Dr. Ramzi JABER

Ph.D. and Researcher in Computer Engineering

Embedded Systems & AIoT Specialist - Ternary Computing Focus

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Google Scholar | **H-Index: 12** | **23+ Peer-Reviewed Publications**

Web of Science | **90+ Article Reviews**

Research Gate | **Ranked TOP 11% in the world**

Certifications | **14**

Research Profile Summary

Accomplished researcher in embedded systems and IoT with **6 years of specialized research** in ternary circuits, microelectronics, and artificial intelligence. Author of **23+ peer-reviewed publications** with an **H-index of 12**, contributing novel methodologies in multiple-valued logic circuit design and data transmission for embedded systems. Currently engaged in international research collaborations across **7 countries** (Lebanon, KSA, France, Ireland, Malaysia, Korea, and India), focusing on CNFET-based ternary logic systems and SDN controller design.

Core Research Impact: Pioneer in ternary logic circuit design using Carbon Nanotube Field-Effect Transistors (CNFETs), with publications in top-tier journals including IEEE Access (Q1) and Micromachines (Q2). Active peer reviewer for **90+ scientific articles** and technical program committee member for international conferences.

Academic Excellence: 17 years of teaching experience across multiple universities, with expertise in microprocessor systems, digital electronics, computer architecture, and programming. Established university's first specialized lab for ternary logic circuit simulation.

Research Experience & Positions

International Freelance Research Collaborator

Multiple Universities | Lebanon, KSA, France, Ireland, Malaysia, Korea, India

Jan 2021 – Present (4 years, 9 months)

- Leading research initiatives in multiple-valued logic systems and embedded AI applications
- **Published 15+ research papers as primary author during this period**
- Developed novel CNFET-based architectures for energy-efficient computing
- Established international research networks advancing ternary logic applications

Research Fellow (Remote)

Qatar University - College of Engineering | Qatar |*Feb 2021 – Aug 2021 (7 months)*

- Breakthrough Achievement: First-time application of Multiple-Valued Logic systems in haptic device technology
- Resulted in 2 publications in IEEE ACCESS (Q1 journal)
- Collaborated with international team on novel decoder-less architectures

Assistant Professor & Research Lead | *Sep 2020 – Dec 2022 (2 years, 3 months)*

Lab Instructor & Lecturer | *Sep 2006 – Aug 2020 (14 years)*

Beirut Arab University - Faculty of Engineering | Lebanon

- Supervised numerous undergraduate and graduate projects
- Published 10 peer-reviewed papers during tenure
- **Established university's first specialized lab for ternary logic circuit simulation**
- **Taught 20+ courses** in computer engineering and embedded systems
- **Taught 30+ Software** & Computer Languages
- Delivered instruction in microprocessor systems, digital electronics, and programming
- Developed curriculum for RISC-V CPU architecture and FPGA design courses

Associate Professor (Part-time)

Notre Dame University - Faculty of Engineering | Lebanon | *Jan 2025 – Present*

- Teaching advanced courses at Shouf Campus

Research Expertise & Methodologies

Primary Research Areas

Microelectronics: CNFET-based circuit design, ternary logic systems, energy-efficient computing architectures, IoT device optimization

AI Integration: Hardware-software co-design for AI applications, embedded intelligence systems, performance optimization algorithms

SDN: Controller architecture design, network optimization, hardware acceleration for SDN applications

Health Care: Circuit design for medical applications, brain-machine interfaces

Research Methodologies & Tools

Circuit Design: HSPICE circuit simulation, MicroCAP modeling, energy consumption analysis

Algorithm Development: Multiple-valued logic algorithm design, optimization techniques, performance evaluation methodologies

Academic Skills: Literature review and synthesis, critical analysis, research problem identification, international collaboration management

Programming & Development Environments

Research Computing: MATLAB (algorithm development), Python (data analysis), C/C++ (embedded systems), VHDL (hardware description)

Simulation Platforms: Intel Quartus, ModelSim, Ripes (RISC-V), MARS (MIPS), Arduino (prototyping), FPGA development

Documentation: LaTeX (TexWorks for academic writing), research data management, statistical analysis tools

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Publications & Research Output

Publication Metrics

- **Total Publications:** 23 published + 2 in pipeline
- **Google Scholar H-Index:** 12
- **Peer Review Service:** 90+ articles reviewed
- **Research Impact:** International citations and collaborations across 7 countries
- **Journal Quality:** Multiple Q1 and Q2 publications

Selected High-Impact Journal Publications

IEEE Access (Q1 Journal)

- "Ultra-Low Energy CNFET-Based Ternary Combinational Circuits Designs" (2021)
- "Novel Ternary Adder and Multiplier Designs Without Using Decoders or Encoders" (2021) - Co-authored with Qatar University
- "High-Performance and Energy-Efficient CNFET-Based Designs for Ternary Logic Circuits" (2019)

Results in Engineering (Q1)

- "Design implementations of ternary logic systems: A critical review"

Micromachines (Q2)

- "Ternary Full Adder Designs Employing Unary Operators and Ternary Multiplexers" (2023)
- "Enhanced CPU Design for SDN Controller" (2024)

Recent Conference Contributions (2024-2025)

ICM 2024: "Proposed Two Ternary Decoders Using CNTFET" (Qatar)
ACTEA'25: Ternary Inverter and Decoder using CNTFET (Lebanon)
ICECS 2025: Ternary Multiplexer using CNTFET (Morocco)

Book Chapter Contribution

IGI Global 2024: "Artificial Intelligence in the Age of Nanotechnology"
Chapter 6: "The Convergence of AI and BCIs: A New Era of Brain-Machine Interfaces"

Professional Service & Academic Leadership

Editorial & Review Activities

Peer Reviewer | International Journals & Conferences | *2019 – Present*

- **90+ manuscripts reviewed** for international journals and conferences
- **Web of Science certified reviewer**
- Regular reviewer for IEEE Access, Micromachines, and other Q1/Q2 journals
- **Technical Program Committee** member for IEEE and ACM sponsored conferences

Conference Leadership

Session Chair | ACTEA 2025
6th International Conference on Advances in Computational Tools for Engineering Applications
Finance co-Chair | IC2SPM 2024
2nd International Conference on Smart Systems and Power Management

Tutorial Contributions

ICM 2021: "How to Simulate Ternary Logic Circuits from A to Z Using CNFET and Implemented in HSPICE Simulator"
Research methodology tutorial contributing to advancing field expertise

Other Academic Service

Assistant External Examiner | RMIT University, Australia
2020-2021 - Ph.D. candidate examination
Professional Activities Coordinator & Webmaster | IEEE Lebanon Joint Chapter
2019-2023 - IE13/PE31/CAS04/PEL35 (Industrial Electronics, Power & Energy, Circuits and Systems, Power Electronics)

Academic Qualifications

Ph.D. in Computer Engineering

Beirut Arab University | Lebanon | *2016 – 2020*
Specialization: Embedded Systems and IoT
Dissertation:
"Multiple-Valued Logic Circuit Design and Data Transmission Intended for Embedded Systems"

Distinguished Committee: 5-members:

- **Prof. Mohamad Sawan** (International Committee Member) - Chair Professor, Westlake University China & Polytechnique Montreal Canada
- Prof. Ali Haidar (Chair) - Computer Engineering Program Coordinator at BAU
- Prof. Ziad Osman - Chair of Electrical & Computer Engineering Department at BAU
- Prof. Issam Damaj - Director of the Center for Quality Assurance at BAU
- Prof. Mohamed Dbouk - Director of L'ARiCoD Lab and Master Coordinator at Lebanese University

Research Contributions:
Established new methodologies for ternary logic implementation in embedded systems

Master in Computer Engineering & Informatics

Beirut Arab University | Lebanon | *2008 – 2010*
Thesis: "Applications and Study of Network Flow Algorithms"

Bachelor in Computer Engineering

Beirut Arab University | Lebanon |*1996 – 2001*
Project: "Hotel Management & Online Reservation System"

Teaching Experience & Courses

Courses Taught (17 Years of Experience)

Computer Architecture & Hardware:

- Microprocessor (8085) System Design
- Computer Organization and Architectures: RISC-V CPU
- Fundamentals of Computer Hardware: RISC MIPS
- Computer Hardware: FPGA
- Digital Electronics
- Digital Systems I & II
- Microcontroller (16F84)

Programming & Software Development:

- Computer Programming I & II: C, C++
- Programming For Engineers: Python
- Object Oriented Programming: OOP
- Database Systems

Theory & Analysis:

- Design and Analysis of Algorithms
- Performance Evaluation
- Queueing and Modeling
- Discrete Structures
- Computer Networks

Software & Tools Proficiency

Hardware Design & Simulation:

- MPLAB IDE: Microcontroller programming
- Intel VTune Profiler: Performance analysis
- MARS: RISC MIPS assembly code
- Ripes: RISC-V assembly code
- Arduino: Robotics and prototyping
- Intel Quartus & ModelSim: VHDL

Programming Environments:

- MS Visual Studio: C, C++, VB.Net, ASP.Net
- PyCharm: Python
- Netbeans: Java
- MATLAB
- LispWorks: LISP
- PROLOG

Web Development:

- HTML5, JavaScript, CSS, PHP
- Apache & IIS Web Servers

Database & Networking:

- Cisco Packet Tracer: Network simulation
- SQL Server, MySQL

Other Tools:

- MS Office Suite: Word, Excel, Access, PowerPoint

Industry Research Applications

Technology Transfer & Innovation

Entrepreneur & Owner | JABERPC & Technology Co. (Startup) | jaberpc.technolgy | Lebanon

Jan 2023 – Present (2 years, 9 months)

- Applying research innovations in commercial embedded systems and IoT solutions
- Bridging academic research with industry applications in solar energy systems
- Sale and maintenance of computers and solar systems
- Website: www.jaberpc.technology

Business Development Manager, MENA Region | SENSONEO Co. | Slovakia

May 2021 – Dec 2023 (2 years, 7 months)

- Applied IoT research expertise to smart cities and waste management solutions
- Technology assessment and market analysis for advanced sensor systems
- Managed business development for IoT fill-level sensors across Middle East and North Africa

Additional Professional Experience

IT Manager & System Administrator| Lebanese University | Lebanon

Sep 2006 – Dec 2018 (12 years, 3 months)

Business Development & IT Manager | AluMarket (Chouman Group) | Lebanon

Jun 2005 – Dec 2017 (12 years, 6 months)

Army Lieutenant (Developer Engineer) | Ministry of Defense - Lebanese Armed Forces | Lebanon

Feb 2002 – Feb 2003 (1 year)

Technical ICT Skills & Expertise

System Administration:

- Windows Server: Active Directory, DHCP, DNS
- SQL Server Database Replications
- Virtual Servers: VMWare
- Data Backup & Recovery

Network & Security:

- WAN & LAN Troubleshooting (CISCO)
- Surveillance Systems: Cameras, DVR, Access Control
- Voice over IP (VoIP) CISCO
- Network Security & Ethical Hacking

Development & Design:

- Website Design (E-commerce platforms)
- Domain Names & Hosting management
- Custom program development
- Moodle Configuration
- Photoshop Design
- AutoCAD Drawing

Hardware Maintenance:

- Computers, Laptops maintenance
- Dental Machines (CBCT, I-CAT, VISTASCAN, RVG)
- Solar ON/OFF Grid Systems

Certifications

1. **Introduction to Artificial Intelligence (AI)** - ICDT, Lebanon (2021)
2. **Certified Ethical Hacker (CEH)** - ICDT, Lebanon (2019)
3. **Ethical Hacker** - **AIAE** (American Institute for Applied Education), **USA** (2019)
4. **The Basic Principles of Citizen Service** - OMSAR, Lebanon (2019)
5. **Basics of Management** - OMSAR, Lebanon (2017)
6. **Introduction to Cyber Security** - CISCO, **USA** (2017)
7. **Green Energy Promoter** - **European Union** (GR.ENE.CO), Lebanon (2014)
8. **CCNA - Routing Protocols and Concepts** - CISCO, **USA** (2010)
9. **CCNA - Network Fundamentals** - CISCO, **USA** (2010)
10. **Assembly & Maintenance Computers** - BAU, Lebanon (1999)
11. **Volunteer in Lebanese Red Cross First Aid Teams** (1996-2001)

Professional Memberships

- **The Lebanese Order of Engineers and Architects** (2002 – Present)
- **The Institute of Electrical and Electronics Engineers (IEEE)** (2017 – 2022)
- **Lebanese Red Cross** – First Aid & Trainer (1996 – 2001)
- **Jeunesse Anti Drogues (JAD)** (1998 – 2004)
- **Green Peace** (1998 – 2006)

Languages

- **Arabic:** Native proficiency
- **English:** Professional research and publication proficiency
- **French:** Intermediate (enables collaboration with French research institutions)

Research Vision & Future Directions

Current Focus: Advancing energy-efficient computing through novel ternary logic architectures, with applications in IoT devices and AI hardware acceleration

Emerging Interests: Integration of hardware AI and Health Care Circuit Design with ternary logic systems, brain-machine interfaces

Collaboration Goals: Expanding international research partnerships to address global challenges in sustainable computing and embedded intelligence systems

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References

Available upon request

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