

Dr. Ramzi JABER

Computer Engineering Researcher | International Collaboration
Embedded Systems | Computer Architecture | Multiple-Valued Logic | AI Hardware

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Profiles: (Click to open the links below)

- Google Scholar H-Index:12| i10-index:14| 556+ citations
- 24+ Peer-Reviewed Publications | 15 as First Author | 1 as Sole Author
- 100+ Verified Peer Reviews
- ResearchGate: Top 7% worldwide in Education
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Research Profile

Computer Engineering researcher with a Ph.D. and a record of **24+ peer-reviewed publications**, **556+ Google Scholar citations**, an h-index of 12, and an i10-index of 14. Research spans multiple-valued logic, CNTFET-based circuit design, embedded systems, computer architecture, AI hardware, RRAM, TCAM, and AI/BCI convergence. Active in international research collaborations involving universities and research teams across **eight countries, doctoral co-supervision, funded research, peer review, conference organization, and doctoral examination.**

Research Highlights

- **Research output:** 24+ peer-reviewed publications; 15 first-author publications and one sole-author IEEE conference paper; 556+ citations; h-index 12; i10-index 14.

- **International collaboration:** Research and co-authored outputs with collaborators across eight countries: Saudi Arabia, Malaysia, Ireland, South Korea, India, USA, France, and Qatar.

- **University and research partners:** King Faisal University; Universiti Teknologi PETRONAS; VIT Bhopal University; PES University; Sejong University; University College Cork; Paris-Saclay University/LISN; Qatar University; Lebanese University; and NanosTech.

- **Funded research:** Qatar University project on the application of multiple-valued logic in a haptic device, supported by NPRP/QNRF, Grant 10-0205-170346; two resulting IEEE Access (Q1) papers (2021).

- **Research supervision:** Ph.D. co-supervision at Beirut Arab University (2021–2024), contributing to three co-authored peer-reviewed publications.

- **Academic service:** 100+ verified peer reviews; Technical Program Committee member; conference Session Chair and Finance Co-Chair; IEEE Lebanon Joint Chapter coordination; invited Assistant External Examiner at RMIT University, Australia.

Academic Service & Research Supervision

- (2021–2024) **Ph.D. Co-Supervisor:** Co-supervised a Ph.D. student at Beirut Arab University
  – Three co-authored peer-reviewed publications
- (2019-Present) **Reviewer for peer-reviewed journals: 100+ verified reviews**
- (2019-Present) **Technical Program Committee (TPC) member for international conferences**
- (2025) **Session Chair** at the Sixth Int. Conf. on Advances in Computational Tools for Eng. Applications (ACTEA)
- (2024) **Finance Co-Chair** at the 2nd Int. Conf. on Smart Systems and Power Management (IC2SPM)
- (2021-2022) **Assistant External Examiner — Ph.D. Defense:** For a Ph.D. candidate at RMIT University, Australia
- (2021) **Conference Tutorial:** International Conference on Microelectronics (ICM)
  – How to Simulate Ternary Logic Circuits from A to Z Using CNTFET and Implemented in the HSPICE Simulator?
- (2019-2023) **Professional activities coordinator & webmaster** of the IEEE Lebanon Joint Chapter
  – IE13/PE31/CAS04/PEL35 (Industrial Elect., Power & Energy, Circuits and Systems, Power Electronics)
- (18 years cumulative) **Project Supervision** across taught courses at
  – Notre Dame University, Beirut Arab University, and Lebanese University.
- (2015–2024, selected years) **Judge & Technical Committee Member**
  – National Robotics and Artificial Intelligence Competition (NRC), organized by The International Center for Training & Development (ICTD).
  – Annual Robotics Competition (ARC), a national robotics competition in Lebanon. Evaluated robotics design, autonomous behavior, AI/programming components, and team presentations.

Research Interests

- **Multiple-Valued Logic (MVL):** circuit design, CNTFET, embedded systems and data transmission
- **Embedded Systems & AI Hardware:** energy-efficient computing, TinyML and hardware/software integration
- **AI & Large Language Models:** applied AI systems, LLM applications and deployment
- **Brain–Machine Interfaces:** BCI and AI convergence
- **Network Research and SDN:** SDN controller architecture, network optimization, performance evaluation, and hardware acceleration for software-defined networks
- **Hardware Security & Biomedical Systems**

Research Methodologies & Technical Tools

Circuit Design and Simulation: CNFET-based circuit modeling, ternary logic design, HSPICE circuit simulation, MicroCAP modeling, energy and performance analysis, and comparison of ternary circuits with equivalent binary implementations.
Algorithm Design and Evaluation: Multiple-valued logic algorithm design, decoder-less architectures, logic optimization, network optimization, SDN controller architecture analysis, performance evaluation, and hardware/software co-design.
Research and Development Tools: MATLAB, Python, C/C++, VHDL, Intel Quartus, ModelSim, Ripes (RISC-V), MARS (MIPS), Arduino prototyping, FPGA development, and LaTeX.

Research Experience & International Collaborations

(1) Notre Dame University - Faculty of Engineering — LEBANON
Associate Professor (Part-time) at Shouf Campus — *1/2025 – Present*: (1 y, 9 m)

- First author of 4 peer-reviewed publications.

(2) International Research Collaborations — KSA, MALAYSIA, IRELAND, KOREA, INDIA, USA, FRANCE, QATAR
Independent Researcher in Embedded Systems and AI. — *1/2021 – Present*: (5 y, 9 m)

- King Faisal Univ. (KSA), Univ. Teknologi Petronas (Malaysia), VIT Bhopal Univ. & PES Univ. (India), Sejong Univ. (Korea), and Univ. College Cork (Ireland):

- Research on ternary logic systems, RRAM, TCAM, and Neural networks
- Co-authored a journal paper in *Results in Engineering* (2024, Q1).
- One additional manuscript is under review.

- NanosTech (USA) & Lebanese University:
- Co-authored Chapter 6, *"The Convergence of AI and BCIs: A New Era of Brain-Machine Interfaces"* in
- *Artificial Intelligence in the Age of Nanotechnology*, IGI Global, 2024.

- Paris Saclay University - LISN (France):
- Research collaboration on comparing ternary circuits with their corresponding binary circuits.
- Co-authored two Journal papers (2023).

- Qatar University - College of Engineering:
- First application of Multiple-Valued Logic in a haptic device.
- Research supported by the National Priorities Research Program (NPRP) through the Qatar National Research Fund (QNRF), Grant 10-0205-170346.
- Resulted in two peer-reviewed *IEEE Access* (Q1) journal papers (2021)

(3) Beirut Arab University - Faculty of Engineering — LEBANON
- Research Collaborator & Ph.D. Co-Supervisor — *1/2021 – 12/2024*: (4 y)
- Co-supervised a PhD Student, resulting in three co-authored peer-reviewed publications.
- Co-authored 12 peer-reviewed publications through research collaborations.
- Established BAU's first specialized ternary logic circuit simulation lab.

- Assistant Professor — *9/2020 – 5/2021*: (8 m)

- Lab Instructor & Lecturer — *9/2006 – 8/2020*: (14 y)

(4) IRC NGO (International Rescue Committee) — LEBANON
Trainer (Computer & Smart Phone Maintenance) — *1/2015 – 4/2015*: (3 m)

(5) Lebanese University - Faculty of Sciences — LEBANON
Lab Instructor — *10/2006 – 9/2010*: (4 y)

Professional & Industry Experience

(6) Trust Scale (An e2f Company) | Full Remote — USA
SPARQL Annotations Specialist — *7/2025 – 7/2026*: (1 y)
trustscale.ai
- Performed data annotation using SPARQL queries for a US-based AI company
- Applied semantic web technologies for dataset labeling and categorization
- Evaluated data quality to ensure accuracy and compliance with guidelines
- Collaborated remotely with a US-based team, applying effective cross-cultural communication
- Utilized knowledge graphs and RDF structures for precise data classification

(7) JABERPC & Technology Co. — LEBANON
Founder & Technical Lead — *2003 – Present*: (23 y, 4 m)
www.jaberpc.technology
– Designed and developed full-stack software products, including a React-based Point-of-Sale system with hardware integration.
– Built AI-powered MVPs using modern LLM APIs for applied prototypes and proof-of-concept work.
– Delivered embedded systems, IoT, and engineering solutions, leading requirements, design, implementation, deployment, and support.

(8) SENSONEO Co. — SLOVAKIA
Business Development Manager in the MENA Region (Remotely) — *5/2021 – 12/2023*: (2 y 7 m)
www.sensoneo.com
- Worked on smart-city and waste-management solutions involving IoT fill-level sensors

[9] Lebanese University — Lebanon
- **Faculty of Dental Medicine:** ***IT Manager*** — *2/2014 – 12/2018*: (4 y 10 m)
- **Doctoral School of Science and Technology:** ***IT Engineer*** — *1/2008 – 12/2009*: (1 y)
- **Faculty of Sciences:** ***System Administrator*** — *10/2006 – 10/2010*: (4 y)

[10] AluMarket (Chouman Group): Aluminum wholesaler — Lebanon
- **Business Development & IT Manager** — *6/2005 – 12/2017*: (12 y 6 m)

[11] Ministry of Defense Lebanese Armed Forces — Lebanon
- **Army Lieutenant (Developer Engineer):** www.lebarmy.gov.lb — *2/2002 – 2/2003*: (1 y)

Selected 4 from 12 Certifications

1. **CCNA Instructor (Cisco Networking Academy)** — Cisco - USA - 2010
2. **Ethical Hacker** — AIAE - USA - 2019
3. **Introduction to Cyber Security** — Cisco - USA - 2017
4. **Introduction to Artificial Intelligence** — ICTD - Lebanon - 2021

Education

Beirut Arab University — Debbieh, Lebanon

- **Ph.D. in Computer Engineering** — *2016 – 2020*
  - Dissertation Title:
    "Multiple-Valued Logic Circuit Design and Data Transmission Intended for Embedded Systems."
  - Committee:
    1. **Prof. Ali Haidar**: Committee Chair and Computer Engineering Program Coordinator at BAU
    2. **Prof. Ziad Osman**: Chair of Electrical & Computer Eng. Dept. at BAU
    3. **Associate Prof. Issam Damaj**: Director of the Center for Quality Assurance at BAU
    4. **Prof. Mohamed Dbouk**: Director of L'ARiCoD: Lab of Advanced Research in Intelligent Computing & Data, and Master Coordinator at Lebanese Univ.
    5. **Prof. Mohamad Sawan**: Chair Professor at Westlake University, Hangzhou, China and Canada Research Chair at Polytechnique Montreal, Canada
- **Master in Computer Engineering & Informatics** — *2008 – 2010*
  - Thesis Title: "Applications and Study of Network Flow Algorithms."
- **Bachelor in Computer Engineering** — *1996 – 2001*
  - Project Title: "Hotel Management & Online Reservation System."

Memberships

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

Languages

- Arabic (Mother Tongue)
- English (Professional)
- French (Intermediate)

Research Publications & Scholarly Output

Google Scholar: https://cutt.ly/Mm461I1

- **24+ peer-reviewed publications** • **1 under review** • **2 under preparation**

Under Review:

1. **R. A. Jaber**, et al., *"Design of Ternary Pseudo Random Number Generator for Secure IoT Applications,"* Engineering Science and Technology Journal (JESTECH) **Q1, 2026**.

Published Peer-Reviewed Journals:

1. Furqan Zahoor, **R. A. Jaber**, et al., *"Design implementations of ternary logic systems: A critical review,"***Results in Engineering journal**, Volume 23, **2024**, https://doi.org/10.1016/j.rineng.2024.102761.
2. Hiba Bazzi, **R. A. Jaber**, et al., *"Enhanced CPU Design for SDN Controller"* in **Micromachines Journal 2024**; 15(8):997. https://doi.org/10.3390/mi15080997
3. D. Etiemble, and **R. A. Jaber**, *"Comparing Unbalanced and Balanced CNTFET Ternary Adders and Multipliers,"* in **Asian Journal of Research in Computer Science (AJRCOS)**, vol. 16, issue 4, pp. 396-417,**2023**,DOI: 10.9734/AJRCOS/2023/v16i4400
4. D. Etiemble, and **R. A. Jaber**, *"Design of (3,2) and (4,2) CNTFET Ternary Counters for Multipliers,"* in **Asian Journal of Research in Computer Science (AJRCOS)**, vol. 16, issue 3, pp. 103-118, **2023**, DOI: 10.9734/AJRCOS/2023/v16i3349.
5. **R. A. Jaber**, et al., *"Ternary Full Adder Designs Employing Unary Operators and Ternary Multiplexers,"* in **Micromachines (IF= 3.5, Q2)**, vol. 14, pp. 1064, **2023**, DOI: 10.3390/mi14051064.
6. **R. A. Jaber**, et al., *"Ultra-Low Energy CNFET-Based Ternary Combinational Circuits Designs,"* in **IEEE Access (IF= 4.8, Q1)**, vol. 9, pp. 115951-115961, **2021**, DOI: 10.1109/ACCESS.2021.3105577.
7. J. M. Aljaam, **R. A. Jaber** and S. A. Al-Maadeed, *"Novel Ternary Adder and Multiplier Designs Without Using Decoders or Encoders,"* in **IEEE Access (IF= 4.8, Q1)**, vol. 9, pp. 56726-56735, **2021**, DOI: 10.1109/ACCESS.2021.3072567.
8. **R. A. Jaber**, Abdallah Kassem, Ahmad ElHajj, Lina Nimri, Ali Haidar, *" CNFET-Based Designs of Ternary Half-Adder using a Novel "Decoder-less" Ternary Multiplexer based on Unary Operators,"* **Microelectronics Journal (IF= 3, Q2), Feb 2020**, DOI: 10.1016/j.mejo.2019.104698.
9. **R. A. Jaber**, Abdallah Kassem, Ahmad ElHajj, Lina Nimri, Ali Haidar, *"High-Performance and Energy-Efficient CNFET-Based Designs for Ternary Logic Circuits,"* **IEEE Access (IF= 3.9, Q1), July 2019**, DOI: 10.1109/ACCESS.2019.2928251.

Published Peer-Reviewed Conferences:

1. **R. A. Jaber**, B. Owaidat and A. Kassem, *"A Decoder-Based CNTFET Ternary Half-Adder Design,"* 2026 IEEE 5th International Multidisciplinary Conference on Engineering Technology **(IMCET 2026)**, Beirut, Lebanon, pp. 1-5, doi: 10.1109/IMCET69180.2026.11503715.
2. **R. A. Jaber**, *"Proposed a Ternary Adder using CNTFET"* The IEEE 37th International Conference on Microelectronics **(ICM 2025)**, Cairo, Egypt, 2025, pp. 1-5, doi: 10.1109/ICM66518.2025.11322526.
3. **R. A. Jaber**, A. Kassem and A. M. Haidar, *"Proposed a Ternary Multiplexer using CNTFET,"* 2025 32nd IEEE International Conference on Electronics, Circuits and Systems **(ICECS 2025)**, Marrakech, Morocco, pp. 1-4, doi: 10.1109/ICECS66544.2025.11270756.
4. **R. A. Jaber**, et al., *"Proposed a Ternary Inverter and a Ternary Decoder using CNTFET,"* **ACTEA'25.** The Sixth International Conference on Advances in Computational Tools for Engineering Applications, NDU, Lebanon, September 24-26, 2025.
5. **R. A. Jaber**, H. S. Bazzi, A. Kassem and A. M. Haidar, *"Proposed Two Ternary Decoders Using CNTFET,"* 2024 Int. Conf. on Microelectronics **(ICM 2024)**, Doha, Qatar, pp. 1-4, doi: 10.1109/ICM63406.2024.10815865.

6. **R. A. Jaber**, H. Bazzi, A. Haidar, B. Owaidat and A. Kassem, *"1-trit Ternary Multiplier and Adder Designs Using Ternary Multiplexers and Unary Operators,"* 2021 International Conference on Innovation and Intelligence for Informatics, Computing, and Technologies **(3ICT 2021)**, pp. 292-297, doi: 10.1109/3ICT53449.2021.9581366.
7. **R. A. Jaber**, Abdallah Kassem, Ahmad ElHajj, Ali Haidar, *"A Novel CNFET-Based Ternary to Binary Converter Design in Data Transmission,"* The IEEE 32nd International Conference on Microelectronics **(ICM 2020)**, Aqaba, Jordan, 14-17 Dec. 2020, pp. 1-4, doi: 10.1109/ICM50269.2020.9331769.
8. **R. A. Jaber**, Abdallah Kassem, Ali Haidar, *"CNTFET-Based Design of Ternary Multiplier using Only Multiplexers,"* The IEEE 32nd International Conference on Microelectronics **(ICM 2020)**, Aqaba, Jordan, 14-17 Dec. 2020, pp. 1-4, doi: 10.1109/ICM50269.2020.9331806.
9. **R. A. Jaber**, Bilal Owaidat, Abdallah Kassem, Ali Haidar, *"A Novel Low-Energy CNTFET-Based Ternary Half-Adder Design using Unary Operators,"* The IEEE International Conference on Innovation and Intelligence for Informatics, Computing, and Technologies **(3ICT 2020)**, Sakheer, Bahrain, 20-21 Dec. 2020, pp. 1-6, doi: 10.1109/3ICT51146.2020.9311953.
10. **R. A. Jaber**, Abdallah Kassem, Ahmad ElHajj, Lina Nimri, Ali Haidar, *"A Novel Binary to Ternary Converter using Double Pass-Transistor Logic,"* The IEEE 31st International Conference on Microelectronics **(ICM 2019)**, 15-18 Dec. 2019, Cairo, Egypt, DOI: 10.1109/ICM48031.2019.9021886.
11. **R. A. Jaber**, Ahmad ElHajj, Lina Nimri, Ali Haidar, *" A Novel Implementation of Ternary Decoder Using CMOS DPL Binary Gates,"* International Arab Conference on Information Technology **(ACIT 2018)** by IEEE, 28-30 Nov. 2018, Lebanon, DOI: 10.1109/ACIT.2018.8672698.
12. **R. A. Jaber** and Ali HAIDAR, *"Ternary Data Transmission between Hosts,"* the 23rd International Scientific Conference **LAAS 2017**, Beirut, Lebanon.
13. A. Belal, B. Owaidat, N. Saleh, **R. A. Jaber**, *" Error correction capabilities in block ciphers,"* 2012 2nd International Conference on Advances in Computational Tools for Engineering Applications **(ACTEA 2012)** by IEEE, 12-15, Lebanon, DOI: 10.1109/ICTEA.2012.6462905.

Tutorial in Conferences:

1. **R. A. Jaber**, "How to Simulate Ternary Logic Circuits from A to Z Using CNTFET and Implement Them in the HSPICE Simulator?," 2021 International Conference on Microelectronics **(ICM 2021)**, DOI: 10.1109/ICM52667.202

Books:

1. **R. A. Jaber**, et al., "Chapter 6: The Convergence of AI and BCIs: A New Era of Brain-Machine Interfaces," in the book *Artificial Intelligence in the Age of Nanotechnology* Jaber, Wassim, editor. **IGI Global, 2024**. https://doi.org/10.4018/979-8-3693-0368-9