

# Curriculum Vitae

## **BASSEL SOUDAN**

### **Associate Professor of Computer Engineering**

#### **WORK ADDRESS**

Dept. Of Computer Engineering  
College of Computing and Informatics  
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#### **E-MAIL ADDRESS**

#### **NATIONALITY**

United States of America

#### **SPECIALIZED EXPERIENCE**

##### **Accreditation**

Supervised the SREE Department's preparations for ABET accreditation in 2017 and current preparations for CAA accreditation. Supervised the ECE department's preparation for accreditation eligibility in 2000, accreditation in 2004 and reaccreditation in 2009. Developed and prepared the two departments' self-study documents, the statistical analysis for student data and program continuous evaluation and improvement efforts, and the full documentation needed for the accreditation committee visits. Set the standards and monitored the preparation of course files in preparation for the committee visits.

##### **Curriculum Development**

Revised and the SREE program and courses and started the development of the MSc in Energy Engineering to be offered soon by the SREE Department. During tenure as ECE department chairman, re-created the department's two programs (BSc in Computer Engineering and BSc in Electrical and Electronics Eng.) and maintained these programs until accreditation. Heavily involved in the continuous evaluation and improvement of the BSc and MSc programs in both departments.

##### **Management**

Experienced in management in industry as well as academia.  
3 years of management experience in Intel in the United States  
1 year as the first Chairman of the ECE Department  
3 years as the Director of the UOS Center for Continuing Education  
4 years as the Chairman of the SREE Department

##### **Wide Teaching Portfolio**

During the tenure at the University of Sharjah taught 18 different courses spanning the areas of Computer Architecture, Microprocessor Design, Digital Systems Design, Embedded Systems, Digital Electronics, VLSI Systems, Integrated Circuit Design, Engineering Ethics, as well as Engineering Management,. Taught courses spanning from 1<sup>st</sup> year all the way through graduate level.

Inter-Disciplinary Research	Have conducted research in the areas of Renewable Energy, Embedded Systems, Design Automation, and Information Security. Currently working on the utilization of IOT technology in the monitoring and control of renewable energy systems.
Administration	Served as a chairman or member of about 30 different committees at the levels of the University, College and Department.
Conference Organization	Significantly involved in the organization of 5 international conferences at the University of Sharjah during the period from 2002 – 2008.
Student Training	Supervised the preparation, solicitation and assignment of student practical training opportunities since 2004. Supervised students during practical training assignments (including international assignments through IAESTE) for the summers of 2004 till present.
Student Recruitment	Member of the College's and Department's Student Welfare Committees. Responsible for developing, organizing and implementation of school visits to increase high school student awareness about the importance and attractiveness of careers in Engineering.
Continuing Education	Developed and delivered training courses on IT Service Management under the ITIL v3 Foundation standard as well as IT Project Management. Attendees were staff from several professional organizations and the University's own Information and Telecommunications Center.

## **EDUCATION**

<b>Doctor of Philosophy.</b>	Electrical & Computer Engineering, December 1994 <b>Illinois Institute of Technology</b> Department of Electrical and Computer Engineering. <b>Thesis Title:</b> "MIES - A Visual Register-Transfer Description Language for the Microarchitecture of VLSI Systems"
<b>Master of Science.</b>	Electrical & Computer Engineering, May 1988 <b>Illinois Institute of Technology</b> Department of Electrical and Computer Engineering.
<b>Bachelor of Science.</b>	Electrical Engineering and Computer Science, December 1986 <b>University of Illinois at Chicago</b> Department of Electrical Engineering and Computer Science.

## **CERTIFICATIONS**

January 2008	<b>ISO 27001 Information Security Management System Implementation and Auditing.</b>
March 2008	<b>Foundation Certificate in IT Service Management - Information Technology Infrastructure Library (ITIL).</b>

## AREAS OF SPECIALIZATION

Extensive experience with **Internet of Things, Embedded Systems, Computer Architecture and Microprocessor Design, Software Development, Software Engineering and Software Architecture. Information Security Systems, VHDL and Verilog Design Languages, VLSI Design and Design Automation. Object-Oriented programming, C, and UNIX.**

## OTHER AREAS OF EXPERIENCE

Distributed Processing Systems, Real-Time Data Processing, Operating System Design, Neural Networks, and Digital Fault Detection.

## COMPUTER LANGUAGES

Object-C, C, C++, UNIX Shell Scripting, Perl, Assembly, Lisp, Scheme, FORTRAN 77, BASIC, HyperTalk, and MainSail.

## INDUSTRY EXPERIENCE

Oct. 1996 – **Senior Design Engineer.**

Sep 1999 **Intel Corporation.**

Microprocessor Group

Santa Clara Processor Division

Merced Microprocessor Design Project



**This position has afforded me excellent experiences in complex integrated circuit design, microprocessor architecture, electronic design automation, software development, software customization, user support, engineering management, and engineering supervision.**

The responsibilities include directing, training and supporting more than forty five design engineers in the design tasks required.

Also responsible for developing the necessary tool functionality for the automation of the testing and verification tasks. Developed several macros (tool extensions) that were used by the floorplan engineers of the different units to complete their required tasks according to the requirements set by the chip floorplan team. In addition, developed a breakthrough tool for verifying the unit designs against many different types of errors. The tool also ensured that the designs submitted by the units met the requirements of the full-chip floorplan team. Was responsible for declaring the achievement of “silver” and “gold” status for several units as their designs were completed and met the verification requirements.

As a member of the full-chip floorplan team, was involved in the final assembly and tape-out process. The process included integrating and assembling the designs from all the units and verifying the working relationships between the different units. Was also involved in the tedious task of connecting all of the unit designs with routing at the full-chip level. Was responsible for routing about 30% of the 100,000 nets required to connect the different units and complete the design of the chip.

Finally, was involved in the verification of the complete layout of the chip including design rule verification and interaction with the group that took over the chip manufacturing and samples testing process after tape-out.

Oct. 1994 –  
Oct. 1996

**Senior CAD Engineer.**  
**Intel Corporation.**  
Microprocessor Group  
Design Technology



This position has afforded me excellent experiences in VLSI design, software architecture development and planning, software development, software, testing, verification and validation.

Member of the Full Chip Layout Advanced Methodology Engineering team representing functionality validation.

The team's responsibilities included setting the direction and methodology for future full chip layout tool development as well as validating that the current features do support the existing methodologies.

**Technical Leader** of the Tool Validation Team.

Personally developed and executed two of six flows that were used to validate the full chip layout tool suite. Headed a team of four engineers and was responsible for the planning, scheduling, leadership, technical contribution, and successful completion and delivery of the functional Athena 2.1 full chip layout tool suite.

**Validation Team.**

Worked on validating the behavior, and interaction of the Full Chip Layout tools. The work involved simulating a real chip design environment, including floor-planning, signal planning, routing, and performance verification to prove the functionality of the tools. Was a key player in the successful delivery and installation of the Athena 2.0 system.

**Verification Team.**

Worked on establishing software engineering principles and practices for the Athena tool suite.

Participated in defining the appropriate set of software engineering principles for the Athena tool suite that took into account the complexity of the system as well as the amount of legacy code being maintained. The work involved the definition and establishment of coding standards, documentation standards, and testing standards, as well as implementing measurable and trackable maturity criteria.

**Tool Development Group.**

Worked on the maintenance as well as development of new features on Intel's main floorplanning and chip assembly tool. The tool consists of 2 million lines of code written over a 14 year period. The work involved the analysis of existing code for optimization, bug fixes, and incorporation of latest software engineering practices. It also involved the improvement of the tool's software architecture to better suit the new developments.

Worked on the migration of the tool suite from .25 micron to .18 micron manufacturing technology. This involved understanding all the issues involved in the two technologies and their differences and updating the tool suite to meet the requirements of the new technology.

### **Planning** of the Athena Tool Suite.

Worked on the evaluation and testing of Intel's previous suite of CAD tools (Zeus) as well as evaluating current market leader technologies in preparation for the development of the new Athena suite. The work involved planning, testing and execution of a test and evaluation plan. The plan called for evaluation of three market leader placement and routing solutions as well as experimenting with Intel's automated routing solution and evaluating the interaction with the TimberWolf placement program.

May 1991 –  
Aug. 1991

### **Design Engineer.** (Summer Intern). **Rich/A Reuters Company.**

Worked on the development and translation of a new real-time quote server. The work involved the porting of software that was designed for Heuricon Computers so that it would work on Sun/SPARC stations. This involved modification of existing code, software design, and implementation using the C language and the UNIX operating system.

April 1990 –  
Aug. 1990

### **Design Engineer.** (Summer Intern). **Rich/A Reuters Company.**

Worked on the testing and development of two real-time quote servers. The work involved testing of a real-time quotes server, installation manual design and the development of a universal installation script.

## **ACADEMIC EXPERIENCE**

Sep. 1999 –  
Present

### **Associate Professor of Computer Engineering** – since Jan. 2011 **Department of Electrical and Computer Engineering,** **University of Sharjah**

#### **Assistant Professor** – Sep. 1999 – Dec. 2010

Heavily involved in service at the university, college and department levels. Currently serving as the Training coordinator and the Continuous Program Improvement coordinator for the college and the department.

### **Supervision of Graduate Students**

Thiziri Hala – PhD – Ongoing – Co-Supervisor

Thesis Title Multilevel Inverter Topologies for Solar PV Systems

Fetna Dandachi – MSc – Ongoing

Thesis Title IOT Enabled Implementation of a Portable ICU Unit

Huda Tabbaa – MSc – Graduated December 2015

Thesis Title Computer-Aided Quranic Recitation Error Detection

Mohammad Nihlawi – Project based MSc – Project completed 2013

Project Title Universal Self-Learning Adaptive Stop and Go Cruise Control System

Salama Banawan – Project based MSc – Project completed 2011

Project Title E-DNA: A Mechanism based on TRNGs and PUFs for Securing FPGA-based Designs

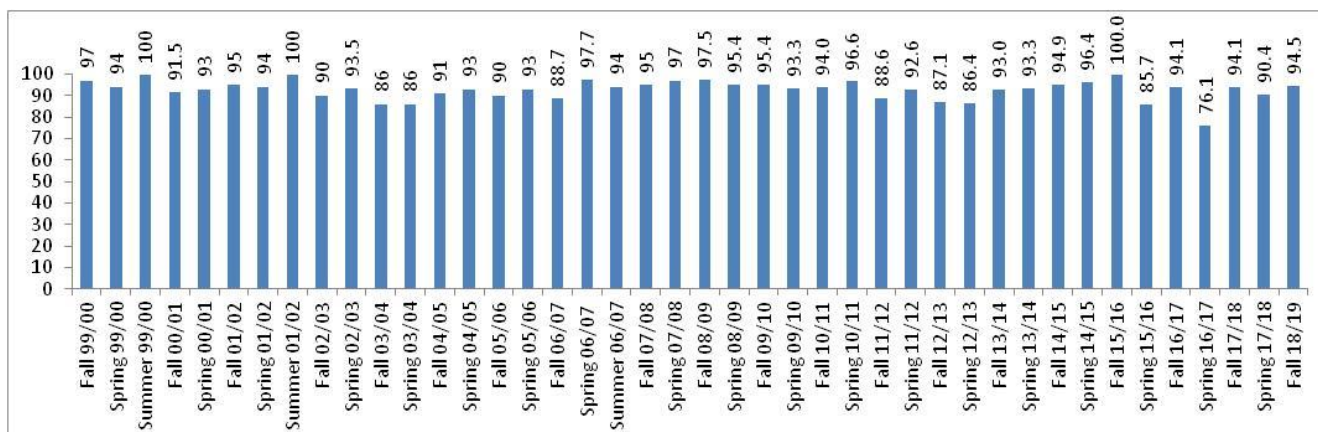
## Teaching Portfolio

Developed and taught the following courses:

- |   |                                       |
|---|---------------------------------------|
| 1. Integrated Circuit Fundamentals                        | <b>(Graduate)</b>                     |
| 2. Design of IOT Systems                                  | (4 <sup>th</sup> year Tech. Elective) |
| 3. VLSI Design  | (4 <sup>th</sup> year Tech. Elective) |
| 4. Advanced Digital Design (VHDL)                         | (4 <sup>th</sup> year Tech. Elective) |
| 5. Engineering Management                                 | (4 <sup>th</sup> year Tech. Elective) |
| 6. Embedded Systems Design                                | (3 <sup>rd</sup> year)                |
| 7. Computer Systems Architecture                          | (3 <sup>rd</sup> year)                |
| 8. Computer Systems Laboratory                            | (3 <sup>rd</sup> year)                |
| 9. Professional, Social and Ethical Issues in Engineering | (3 <sup>rd</sup> year)                |
| 10. Fundamentals of Electronics                           | (3 <sup>rd</sup> year)                |
| 11. Microcontroller Based Design                          | (2 <sup>nd</sup> year)                |
| 12. Microprocessors and Assembly Language                 | (2 <sup>nd</sup> year)                |
| 13. Digital Logic Design                                  | (2 <sup>nd</sup> year)                |
| 14. Digital Logic Design Laboratory                       | (2 <sup>nd</sup> year)                |
| 15. Circuit Analysis 1                                    | (2 <sup>nd</sup> year)                |
| 16. Introduction to Engineering                           | (1 <sup>st</sup> year)                |
| 17. Advising and Guidance                                 | (1 <sup>st</sup> year)                |

### Semester-by-semester teaching evaluations

The following graph shows average student evaluations on a semester by semester basis.



### DEANS' EVALUATIONS

- “The whole approach exemplifies what should be happening in the class room.” **Prof. T. Davies, College Dean**
- “Really impressive and virtuoso performance. I cannot imagine the material being transmitted in a more effective way.” **Prof. T. Davies, College Dean**
- “The lecture was carried out professionally and the overall performance was very good.” **Dr. N. Kallas, Acting Dean**
- “Your department and the college are very appreciative of the high quality and great attention that you devote to your courses.” **Dr. N. Kallas, Acting Dean**
- “It seems clear that students have tremendously enjoyed your courses and are appreciative of your efforts.” **Dr. N. Kallas, Acting Dean**

- “Excellent and very dedicated – Involvement in student projects supervision is recognized.” **Dr. N. Kallas, Acting Dean**
- “The student evaluations are indeed pleasing and reflect students’ appreciation of your efforts. The College is very pleased and appreciative of your dedication and commitment to teaching excellence.” **Prof. B. Bouashash, College Dean**
- “I would like to take this opportunity to thank you for the efforts that you have devoted to your courses as well as your other valuable contributions to the progress of the college of Engineering. I wish you continued success.” **Prof. B. Bouashash, College Dean**

#### **DESIGN PROJECTS SUPERVISED**

Supervised more than 20 groups of students through their successful completion of the Junior and Senior Design Project courses. The following is a non-comprehensive list:

- IOT Controlled Drone for Victim Localization using Thermal Imaging
- Autonomous Drone Guided Ground Vehicle
- IOT Controlled Autonomous Delivery Vehicle.
- Car-to-car communication system
- Autonomous fire-fighting robot.
- Multi-Touch Computer Screen
- Implementation of Triple-DES encryption/decryption system using VHDL and FPGA
- Secure communication over GSM network
- Secure Embedded Data Communication System.
- Software Engineering of a Software System for the Registration Dept.
- Distributed Sorting Algorithm.
- Wireless LAN
- Rolling Message Display
- Infra-red Remote Control and Receiver (2 implementations).
- Implementation of the DLX Control Unit Using VHDL and a CPLD.
- Implementation of the DLX ALU Using VHDL and a CPLD.
- VLSI Design and Implementation of a simple 16-bit ALU.

June 2014 –  
September 2018

#### **Chairman, Sustainable and Renewable Energy Engineering Dept. University of Sharjah**

Lead my colleagues into building a very strong department that is competing with much older and more established departments within the university and at the national level.

Grew the student body from around 200 to over 650 students. Built the staff from 4 full-time faculty to the current 15. Within the 2017/2018 academic year, Lead the colleagues into preparing for and acquiring ABET accreditation for the SREE program as well as preparing the application for accreditation by the local ministry of higher education. Developed the skeleton of the planned MSc in Energy Engineering program.

Supported the colleagues in the department in establishing one of the strongest research programs in the university as measured by publication output from the point of view of quantity and more importantly the quality of the publications.

April 2010 -  
Sept. 2013

**Acting Director, Center for Continuing Education and Professional Development, University of Sharjah**

Developed strategic plan for the expansion of the center as well as strengthening its presence as a major competitor in the market. Redirected the center towards better serving the goals and aims of the University. Performed a detailed SWOT analysis to pinpoint weaknesses and leverage the strengths to mitigate them. Developed a set of KPIs for measuring the success and identifying the failures. Supervised the delivery of more than 120 programs achieving 4 million AED of income for the university during the past two years.

Feb 2000 –  
Nov. 2000

**Chairman, Department of Electrical and Computer Engineering University of Sharjah**

The first chairman for the Department of Electrical and Computer Engineering.

Completed the organizational setup, planning and management, staffing, financing, budgetary planning and execution, procurement of large amounts of equipment from diversified international sources, facilities planning, managing customer satisfaction as well as supervision of a large team with diversified backgrounds and experience levels.

Drove the hiring process for 7 faculty members, 3 lecturers and 6 lab assistants tripling the size of the department from 8 staff members to 24 within one year. Received, classified, and screened over 800 CVs. Conducted on-site, Skype, and phone interviews for more than 100 candidates.

Oversaw the procurement of equipment for the departments' labs in the men's laboratory building. Determined the requirements of space for the departments' floor in the new female laboratories building. Drove the complete preparation of the departments' women's laboratories with everything from utilities, cabling, and furniture all the way to all the equipment necessary for conducting the laboratory sessions in all rooms.

Set the standards and procedures for the department, initiated regular departmental meetings as well as administrative task distribution amongst faculty members. Established an assessment based Continuous Program Improvement cycle.

Updated the two programs of study offered by the Department to meet accreditation team proposals. Supervised the faculty members through the development of outcome and objective based description for the program and all courses. Supervised the establishment of the assessment based CPI cycle which continues in the department and college until today.



- Jan. 1991 - **Part-Time Instructor.** Illinois Institute of Technology.  
 Oct. 1994 Served as an instructor for the following Electrical and Computer Engineering courses:
1. Digital Integrated Circuits.
  2. Logic Design and Implementation.
  3. Mini/Micro Computer Programming.
  4. Analog and Digital Electronic circuits.
  5. Digital Systems.
  6. Electrical Engineering for non-Electrical Engineers
- 1987 - 1991 **Teaching Assistant.** Illinois Institute Of Technology.  
 Served as a lab instructor for several Computer Engineering courses.

#### Academic Administrative Experience

1. **Department Chairman**, Sustainable and Renewable Energy Engineering Program, University of Sharjah, College of Engineering, June 2014 – September 2018.
2. **Department Chairman**, Department of Electrical and Computer Engineering. University of Sharjah, College of Engineering, September 1999 – November 2000.
3. **Director**, Center for Continuing Education and Professional Development. University of Sharjah, April 2010 – Sept. 2013.
4. Member, University Faculty Affairs Committee (Faculty Senate), Sept. 2017 – Sept. 2018
5. Member, University Student Training Council, Sept. 2006 – Sept. 2014.
6. Member, University Computing and Networking Committee. Sept. 2005 – Sept. 2009.
7. Member, University Committee on Lab Supervisor Assessment. Sept. 05 – Sept. 06.
8. Member, University Academic Computing Committee. April 2000 – Sept. 2005
9. Member, University Student Academic Affairs Committee. Sept. 2003 – Sept. 2005
10. **Chairman**, College Assessment and CPI Committee. Sept. 2005 – Feb. 2008.
11. Member, College Council. Sep 2005 – Sep. 2006 and June 2014 – September 2018.
12. Member, College Promotions Committee. June 2014 – September 2018.
13. Member, College Teaching and Learning Committee. Sep 2006 – Sept. 2016.
14. Member, College Program Advisory Committee. Jan. 2000 – Sept. 2003
15. Member, College Undergraduate Education Committee. Sept. 2001 – Sept. 2005
16. Member, College Accreditation Committee. Sept. 2001 – Sept. 2005
17. Member, College Board. Jan. 2000 – Sep. 2001
18. Member, College Teaching Committee. Sept. 1999 – Sept. 2001
19. Teaching and Learning **Coordinator**, ECE Department. Sept. 2009 – Sept. 2011.
20. Student Training **Coordinator**, ECE Department. Sept. 2004 – Sept. 2011.
21. Accreditation **Coordinator**, ECE Department. Sept. 2004 – Present.
22. **Chairman**, Department Undergraduate Education Committee. Sept. 2006 – Feb. 2008.
23. **Chairman**, Department Assessment and Continuous Program Improvement Committee. Sept. 2003 – Sept. 2007.
24. **Chairman**, Department Accreditation Committee. Sept. 2001 – Sept. 2004.
25. Member, Department Computer Engineering Search Committee. Sept. 2009 – Present.
26. Member, Department Staffing Committee. Sept. 2001 – Sept. 2002.
27. Member, Department Undergraduate Education Committee. Sept. 2001 – Sept. 2002.
28. **Chairman**, Department Staffing Committee. Feb. 2000 – Sept. 2001.
29. Member, Department Curriculum Committee. Feb. 2000 – Sept. 2001.
30. Member, Department Laboratory Development Committee. Feb. 2000 – Sept. 2001.

- Lead the preparation of the Sustainable and Renewable Energy Engineering Program's for the successful ABET accreditation in 2017 and is leading the preparation for the MOE accreditation next year.
- Lead the preparation of the Computer Engineering Program's accreditation applications in 2000, 2004 and 2009. The program received full accreditation status in July 2004 and was re-accredited in 2009 and 2014. Was also heavily involved in the program's ABET accreditation in July 2011 and re-accreditation in July 2017.
- Lead the preparation of the SREE Program's ABET and ministry accreditation applications in 2016, 2017. The program received ABET accreditation status in July 2016 and will be soon undergoing a ministry accreditation visit. Conducted numerous training sessions for faculty in the SREE department related to planning and preparing for accreditation.

#### RESEARCH RELATED COMMUNITY SERVICE

1. **Associate Editor** for the IEEE Transactions on VLSI Journal, 2003 – 2005.
2. **Member of Editorial Board**, International Journal of Advanced Research in Computer and Communications Engineering, 2012 - Present
3. **Co-Guest Editor** of the Analog Integrated Circuits and Signal Processing International Journal Special Issue on ICECS 2003.
4. Member of the IEEE Circuits and Systems Society's VLSI Applications Technical Committee
5. Member of the IEEE ICECS Conference International Steering Committee
6. Organizer, Special Session on Information Security Systems, ICECS 2008.
7. **Track Chair**, Embedded Systems and SOC – ICECS 2006 through ICECS 2010 conferences.
8. **Track Chair**, VLSI Systems – ICECS 2003 conference.
9. Member, Review Supervision Committee, ISCAS conference series. 2009 and continuing
10. Member, International Program Committee – SE conference series 2005 and continuing.
11. Member, Technical Program Committee – VLSI – AICCSA 2006 conference.
12. Member, Technical Program Committee, ICECS 2003 conference.
13. Member, Program Committee – IFEE 2006 workshop.
14. Member, ICECS 2003 Organizing Committee. May 2001 – Sept. 2005
15. Secretariat, ICECS 2003. May 2001 – Sept. 2005
16. Web and IT Chair for ISSPA 2007. Sept. 2005 – Sept. 2007.
17. Member, ISSPA 2007 Venue Execution Committee. Feb. 2007
18. Reviewer for the IEEE Transactions on VLSI Systems
19. Reviewer for the IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems
20. Reviewer for the DAC 2004 conference
21. Reviewer for the IIT 2006 conference
22. Reviewer for the AICCSA 2006 conference
23. Reviewer for the ISCAS 2003, 2004, 2005, 2006, 2007, 2008, and 2009 conferences
24. Reviewer for the SE 2005, SE 2006 and SE 2007 conferences
25. Reviewer for the ICECS 2002, 2003, 2004, 2005, 2006 and 2007 conferences
26. Reviewer for the IEEE GCC 2009 conference
27. Reviewer for the AICCSA 2009 conference
28. Reviewer for the ICM 2008 conference
29. Chaired a session at the 20<sup>th</sup> International Conference on Microelectronics (ICM 2008).

30. Chaired a session at the 3<sup>rd</sup> International Conference on Technology, Telecommunication and its Applications (ICTTA 2008).
31. Chaired a session at the 2<sup>nd</sup> International Conference on Technology, Telecommunication and its Applications (ICTTA 2006).
32. Chaired a session at the 14<sup>th</sup> International Conference on Microelectronics in Beirut Lebanon (ICM 2002).
33. Chaired a session at the 10<sup>th</sup> IEEE International Conference on Electronics, Circuits and Systems in Sharjah, UAE (ICECS 2003).

#### AFFILIATIONS

Institute of Electrical and Electronics Engineering (IEEE) – **Senior Member**  
 Computer Society  
 Circuits and Systems Society (CAS)  
 Power Systems



Association of Computing Machinery (ACM)  
 Architecture Special Interest Group (SIGARCH)  
 Design Automation Special Interest Group (SIGDA)



#### AWARDS & HONORS

- Included in the **Who's Who in Science and Engineering, 2006-2007**
- **Outstanding Teacher Award**. The University of Sharjah, June 2004 and June 2007.
- **D2000 Award** for Technology Sharing. Intel Corporation
- **Departmental Recognition Award** for a breakthrough design error checking and tracking system. Merced Horizontal Engineering Team. Intel Corporation.
- **Departmental Recognition Award** for user support. Merced Horizontal Engineering Team. Intel Corporation.
- **Intel University Recognition Award** (1997, 1998, and 1999). Intel University. Intel Corporation.
- **52 Recognition Awards** for work over and beyond the call of duty. Merced Microprocessor Design Team. Intel Corporation.
- Received “**University Highest Honors**” upon graduation from the University of Illinois at Chicago.
- A member of the “**Honors College**” at the University of Illinois at Chicago.
- On the **Dean's List** repeatedly at the University of Illinois at Chicago.

## **AREAS OF RESEARCH INTEREST**

Research interest in a broad perspective is to investigate issues affecting the design of IT infrastructure and developing practical solutions that range through methodology, software, and hardware elements.

In the past couple of years, I have redirected my research interests towards the field of renewable energy and how electronics and computing can be used for the improvement of efficiencies in renewable energy systems. Whether the systems are used for power generation, energy storage, or the use of renewable energy systems in daily life and industrial production.

## **RESEARCH PROJECTS UNDERWAY**

- 1) IOT Utilization in the Management and Control of Renewable Energy Systems**  
Investigating the use of IOT technologies and systems for the management and control of RE Systems. Especially off-grid generation systems with human-access limitations.
- 2) Optimization of Renewable Energy Systems**  
Utilizing my background in Electrical Engineering, I am currently involved in a number of research initiatives related to optimization of Renewable Energy Systems.
- 3) Optimization of Bioinformatics Algorithms**  
The field of Bioinformatics is growing rapidly as the data-size is growing at a rate faster than Moore's law. This has made algorithms used in this field a bottleneck in the process of analysis. In this research, we are investigating methods to optimize the operation and application of these algorithms to regain part of the computational complexity.
- 4) A system for protecting IP rights in FPGA design.**  
To maintain a cost advantage, fab-less design houses depend heavily on licensing ready-made intellectual property (IP) and integrating it into their designs. However, once the IP is licensed, the IP provider practically loses control of the number and type of instantiations made of the IP. This project aims to develop a secure mechanism and licensing model for protecting against IP over-deployment. The technique is based on developing an Electronic-DNA mechanism that can be integrated into the FPGA chips to ensure complete infallible traceability and matching between IP design and target devices.

## PUBLICATIONS

### Book Chapters

- [BC1] **Soudan, B.**, Adi, W., and Hanoun, A.R., (2015) “IP Protection of FPGA Cores through a Novel Public/Secret-key Encryption Mechanism,” Book Chapter, *Secure System Design and Trustable Computing*, edited by Chip-Hong Chang, Miodrag Potkonjak, Published by: Springer, ISBN: 9783319149714, pp. 369 – 390.
- [BC2] Saad, M., and **Soudan, B.**, (2012) “Program Review: Computer Engineering At The University Of Sharjah Case Study,” Book Chapter, *Engineering Education in the 21st Century, Quality, Globalization and Local Relevance*, Published by: College of Graduate Studies and Research, University of Sharjah, pp. 329 – 337.

### Journal Papers

- [JP1] Olabi, A.G., Mahmoud, M., **Soudan, B.**, Wilberforce, T., and Ramadan, M., (2019). Geothermal Based Hybrid Energy Systems, Toward Eco-Friendly Energy Approaches. *Renewable Energy*. **In press**.  
<https://doi.org/10.1016/j.renene.2019.09.140>
- [JP2] **Soudan, B.**, (2019) Community-Scale Baseload Generation from Marine Energy. *Energy*. September 2019. Vol. 189.  
<https://doi.org/10.1016/j.energy.2019.116134>
- [JP3] Al Shaabi, M., Hatamleh, K. S., Godsdan, S. A., **Soudan, B.**, and El-Nady, A., (2019) “Robust nonlinear control and estimation of an PRRR Robot System,” *International Journal of Robotics and Automation*. January 2019.  
<https://doi.org/10.2316/J.2019.206-0160>
- [JP4] Alami, A. H., Aokal, K., Zhang, D., Taieb, A., Faraj, M., Alhammadi, A., **Soudan, B.**, Elhajjar, J., Irimia-Vladu, M., (2019) “Low-Cost Dye-Sensitized Solar Cells Using Ball-Milled Tellurium-Doped Graphene for Counter Electrode and a Natural Sensitizer Dye,” *International Journal of Energy Research*.  
<https://doi.org/10.1002/er.4684>
- [JP5] Abidoeye, L. K., Bani-Hani, E., El Haj Assad, M., AlShabi, M., **Soudan, B.**, Oriaje, A.T., (2019) “Effects of Environmental and Turbine Parameters on Energy Gains from Wind Farm System: Artificial Neural Network Simulations,” *Wind Engineering*.  
<https://doi.org/10.1177/0309524X19849834>.
- [JP6] Wilberforce, T., El Hassan, Z., Durrant, A., Thompson, J., **Soudan, B.**, & Olabi, A. G. (2019). Overview of ocean power technology. *Energy* (175). 15 May 2019. pp. 165 – 181.  
<https://doi.org/10.1016/j.energy.2019.03.068>.
- [JP7] Willberforce, T., Barghouti, A., El Hassan Z., Thompson, J., **Soudan, B.**, and Olabi A.G., (2019). Prospects and challenges of concentrated solar photovoltaics and enhanced geothermal energy technologies. *Science of the Total Environment* (659). 1 April 2019, 99. 851 – 861.  
<https://doi.org/10.1016/j.scitotenv.2018.12.257>
- [JP8] Wilberforce, T., Baroutaji, A., **Soudan, B.**, Al-Alami, A.H., Olabi, A.G., (2019) “Outlook of Carbon Capture Technology and Challenges,” *Science of the Total Environment* (657), 20 March 2019, pp. 56 - 72.

<https://doi.org/10.1016/j.scitotenv.2018.11.424>

- [JP9] Al-Alami, A.H., Okal, K., Zhang, D., and **Soudan, B.**, (2018) “Bulk Turbostatic Graphene Deposition on Aluminum Substrates via High-pressure Graphite Blasting,” *Applied Nanoscience* (8:8), 1 November 2018. pp. 1943-1950,  
<https://doi.org/10.1007/s13204-018-0862-1>
- [JP10] Abdelkareem, M.A., Assad, M. E. H., Sayed, E.T., and **Soudan, B.**, (2018) “Recent progress in the use of renewable energy sources to power water desalination plants,” *Desalination*, (435), 1 June 2018. pp. 97 – 113.  
<https://doi.org/10.1016/j.desal.2017.11.018>.
- [JP11] Bonny, T., and **Soudan, B.**, (2105) “High Speed Database Sequence Comparison,” *Procedia – Computer Science*. Vol. 62, pp. 73 – 80.
- [JP12] Tabbaa, H., and **Soudan, B.**, (2015) “Computer-Aided Training for Quranic Recitation,” *Procedia – Social and Behavioral Sciences*. Vol. 192, pp. 778 – 787.
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