and Computer Engineering 2007](#)*, CCECE 2007, Vancouver, Canada, 22-26 April 2007 Page(s):944 - 947.
38. **A. Itradat**, M.O. Ahmad, A. Shatnawi, "A delay- optimal static scheduling of DSP applications mapped onto multiprocessor architectures," In *the IEEE [International Symposium on Parallel Computing in Electrical Engineering 2006](#)*, PARELEC 2006., Bialystok, Poland, 13-17 Sept. 2006, Page(s):386 – 391.
39. **A. Itradat**, M.O. Ahmad, A. Shatnawi, "Incorporation of reservation stations into the scheduling of DSP graphs onto heterogeneous multiprocessors," In *IEEE [48th Midwest Symposium on Circuits and Systems, MWSCAS 2005](#)*, 7-10 Aug. 2005, Cincinnati, USA, Vol. 1, Page(s):460 - 463.
40. **A. Itradat**, M.O. Ahmad, A. Shatnawi, "Scheduling of DSP algorithms onto heterogeneous multiprocessors with inter-processor communication," In *The 3rd International [IEEE-NEWCAS 2005 Conference](#)*, Quebec, Canada, 19-22 June 2005, Page(s):95 – 98.
41. **A. Itradat**, M.O. Ahmad, A. Shatnawi, "Scheduling of DSP data flow graphs with processing times characterized by fuzzy sets," In *Canadian Conference on [Electrical and Computer Engineering 2004](#)* , IEEE CCECE 2004, Niagara Falls, Canada, 2-5 May 2004, Vol. 3, Page(s):1245 – 1248.
42. T. Hayajneh, S. Khasawneh, BJ Mohd, **A. Itradat**, "Analyzing the Impact of Security Protocols on Wireless LAN with Multimedia Applications," In Proc. of The [Sixth International Conference on Emerging Security Information, Systems and Technologies \(SECURWARE 2012\)](#), pp. 169-175, Rome, Italy, August, 2012.
43. Mohammad S. Widyan and **Awni Itradat**, Dynamic and Steady-State Operational Performance of Hybrid Powered DC Shunt Motor via PM and PV Generators with MPPT for Pumping Applications , [International Conference on Energy, Water & Environment ICEWE](#), pp. 1-6, Jordan 2013.

### Current research projects:

#### **a. Analyzing Smart Grid Resilience Under Cyber-Physical Threats, January 2023-January 2025**

The initiative is centered on assessing the resilience of smart grids to a variety of cyber-physical threats at High Voltage (HV), Medium Voltage (MV), and Low Voltage (LV) levels. We are using simulations to study different threat scenarios and their impacts on the power protection system, particularly at HV/MV levels, while also addressing the often underappreciated threats on LV networks. The ultimate goal is to enhance the power grid's resilience at all voltage levels, leading to the development of a more robust cybersecurity strategy for the energy sector. Further information is available at <https://cyberssgridhu.github.io/>.

#### **b. Applications of Artificial Intelligence in Cybersecurity, Attacking and Defending**

The research will shed light on real-world use cases of artificial intelligence paired with security applications. AI-powered cyber-attack is expected to evolve on massive scale. Many believe that AI is already being deployed for malicious purposes by highly motivated and sophisticated attackers. As such, the opportunities for artificial intelligence (AI) automation are vast in the information security field. Frequently, AI is used to make certain defensive aspects of cyber security more wide-reaching and effective such as combating spam and detecting malware. AI can be used while attempting to attack vulnerable systems given the speed of attack. The research will also focus on employing machine learning to identify vulnerabilities and suggest fixes. The research will find ways of intersection of artificial intelligence and the security field in industry and government.

#### **c. Using machine learning to close zero-day vulnerabilities**

We will explore the use of machine learning to help close vulnerabilities, particularly zero-day threats and others that target largely unsecured IoT devices. The expected outcome is to help organizations to potentially close vulnerabilities and stop patch exploits before they result in a data breach.

#### **d. Applications of block chain in IoT Security and Privacy**

While the blockchain trend is spreading to usecases other than cryptocurrencies, it is still not clear on its implementation for IoT. We study the current state of blockchain implementations for IoT considering the available usecases, the types of implementation, the design issues and challenges to be considered while implementing. We list these gaps from various literatures that will help in providing insights into creating a secure architecture of blockchain for IoT.

#### **e. Smart and Trusted Healthcare in Jordan Using Blockchain**

We propose a novel, distributed, secure prototype system that has the potential to enable secure lifetime medical data, decentralized and shared storage, and authenticated access by using blockchain technology. We use blockchain technology to allow the creation of a shared database of health information that will greatly facilitate the process of real time access and updates without compromising security, integrity and confidentiality of patient data. Our objective is to improve quality of care and lower the cost of delivery as well as enhance medical records management and unified electronic health records at the national level in Jordan.

**f. Cloud Security: Cyber-attack classification and threat modelling over cloud systems**

This research explore finding was to classify attackers and their consequent motives of attack. During the project, I used python to collect and analyze data to classify attackers in to multiple categories. As a result, I was able to contribute towards the existing attacker models.

**g. Security threats in wireless sensor networks**

The research aims to identify security threats in wireless sensor networks (WSNs) and develop countermeasure to resolve them. WSNs have a number of vulnerabilities which might be exploited by hackers to gain access to the network to steal data or tamper with it. This research also investigates the impact of malicious attacks on routing protocols in order to secure big data privacy and protection.

**Other Skills acquired:**

Collaboration with a diverse group of researchers in a multi-cultural team. Published and presented articles in scientific conferences. Carried out case studies in a professional setting at different organizations.

**GRANTS AND FUNDS**

- **Project title:** Analyzing Smart Grid Resilience Under Cyber-Physical Threats, **January 2023-January 2025**  
Source: Ministry of Higher Education and Scientific Research - Jordan, Scientific Research and Innovation Support Fund, Budget: 132000 USD.  
Abstract: Our initiative is centered on assessing the resilience of smart grids to a variety of cyber-physical threats at High Voltage (HV), Medium Voltage (MV), and Low Voltage (LV) levels. We are using simulations to study different threat scenarios and their impacts on the power protection system, particularly at HV/MV levels, while also addressing the often underappreciated threats on LV networks. The ultimate goal is to enhance the power grid's resilience at all voltage levels, leading to the development of a more robust cybersecurity strategy for the energy sector. Further information is available at <https://cyberssgridhu.github.io/>
- **Main Researcher:** Grants from Hashemite University "a key establishment and renewal technology for grid - deployed wireless sensor" (10,000 \$). 2016
  - **Project coordinator:** Grant from Tempus "Development of An industrial oriented Master in telecom." (1 M Euro) 2011-2014

- **Project Coordinator:** Grants from Tempus "(Modernizing Undergraduate Renewable Energy Education: EU Experience for Jordan (MUREE (0.5 M Euro).2012-to date
- **Main Researcher:** Grants from Hashemite University "wireless networks security issues and jamming attacks" (50,000 \$). 2013-2014
- **Project Coordinator:** Grants from Cisco to establish a network and security research and training lab. (120,000 \$) 2011
- **Project Coordinator:** Grants from *hp* to establish a network and security research and training lab. (100,000 \$) 2014
- **Project Coordinator:** Grant from Ministry of higher education of Jordan to establish technology incubators at Hashemite University (50,000 \$) 2010
- **Main researcher:** Grant from Ministry of higher education of Jordan to establish VLSI at Hashemite University (50,000 \$) 2012-2013
- **Steering committee and co-advisor:** Grant from Arab-gulf countries to establish Hi-tech and green Class room complex at the Hashemite University (15 M \$) 2014-2015
- **Steering committee and co-advisor:** Grant from Arab-gulf countries to establish Solar Energy station (4 MW) at the Hashemite University (12 M \$) 2014-2015
- Many Other projects in different areas of my research fields

## PROFESSIONAL SERVICES

- Member of different University, Faculty, and Departmental committees at Hashemite University since 2009.
- The head of committee for different projects and studies in the Engineering Faculty and the Department of Computer Engineering, Hashemite University, since 2009

- Reviewer for several international journals and conferences. e.g. IEEE Transactions on Circuits and Systems(IEEE-TCAD) and IEEE Transaction on VLSI; IEEE Int. Symposium on Circuits and Systems (ISCAS); ACM Conf. on Compilers, Architecture, and Synthesis for Embedded Systems (CASES); ACM Transactions on Architecture and Code Optimization (TACO); IEEE Int. Conf. on Parallel Computing (IEEE-PARELEC).
- A Member in many of the establishing committees of IT faculty in JUST, 2000-2001.
- Participated in the organization of the 2<sup>nd</sup> International Arab Conference on Information Technology, 13-15 Nov. 2001, JUST.
- Chairing the Engineers section in the IT faculty of JUST, 2000 – 2001.
- Significantly contributed in the design of the Computer Engineering Labs of the IT faculty in Jordan University of Science and Technology (JUST) 2000-2001.
- Participated in several technical committees for tenders pertaining to the Computer and Information Center (ICT) infrastructure of JUST 2000-2001.
- Trainer in the computer literacy ICDL project, 2001.

## VOLUNTEER/OFFICIAL EXPERIENCE

- Member of the **Hashemite University Council** 2010-to date.
- Member of the **Faculty of Engineering Council** since 2009- to 2023.
- Chairing the **Main tender's committees** of the Hashemite university 2022-to date
- Member of the **Main tender's committee** of the Hashemite university 2013-2016, 2020-2022
- A member of many **technical, Monitoring and consulting committees for building, construction, and ICT projects** at Hashemite University.
  - Lecture Halls buildings,
  - Financial department building,
  - Buildings of computer labs.,

- Faculty of Pharmacy building,
  - 5 MW Solar Energy Project,
  - Building of Queen Rania faculty for childhood.
  - HU-Surveillance systems,
  - HU Wired and Wireless Networks,
  - HU Data Center-Infrastructure,
  - HU Disaster Recovery Center
  - Others
- A member of a committee to study the proposed agreement between the University /Center for e-learning and the British Academy e-Learning in 2009.
  - A member of the Committee for the modernization and development of information on the website of the University in 2009.
  - A member of the Committee to identify and discuss the university charges the university budget, final accounts in 2009.
  - The decision of the Commission to examine and prepare the footprint for the organization of the students enters through the gates of the university in 2008.
  - A member of the committee to examine applicants for the post of Laboratory Technician 2008.
  - The decision of the Commission to negotiate with Royal Jordanian to lease a draft Convention on the site within the campus, 2009.
  - A member of the Board of the Center for e-learning at the university in 2009.
  - Member of the Board of the Center for Academic Quality Assurance in 2009.
  - A member of the Council of the status of languages in the university in 2009
  - Council member of the Computer Center in 2009.

- A member of a committee to study the specifications of the various bids before being submitted to the Central Tenders Committee.
- A member of a committee to study the names of the functional status of e-learning and the exchange rate of a financial reward for these titles in 2009.
- A member of the committee to look into the memorandum of understanding signed between the university and the project management operation of community colleges in the Kingdom of Saudi Arabia in 2012.
- Committee for the academic guidance of students.
- Committee for the receipt of a medical college and financial affairs buildings.
- The Commission of receipt of the wing of a College of Medicine.
- Regulatory Commission and receive the guests and students on scientific fifth.
- Committee for the formation of the Center to ensure academic quality.
- Efficiency of the Committee in the Faculty of Engineering.
- Commission on the strategic plan 2009-to date.
- A committee to study the report advocates for Women's Development Fund for the processing of the industry free of charge and open the Cisco Academy in the Hashemite University.

## PROFESSIONAL AFFILIATIONS

- Member of IEEE: Institute of Electrical and Electronics Engineers
- Member of IEEE Computer Society.
- Member of IEEE Circuits and Systems Society.
- Member of Jordan Engineers Association.

- Member of ACM: Association for Computing Machinery.

## MAJOR ICT PROJECTS

1. Enhancing ICT infrastructure, the Hashemite University, Zarka, Jordan.
2. Establishing Wireless Campus and Smart campus, the Hashemite University, Zarka Jordan.
3. Establishing computer engineering program, the Hashemite University, Zarka, Jordan.
4. Establishing e-learning center, the Hashemite University, Zarka Jordan.
5. Initiate "Towards e-campus", the Hashemite University, Zarka Jordan, which demands to minimize paper work gradually reaching to paper-free campus by end of 2014.
6. Establishing the disaster recovery data center for the Hashemite University.
7. Establishing the security platform for the Hashemite University.

### Languages

Fluent reading, speaking, and writing in Arabic and English. Basic French.

### Community activities

Member of many committees that serve communities in computing technology related subjects.

### Extracurricular activities

Provide Consultations for industry and government. Volunteer Work and Community Service. Judging Competitions. Evaluate research proposals. Conduct paper reviews for conferences and journals. Act in many conferences as TPC member. Organized and Co-Organized many workshops and exhibitions

### Interests and activities

Reading, writing articles for newspapers, Sports, Deep thinker, future plan development.

## REFERENCES

Available Upon Request.