RÉSUMÉ

Dr. Abderazek Ben Abdallah, SMIEEE, SMACM

Regent, The University of Aizu
Dean, School of Computer Science and Engineering, The University of Aizu
Professor, School of Computer Science and Engineering, The University of Aizu, Japan
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UoA Faculty Profile: https://u-aizu.ac.jp/research/faculty/detail?cd=90029&lng=en
Laboratory Website: https://web-ext.u-aizu.ac.jp/misc/neuro-eng/index.html
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Contents

EDUCATION

- **2002**: Doctor of Engineering (Dr. Eng.) in Computer Engineering, University of Electro-Communications, Tokyo, Japan
- **1997**: Master of Science (M.S.) in Computer Engineering, Huazhong University of Science and Technology, Wuhan, China
- **1994**: Bachelor of Science (B.S.) in Electrical Engineering, Sfax University (Tunisia) and Huazhong University of Science and Technology, Wuhan, China

ACADEMIC APPOINTMENTS AND UNIVERSITY ADMINISTRATION LEADERSHIP

- **2022–Present**: **Regent**, University of Aizu
  As Regent of the University of Aizu, I serve on the university's highest executive boards, contributing to strategic governance, institutional planning, and academic oversight. I actively participate in the Management Council, Education and Research Council, and other key decision-making bodies, ensuring that academic innovation, operational excellence, and long-term vision are aligned. My role as Regent bridges leadership and policy, supporting the university's mission through collaborative governance and forward-looking institutional development.
- **2022–Present**: **Dean**, School of Computer Science and Engineering, University of Aizu
  As Dean of the School of Computer Science and Engineering at the University of Aizu, I provide strategic leadership in education, academic affairs, faculty development, hiring, and accreditation. I play a central role in shaping educational policies, advancing institutional quality, and fostering a culture of excellence across teaching and research.
- **2014–Present**: Member, Education and Research Council, University of Aizu
- **2022–Present**: Director, Department of Computer Science and Engineering, University of Aizu
- **2014–March 2022**: Head, Computer Engineering Division, University of Aizu
- **2014–Present**: Full Professor, University of Aizu
- **2012–2014**: Senior Associate Professor, University of Aizu
- **2011–2012**: Associate Professor, University of Aizu
- **2007–2011**: Assistant Professor, University of Aizu, Aizu-Wakamatsu, Japan
- **April–September 2007**: Assistant Professor, University of Electro-Communications (UEC), Tokyo, Japan
- **2002–2007**: Research Associate, National University of Electro-Communications (UEC), Tokyo, Japan

RESEARCH INTEREST

- **Computer Architecture:** *Innovative processors, memory, and accelerator architectures emphasizing parallelism, scalability, and energy-efficient execution for next-generation intelligent systems.*
- **Embedded Systems & Software–Hardware Codesign:** *Co-design strategies for high-performance, energy-efficient heterogeneous embedded architectures.*
- **Neuromorphic Computing:** *Computational models, spiking neural networks, and event-driven circuits for intelligent, brain–computer interface (BCI), energy-efficient processing.*
- **Advanced On-Chip Interconnects:** *Scalable 3D NoCs integrating silicon photonics and hybrid technologies for multicore SoCs.*

- **Anthropomorphic Robots:** *Event-driven sensing and processing, HW/SW codesign for humanoid locomotion and manipulation, Continual learning architectures, 3D NoCs for multi-module humanoid cognition*

MAJOR PROFESSIONAL SOCIETY

- **2025–Present**: Member, Sigma Xi, The Scientific Research Honor Society
- **2025**: Member, IEEE CASS Technical Committee on Circuits and Systems Education and Outreach
- **2014–Present**: Senior Member, IEEE
- **2016–Present**: Senior Member, ACM
- **2019–Present**: Member, IEEE Systems Council
- **2020–Present**: Member, IEEE Circuits and Systems Society
- **2011–Present**: Member, IEEE Computer Society Technical Community on Microprocessors and Microcomputers
- **2018–Present**: Member, IEEE Computer Society Technical Community on Computer Architecture
- **2020–Present**: Member, European Alliance for Innovation
- **2002–2018**: Member, IEICE (Institute of Electronics, Information and Communication Engineers), Japan

MAJOR EDITORIAL SERVICE

- **2026–Present**: Associate Editor-in-Chief, *IEEE Computer Magazine*
  Support the EiC in shaping the magazine's editorial direction, ensuring the quality, relevance, and balance of published content. Coordinate the editorial board, oversee the review and selection of feature articles, and contribute to strategic planning aligned with emerging trends and global computing needs.
- **2025–2026**: Lead Guest Editor, *IEEE Computer Magazine*, Special Issue on *Convergence in Neuromorphic Systems: From Circuit Innovation to Adaptive Cognition*
- **2025**: Associate Editor, *IEEE Computer Magazine*
- **2025–2027**: Associate Editor, *IEEE Network Magazine*
- **2025–Present**: Associate Editor, *Neuromorphic Engineering*, *Frontiers in Neuroscience*
- **2025–Present**: Topic Editor, Research Theme: *Computational Neuromorphic Imaging*, *Frontiers in Neuroscience*
- **2025–Present**: Associate Editor, *Journal of Intelligence & Robotics*, OAE Publishing
- **2014**: Guest Editor, *IEEE Transactions on Emerging Topics in Computing*, Special Issue on *Parallel Programming and Architecture Support for Many-core Embedded Systems*
- **2015–Present**: Associate Editor, *Journal of Embedded Systems*
- **2013–2015**: Editor, *Journal of Embedded Systems*
- **2013**: Guest Editor, Special Issue on *Embedded Multicore and Many-core Architectures*, *International Journal of Embedded Systems (IJES)*, InderScience
- **2013–2016**: Editor, *Journal of Convergence Information Technology*
- **2013–2016**: Editor, *Journal of Adaptive and Innovative Systems*

MAJOR REFEREEING

University Faculty Promotion, Tenure Acquisition, and Hiring

- **2014–Present**: Tenure Track Referee, School of Computer Science and Engineering, University of Aizu, Japan
- **2022–Present**: Member, Faculty Promotion, Hiring, and Tenure Committee, School of Computer Science and Engineering, University of Aizu, Japan
- **2024**: Member, Distinguished University Professor Committee, Hamad Bin Khalifa University (HBKU), Qatar
- **2014–2022**: Chair, Faculty Promotion and Tenure Acquisition Committees, University of Aizu, Japan
- **2014–2022**: Chair, Faculty Search Committee and Faculty Promotion and Tenure Acquisition Committees, School of Computer Science and Engineering, University of Aizu, Japan
- **2014–Present**: Member, Faculty Promotion Committee, Graduate School of Computer Science and Engineering, University of Aizu, Japan

Research Grant Agencies

- **2014–Present**: Reviewer, Competitive Research Funding, University of Aizu, Aizu-Wakamatsu, Japan
- **2016–2017**: Reviewer, Research Grants Council (RGC), Local Government of Hong Kong
- **2018–2019**: Reviewer, Austrian Science Fund (FWF), Austria

International Journals and Transactions

- IEEE Computer; IEEE Access; IEEE journal of solid-state circuits; IEEE Network; IEEE transactions on automation science and engineering; IEEE transactions on circuits and systems; IEEE transactions on cognitive and developmental systems; IEEE transactions on computer-aided design of integrated circuits and systems; IEEE transactions on computers; IEEE transactions on

consumer electronics; IEEE transactions on dependable and secure computing; IEEE transactions on device and materials reliability; IEEE transactions on green communications and networking; IEEE transactions on very large scale integration (VLSI) systems; ACM journal on emerging technologies in computing systems; ACM transactions on architecture and code optimization; ACM transactions on embedded computing systems; Concurrency and computation; International journal of circuit theory and applications; IET Journal of Circuits, Devices & Systems; Journal of Supercomputing ; Integration: The VLSI Journal ; Journal of Artificial Life and Robotics (The International Society of Artificial Life and Robotics (ISAROB); Journal of Parallel and Distributed Computing; Frontier in Neuroscience

MAJOR CONFERENCE ORGANIZATION

- **2004–Present**: Founder and Steering Chair, *IEEE Symposium on Embedded Multicore/Manycore Systems-on-Chip (MCSoC) Series*
  Since its inception, I have established and led the IEEE MCSoC Forum, fostering global collaboration in multicore and neuromorphic computing. Under my leadership, the forum has grown into a premier international platform, hosting annual symposiums across Asia, Europe, and North America. These events consistently attract leading researchers, academic institutions, and industry partners, advancing the frontiers of high-performance and intelligent computing through sustained dialogue and innovation.
- **2025**: Program Chair, *7th International Conference on Intelligent Autonomous Systems (ICoIAS'2025)*, December 26–28, Osaka, Japan
- **2025**: Program Chair, *6th International Conference on Circuits, Systems and Devices (ICCSD 2025)*, November 21–23, Shanghai, China
- **2025**: Program Chair, *5th International Conference on Electron Devices and Applications (ICEDA 2025)*, December 19–21, Shenzhen, China
- **2024**: Program Chair, *4th International Conference on Electron Devices and Applications*, October 21–23
- **2021**: Core Program Committee Member (Conference Planning & Organization), *3rd ETLTC2021 ACM Chapter International Conference on Information and Communication Technology*, January 27–30, Aizu-Wakamatsu, Japan
- **2020**: General Chair, *2021 IEEE 14th International Symposium on Embedded Multicore/Manycore SoCs*, Conference No. 51149, July 29, 2020 – December 23, 2021
- **2017**: General Chair, *2017 IEEE 11th International Symposium on Embedded Multicore/Manycore SoCs*, Conference No. 41091, January 10 – September 20
- **2012**: Program Co-chair, *5th International Workshop on Engineering Parallel and Multicore Systems*, July 4–6, Palermo, Italy
- **2009**: Publication Chair, *4th International Conference on Frontiers of Computer Science and Technology (FCST 2009)*, Shanghai
- **2009**: Program Chair, *IEEE International Conference on Embedded Software and Systems*, Hangzhou, Zhejiang, China
- **2007**: General Chair, *3rd International Workshop on Embedded Single and Multicore Systems on Chips*, in conjunction with the 36th ICPP, China
- **2006**: Steering Chair, *2nd International Workshop on SoC and MCSoC Design*, with MoMM 2006, Yogyakarta, Indonesia
- **2006**: General Chair, *8th International Workshop on High-Performance Scientific and Engineering Computing*, Columbus, Ohio, USA, August 18
- **2006**: General Co-chair, *8th International Workshop on High-Performance Scientific and Engineering Computing*, Columbus, Ohio, USA, August 18
- **2005**: Program Co-chair, *International Conference on Computer Design (CDES-05)*, Las Vegas
- **2004**: Program Chair, *Joint Japan–Tunisia Workshop on Computer Systems and Information Technology (JT-CSIT 2004)*, University of Electro-Communications, Tokyo, Japan

MAJOR CONFERENCE TECHNICAL PROGRAM COMMITTEE

- **2010–2022**: IEEE Symposium on Low-Power and High-Speed Chips (COOLChips), Yokohama, Japan
- **2021**: IEEE International Symposium on Circuits and Systems (ISCAS), Daegu, Korea, May 23–26
- **2020**: 20th International Conference on Sciences and Techniques of Automatic Control and Computer Engineering (STA'2020), Monastir, Tunisia, December 20–22
- **2013**: 16th International Conference on Network-Based Information Systems (NBiS 2013), Gwangju, Korea, September 4–6
- **2013**: Computers, Communications and IT Applications Conference (ComComAp 2013), HKUST, Hong Kong, April 1–4
- **2013**: 6th International Workshop on Engineering Parallel and Multicore Systems, Taichung, Taiwan, July 3–5
- **2013**: IEEE Symposium on Low-Power and High-Speed Chips (COOLChips XVI), Yokohama, April 17–19
- **2012**: IEEE Symposium on Low-Power and High-Speed Chips (COOLChips XV), Yokohama, April 18–20
- **2011**: IEEE Symposium on Low-Power and High-Speed Chips (COOLChips XIV), Yokohama, April 20–22
- **2010**: IEEE Symposium on Low-Power and High-Speed Chips (COOLChips XIII), Yokohama, April 14–16
- **2009**: 19th Intelligent System Symposium (FAN 2009), Aizu-Wakamatsu, Japan

- **2009**: 4th International Symposium on Embedded Multicore Systems-on-Chip (MCSoC-09), Vienna, Austria
- **2009**: IEEE 8th International Conference on Embedded Computing, Dalian, China
- **2008**: IEEE 9th International Conference on Computational Science and Engineering, Brazil
- **2008**: IEEE 5th International Symposium on Embedded Computing, Beijing, China
- **2008**: International Workshop on Intelligent Interfaces for Human-Computer Interaction (IIHCI-2008)
- **2008**: International Conference on Communication Systems and Networks
- **2008**: International Conference on Embedded Software and Systems (ICESS 2008), Chengdu, China, July 29–31
- **2007**: IFIP International Conference on Embedded and Ubiquitous Computing, Taipei
- **2007**: 2nd International Workshop on Embedded Software Optimization (ESO 2007), Taipei
- **2007**: International Conference on Intelligent Pervasive Computing, Korea
- **2007**: International Workshop on Embedded System Architectures for Pervasive Devices and Computers (WESAPEC 2007), Korea
- **2007**: International Conference on Communication Systems and Networks (AsiaCSN 2007), Thailand
- **2006**: 3rd IASTED International Conference on Communications and Computer Networks (CCN 2006), Peru
- **2006**: 1st International Workshop on Embedded Software Optimization (ESO 2006), Korea
- **2005**: International Conference on Embedded and Ubiquitous Computing (EUC 2005), Nagasaki, Japan
- **2005**: 20th ACM Symposium on Applied Computing, USA
- **2004**: International Conference on Embedded Systems and Applications
- **2004**: Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA'04), USA
- **2004**: International Conference on VLSI (VLSI'04), Las Vegas, Nevada, USA
- **2004**: Communication and Computer Networks (CCN 2004), USA

MAJOR GOVERNMENT BODIES/ADVISORY BOARDS

- **2009–2011**: Member, High-Level Committee for Science and Technology under the Prime Minister of the Government of Tunisia
- **2018–2019**: Member, Review Committee, Austrian Science Fund (FWF), Austria
- **2017–2018**: Member, Ph.D. Review Committee, University of Otago, New Zealand
- **2016–2017**: Member, Research Grants Council (RGC), Local Government of Hong Kong
- **2014–2015**: Member, Ph.D. Review Committee, Murdoch University, Australia
- **2010–2013**: Member, Scientific Innovation Council, TELNET Co., Ltd

MAJOR UNIVERSITY SERVICE AND COMMITTEES AT UOA AND UEC

- **2022–Present**: Regent and Dean, University of Aizu
- **2022–Present**: Director, Department of Computer Science and Engineering, University of Aizu
- **2014–Present**: Member, Education and Research Council, University of Aizu
- **2022–Present**: Chair, Faculty Assembly, University of Aizu
- **2022–Present**: Chair, Academic Affairs Committee, University of Aizu
- **2022–Present**: Chair, Faculty Development Committee, University of Aizu
- **2022–Present**: Chair, Student–Professor Opinion Exchange Forum, University of Aizu
- **2022–2024**: Chair, Public Relations and Website Working Group, University of Aizu
- **2014–2022**: Chair, Qualification Examination Committee for Tenure Acquisition, Division of Computer Engineering, University of Aizu
- **2024–2025**: Chair, Committee for Harassment Prevention, University of Aizu
- **2022–Present**: Member, Graduate Program Instructor Qualification Examination, Graduate School of Computer Science and Engineering, University of Aizu
- **2020–2021**: Vice Chairperson, Investigation Committee on Misconduct in Research Activities, University of Aizu
- **2022–Present**: Member, Faculty Hiring Committee, University Business Innovation Center (UBIC), University of Aizu
- **2024–Present**: Member, Faculty Hiring, Tenure, and Promotion Committee, Center for Cultural Research and Studies, University of Aizu
- **2022–2024**: Member, Committee for Harassment Prevention, University of Aizu
- **2014–2022**: Chair, Faculty Hiring, Tenure, and Promotion Committee, Computer Engineering Division, University of Aizu
- **2014–2022**: Member, Honorary/Distinguished Professor Committee, University of Aizu
- **2014–Present**: Member, Cooperative Research Acceptance Deliberation Committee, University of Aizu
- **2014–2022**: Member, Employment Duty–Related Invention Deliberation Committee, University of Aizu
- **2015–2016**: Member, Faculty Search Executive Council, University of Aizu
- **2014–Present**: Member, Faculty Hiring and Proportion Committee, Center for Language Research, University of Aizu
- **2011–2013**: Member, Faculty Development Committee, University of Aizu
- **2008–2010**: Member, Academic Affairs Committee, University of Aizu
- **2008–2010**: Member, Graduate School Curriculum Reorganizing Working Group, University of Aizu

- **2008–Present**: Member, Graduate School Entrance Examiner, University of Aizu
- **2008–2013**: Member, Entrance Examination Proctor, University of Aizu, Aizu-Wakamatsu, Japan
- **2004–2006**: Member, Website and Publication Relations Committee, University of Electro-Communications, Tokyo
- **2002–2007**: Member, Entrance Examination Proctor, University of Electro-Communications, Tokyo, Japan

INTERNATIONAL DISTINCTION AND HONOR

- **Full Member**, Sigma Xi, The Scientific Research Honor Society, July 08, 2025
  Sigma Xi was founded at Cornell University in 1886 and is a traditional academic society whose members have included researchers who have made significant contributions to advancing science, such as Albert Einstein and Barbara McClintock. Membership is by invitation only, and researchers with outstanding research achievements or potential are recommended and approved following a review process.
- **Senior Member**, IEEE since 2014
- **Senior Member**, ACM since 2016
- **National President Award for Best Tunisian Researcher living abroad,** 2010.
  Prize given by the Tunisian President in a ceremony at the Presidential Palace, with a maximum of one award given every year based upon a review by a national committee.
- **Member**, High-Level Committee for Science and Technology Under the Prime Minister of the Government of Tunisia*, 2009-2011*
- **Prime Minister's High-Level Committee**
  Advised the Tunisian government on key strategies for science and technology policy, focusing on leveraging global expertise for national development. As an advisory member responsible for ICT under the Prime Minister of Tunisia, I contributed to the High-Level Committee for Science and Technology, which played a central role in shaping national strategies for advancing the ICT sector. Operating under the auspices of the Prime Minister's Office, the committee provided high-level guidance and policy recommendations to strengthen Tunisia's science and technology ecosystem, foster innovation, and leverage digital transformation to drive sustainable economic growth and societal development. (Read mode details at Leaders Magazine (in French)).
- **Certificate of Appreciation** from the Ambassador of Tunisia to Tokyo, 2010
- **Outstanding Achievement Award**, Huazhong University of Science and Technology (HUST), Wuhan, China, 1994
- **Outstanding Achievement Award**, Huazhong University of Science and Technology (HUST), Wuhan, China, 1993
  Awarded to the top-performing foreign student for exceptional academic performance.
- **Certificate of Appreciation**, 17th IEEE MCSoC 2024, Dec. 16-19, 2024, Kuala Lumpur, Malaysia, 2025
- **23 keynotes**, invited courses, and invited lectures worldwide

BEST PAPER AWARDS, BEST BOOK AWARDS

1. **Abderazek Ben Abdallah, Khanh N. Dang** – *Neuromorphic Computing Principles and Organization*, Springer (1st ed., 2022), selected as **Best Neuromorphic Computing Books of All Time**, BookAuthority, June 2025.
2. **Jiangkun Wang, Khanh N. Dang, Abderazek Ben Abdallah** – "Scaling Deep-Learning Pneumonia Detection Inference on a Reconfigurable Self-Contained Hardware Platform," **IEEE ICET 2023**, May 12–15, 2023.
3. **Ogbodo Mark Ikechukwu, Khanh N. Dang, Abderazek Ben Abdallah** – "Energy-efficient Spike-based Scalable Architecture for Next-generation Cognitive AI Computing Systems," **LNCS, UNET 2021**, May 19–22, 2021, Marrakesh, Morocco.
4. **Sinchhean Phea, Zhishang Wang, Jiangkun Wang, Abderazek Ben Abdallah** – "Optimization and Implementation of a Collaborative Learning Algorithm for an AI-Enabled Real-time Biomedical System," **ETLTC2021–ACM Chapter ICT Conference**, Jan 27–30, 2021, Aizu-Wakamatsu, Japan; SHS Web Conf. 102 (2021) 04017.
5. **The H. Vu, Abderazek Ben Abdallah** – "A Low-latency K-means based Multicast Routing Algorithm and Architecture for Three-Dimensional Spiking Neuromorphic Chips," **IEEE BigComp 2019**, Kyoto, Japan, Feb 28 – Mar 2, 2019.
6. **A. Ben Ahmed, A. Ben Abdallah, K. Kuroda** – "Architecture and Design of Efficient 3D Network-on-Chip (3D NoC) for Custom Multicore SoCs," **IEEE BWCCA 2010**, Nov 2010.
7. **M. Masuda, A. Canedo, A. Ben Abdallah** – "Efficient Code Generation Algorithm for Natural Instruction Level Parallelism-aware Queue Architecture," **FAN 2009**, pp. 308–313, Sep 2009.
8. **Arquimedes Canedo, Abderazek Ben Abdallah, Masahiro Sowa** – "New Code Generation Algorithm for QueueCore – An Embedded Processor with High ILP," **PDCAT 2007**, Adelaide, Australia, Dec 3–6, 2007.

KEYNOTES AND PLENARY TALKS

Keynote & Invited Talks

- **"Distributed Autonomy Meets Neuromorphic Intelligence"** – ICoIAS'2025, Osaka, Japan.
- **"Toward Sustainable Power: Intelligent Energy Harvesting with ICT and Electric Vehicles"** – FREA–UoA Joint Forum, The University of Aizu, Nov 27, 2025.
- **"Development of Application-Specific AI Chips: Creating Regionally Needed AI at the University – Neuromorphic AI Chips"** – AIZU IT AKI Forum, Nov 27, 2023.

- **"Brain-inspired Systems for AI at the Edge"** – JICA–UoA–ISTIC, Jan 2023.
- **"UoA Energy-Related Research"** – Kyoto Institute of Technology, Oct 2022.
- **"Neuromorphic Computing"** – STA'2020, Tunisia.
- **"Energy Management System with AI-Chip and EVs"** – AI Symposium, Nov 2019.
- **"The Future of Machine Learning"** – ICCES'2019, Hammamet.
- **"Neuromorphic Chips for AI at the Edge"** – MLDAS 2019, Doha.
- **"AI Chips for Intelligent Systems"** – ICoIAS'2019, Singapore.
- **"AI Chips: From Data Centers to Edge"** – AI Symposium, University of Aizu, Dec 2018.
- **"Neuro-inspired Computing Systems"** – ICoIAS'2018, Singapore.
- **"Mindset for Innovation & Entrepreneurship"** – ACM Seminar, University of Aizu, Nov 2017.
- **"Neuro-Inspired Adaptive Manycore SoCs"** – ICCAR 2017, Nagoya.
- **"Adaptive SoCs for Smart Autonomous Systems"** – STA2016, Sousse.
- **"Heterogeneous Systems for Future Computing"** – AUST Conference, Oct 2015.
- **"Si-Photonics for Optical Communication"** – STA2014, Sousse.
- **"On-Chip Optical Interconnects"** – SoCPAR2014, Aug 2014.
- **"Smart Systems for Wireless Body Area Networks"** – IEEE PCSJ, Nov 2013.

TEACHING

Courses at the University of Aizu

1. **Computer Architecture**, Undergraduate level, The University of Aizu, 2018–present.
2. **Introduction to Computer Systems**, Undergraduate level, The University of Aizu, 2018–present.
3. **Neuromorphic Computing**, Graduate level, The University of Aizu, 2018–present.
4. **Parallel Computer Systems**, Undergraduate level, The University of Aizu, 2018–present.
5. **Introduction to Computer Science and Engineering**, Undergraduate level, The University of Aizu, 2022–present.
6. **Advanced Computer Organization**, Graduate level, The University of Aizu, 2008–2020.
7. **SCCP-001 – System-on-Chip Design**, Undergraduate level, The University of Aizu, 2009–2010.
8. **Computer System Engineering**, Undergraduate level, The University of Aizu, 2008–2018.
9. **Embedded Systems**, Undergraduate level, The University of Aizu, 2008–2016.
10. **Logic Circuit Design Exercises**, Undergraduate level, The University of Aizu, 2008–2018.
11. **Computer Architecture Exercises**, Undergraduate level, The University of Aizu, 2008–2018.
12. **Multicore Computing**, Graduate level, The University of Aizu, 2010–2015.
13. **Embedded Real-Time Systems**, Graduate level, The University of Aizu, 2008–2020.

Courses at Other Universities

14. **Huazhong University of Science and Technology (HUST), Wuhan, China** – Visiting Professor for an invited intensive course, 2011–2016.
15. **African University of Science and Technology** – Visiting Professor for an invited intensive course, 2008–2016.
16. **Hong Kong University of Science and Technology, Hong Kong** – Visiting Professor for invited intensive lectures, 2010–2013.

Invited Lecturer

17. **Tokyo University of Foreign Studies** – Invited Lecturer, *Grid Technology with ICT and EV*, Tokyo, Japan, 2024–present.
18. **Kyoto Institute of Technology** – Invited Lecturer, *Hardware-Oriented Neurocomputing*, Graduate School of Science and Technology, Kyoto, Japan, 2022–present.

PATENTS

Registered Patents

1. **Patent No. 7699791** (June 20, 2025) – Abderazek Ben Abdallah, Huankun Huang, Nam Khanh Dang, Jiangning Song, *AI Processor*, Application No. 2020-194733 (Nov 24, 2020)
2. **Patent No. 7659250** (April 1, 2025) – Abderazek Ben Abdallah, Khanh N. Dang, Masayuki Hisada, *Multiple error detection circuit detecting multiple errors in multiple links and error correction circuit having multiple error detection circuit*, Application No. 2020-171553
3. **Patent No. 7488989** (May 23, 2024) – Abderazek Ben Abdallah, Khanh N. Dang, *A three-dimensional system on chip in which a TSV group including a plurality of TSVs connects between layers*, Application No. 2020-094220
4. **Patent No. 7239099** (March 14, 2023) – Abderazek Ben Abdallah, Khanh N. Dang, Masayuki Hisada, *A TSV fault-tolerant router system for 3D Networks-on-Chip*, Application No. 2017-218953
5. **Patent No. 7277682** (May 11, 2023) – Abderazek Ben Abdallah, The H. Vu, Masayuki Hisada, *Spiking Neural Network by 3D Network-on-Chip*, Application No. 2019-124541 (July 3, 2019)
6. **Patent No. 6846027** (March 3, 2021) – Abderazek Ben Abdallah, *Defect-tolerant router for network-on-chip*, Application No. 2016-100732 (May 19, 2016)

7. **Patent No. 6804072** (December 4, 2020) – Abderazek Ben Abdallah, Masayuki Hisada, *Virtual Power Platform Control System*, Application No. 2020-033678 (Feb 28, 2020)
8. **Patent No. 6747660** (November 8, 2020) – Abderazek Ben Abdallah, *Setup method for an optical network-on-chip system using non-blocking optical switches, each having a control unit*, Application No. 2015-196698 (Oct 2, 2015)
9. **Patent No. 6284177** (February 9, 2018) – Abderazek Ben Abdallah, *Fault-tolerant router, IC using it, and control method for fault-tolerant router*, Application No. 2013-262523 (Dec 19, 2013)

Provisional Patents

1. **Application No. 2022-022472** – Abderazek Ben Abdallah, Wang Zhishang, Masayuki Hisada, *An electricity trading system and an electricity trading method*
2. **Application No. 2022-196416** – Khanh N. Dang, Abderazek Ben Abdallah, *Program for generating migration flows for homogeneous computing systems and homogeneous computing devices*
3. **Application No. 2023-020162** – Abderazek Ben Abdallah, Wang Zhishang, Khanh N. Dang, Masayuki Hisada, *EV Power Consumption Prediction Method and System for Power Management in Smart Grid*
4. **Application No. 2024-047372** (March 22, 2024) – Khanh N. Dang, Abderazek Ben Abdallah, Nguyen Ngo Doanh, *Neural Network Processor*
5. **Application No. 2024-056380** (March 29, 2023) – Abderazek Ben Abdallah, Zhishang Wang, K. N. Dang, Masayuki Hisada, *Lacquering Robot System*

GRANTS

1. **Z. Wang, Abderazek Ben Abdallah (Co-PI)** – Competitive Research Funding, Ref. CRF-P37: *Research and Development of a Neuromorphic Android System with Multi-Modal Sensing and Distributed Intelligence.*
2. **Dang Nam Khanh, Abderazek Ben Abdallah (Co-PI), Z. Wang, D. Suzuki** – Competitive Research Funding, Ref. CRF-P21: *Research and Development in Neuromorphic AI for an Anthropomorphic Android to Achieve a Human-Centered AI Society.*
3. **Abderazek Ben Abdallah (PI), Dang Nam Khanh** – Competitive Research Funding, Ref. P7.2024.2025: *Development of a Non-invasive Sensory Neuromorphic Prosthesis Hand for Amputees with Touch and Movement Sensations.*
4. **Abderazek Ben Abdallah (PI), Dang Nam Khanh** – Competitive Research Funding, Ref. P6.2022.2023: *Development of a Non-invasive Sensory Neuromorphic Prosthesis Hand for Amputees with Touch and Movement Sensations.*
5. **Abderazek Ben Abdallah (PI), Dang Nam Khanh** – Competitive Research Funding, Ref. P6.2022.2023: *Development of a Non-invasive Sensory Neuromorphic Prosthesis Hand for Amputees with Touch and Movement Sensations.*
6. **Abderazek Ben Abdallah (PI)** – Competitive Research Funding, Ref. P5 (2020): *Development of Energy-efficient Real-time Heterogeneous Spiking Neuro-inspired System for Deep Neural Networks.*
7. **Masayuki Hisada, Abderazek Ben Abdallah (Co-Investigator)** – Fukushima R&D Program, Fund for Renewable Energy Technology (Grant-682), 2020–2021: *Neural network modeling for an energy management system and its implementation on FPGA.*
8. **Masayuki Hisada, Abderazek Ben Abdallah (Co-Investigator)** – Fukushima R&D Program, Fund for Renewable Energy Technology (Grant-682), 2019–2020: *Neural network modeling for an energy management system and its implementation on FPGA.*
9. **Abderazek Ben Abdallah (PI)** – Competitive Research Funding, Ref. P5 (2019): *Development of Energy-efficient Real-time Heterogeneous Spiking Neuro-inspired System for Deep Neural Networks.*
10. **Abderazek Ben Abdallah (PI)** – Competitive Research Funding, Ref. P3 (2018): *Development of Energy-efficient Real-time Heterogeneous Spiking Neuro-inspired System for Deep Neural Networks.*
11. **Abderazek Ben Abdallah (PI)** – Competitive Research Funding, Ref. P2 (2017): *Development of Energy-efficient Real-time Heterogeneous Spiking Neuro-inspired System for Deep Neural Networks.*
12. **Abderazek Ben Abdallah (PI)** – Competitive Research Funding, Ref. H26-27: *Photonic 3D-Network-on-Chip for High-throughput Many-core Systems.*
13. **Abderazek Ben Abdallah (PI)** – Competitive Research Funding, Ref. H23-25: *High-Radix Network-on-Chip Architecture for Future Many-Core Systems.*
14. **Abderazek Ben Abdallah (PI)** – Competitive Research Funding, Ref. H20-22: *Embedded Wireless Sensor Network System for Elderly Health Monitoring.*
15. **Deboprio Roy (PI), Abderazek Ben Abdallah (Co-Investigator)** – JSPS Kakenhi, Project No. 30453020 (2015–2017): *3D Printing in Creative Factory Contexts for English Language Learning.*
16. **Tsutomo Yoshinaga (PI), Abderazek Ben Abdallah (Co-Investigator)** – JSPS Grant-in-Aid for Scientific Research (C), Project No. 15500033 (2003–2005): *A Study of Fault-tolerant and Adaptive Routing Networks.*
17. **Abderazek Ben Abdallah (PI)** – University of Electro-Communications, Ref. UEC XB23 (2002–2004): *Functional Assignment Register Microprocessor.*

RESEARCH SUPERVISION AND GRADUATE STUDENTS TRAINING

It has been my privilege to supervise a diverse group of exceptionally talented graduates and undergraduate students. Their remarkable research achievements have led to publications in top-tier journals and conferences. Many have pursued successful careers across industry, academia, and innovative start-ups, establishing themselves in various countries including Japan, China, Vietnam, USA, Tunisia, Taiwan, Cambodia, Myanmar, Nigeria, Hong Kong, and beyond.

Category	Number Supervised	Notes
Postdoctoral Fellows	4	Direct supervision
Ph.D. Candidates	11	Supervised to completion or in progress
Master's Students	24	Supervised theses and research projects
Bachelor's Theses	40+	Undergraduate final-year projects
External Ph.D. Examinations	Multiple	Including Univ. of Otago (New Zealand), Univ. of Aizu (Japan)
Total Graduate/Postdoc Mentees	**75+**	Across global institutions

Postdoctoral Fellows Supervision (Completed)

1. Dr. WANG Zhishang (China) Currently an Assistant Professor at the University of Aizu, Aizu-Wakamatsu, Japan (2023/4 - 2025/3)
2. Dr. OGBODO Ikechukwu (Nigeria) Currently studying his M.B.A. at Auburn University and leading a Startup, U.S.A. (2022).
3. Dr. DANG N. Khanh (Vietnam) Currently an Associate Professor at the University of Aizu, Aizu-Wakamatsu, Japan (2019, 2020)
4. Dr. HUANG Huakun (China) Currently an Associate Professor at Guangzhou University, School of Computer Science and Cyber Engineering, China (2020)

Ph.D. Theses Supervised

1. MAATAR Mohamed, ''Mapping Algorithms and Architectures Towards the Design of a Thermal-Aware Fault-Tolerant 3D-NoC-Based Neuromorphic Systems", Ph.D. Degree, Graduate School of Computer Science and Engineering, The University of Aizu,9/2025
2. WILLIAMS Yerima," Architecture and Algorithms for Robust Reconfigurable Neuromorphic Systems', Ph.D. Degree, Graduate School of Computer Science and Engineering, The University of Aizu,3/2024
3. LIANG Yuxiao, ''Trustworthy Energy Trading System and Algorithms in Distributed Vehicle-to-Grid Network', Ph.D. Degree, Graduate School of Computer Science and Engineering, The University of Aizu,3/2024
4. WANG Jiangkun, ''Trustworthy AI-Enabled System and Algorithms for Power-Management in Network of Electric Vehicles, Thesis, School of Computer Science and Engineering, The University of Aizu, 10/2023
5. WANG Zhishang, ''Trustworthy AI-Enabled System and Algorithms for Power-Management in Network of Electric Vehicles'', Ph.D. Degree, Graduate School of Computer Science and Engineering, The University of Aizu,3/2023
6. Mark Ogbodo,' On the Design of Adaptive Digital Neuromorphic System'', Ph.D. Degree, Graduate School of Computer Science and Engineering, The University of Aizu, 3/2022
7. Vu Huy The, 'Algorithms and Architectures for Spiking Neuromorphic Systems," Ph.D. Thesis, Graduate School of Computer Science and Engineering, The University of Aizu, 9/2019
8. Nam Khanh Dang," Development of On-Chip Communication Fault-Resilient Adaptive Architectures and Algorithms for 3D-IC Technologies", Ph.D. Thesis, Graduate School of Computer Science and Engineering, The University of Aizu, 9/2017.
9. Michael Meyer," Micro-ring Fault-resilient Photonic On-chip Network for Reliable High-performance Many-core Systems-on-Chip", Ph.D. Thesis, Graduate School of Computer Science and Engineering, The University of Aizu, March 2017.
10. Achraf Ben Ahmed, High-performance, Scalable Photonics On-chip Network for Many-core Systems-on-Chip, Ph.D. Thesis, Graduate School of Computer Science and Engineering, The University of Aizu, March 2016
11. Akram Ben Ahmed, High-throughput Architecture and Routing Algorithms Towards the Design of Reliable Mesh-based Many-Core Network-on-Chip Systems, Ph.D. Thesis, Graduate School of Computer Science and Engineering, University of Aizu, March 2015

Master of Science Theses Supervised

1. Aung Myint Myat, M.S. Degree, Graduate School of Computer Science and Engineering, The University of Aizu, 3/2025
2. NGUYEN Ngo Doanh, M.S. Degree, Graduate School of Computer Science and Engineering, The University of Aizu, 3/2024
3. CHENG Hong, M.S. Degree, Graduate School of Computer Science and Engineering, The University of Aizu, 9/2023
4. PHEA Sinchhean, M.S. Degree, Graduate School of Computer Science and Engineering, The University of Aizu, 3/2023
5. AOYAMA Naoki, M.S. Degree, Graduate School of Computer Science and Engineering, The University of Aizu, 3/2023
6. OKADA Yuki, M.S. Degree, Graduate School of Computer Science and Engineering, The University of Aizu, 3/2023

7. NAKAMURA Miyuka, M.S. Degree, Graduate School of Computer Science and Engineering, The University of Aizu, 3/2022
8. LU Yu-Ming, M.S. Degree, Graduate School of Computer Science and Engineering, The University of Aizu, 9/2020
9. FUKUCHI Tomohide, M.S. Degree, Graduate School of Computer Science and Engineering, The University of Aizu, 9/2020
10. Yuji Murakami, M.S. Degree, Graduate School of Computer Science and Engineering, The University of Aizu, 3/2019
11. Ryunosuke Murakami, M.S. Degree, Graduate School of Computer Science and Engineering, The University of Aizu, 9/2019
12. Akihito Kajikawa, M.S. Degree, Graduate School of Computer Science and Engineering, The University of Aizu, 3/2019
13. Yumiko Kimezawa, M.S. Degree, Graduate School of Computer Science and Engineering, The University of Aizu, 3/2013
14. Achraf Ben Ahmed, M.S. Degree, Graduate School of Computer Science and Engineering, The University of Aizu, 3/2013
15. Kenichi Mori, M.S. Degree, Graduate School of Computer Science and Engineering, The University of Aizu, 3/2012
16. Shohei Miura, M.S. Degree, Graduate School of Computer Science and Engineering, The University of Aizu, 3/2012
17. Akram Ben Ahmed, M.S. Degree, Graduate School of Computer Science and Engineering, The University of Aizu, 3/2012
18. Hiroki Hoshino, M.S. Degree, Graduate School of Computer Science and Engineering, The University of Aizu, 3/2011
19. Taichi Maekawa, M.S. Degree, Graduate School of Computer Science and Engineering, The University of Aizu, 3/2011
20. Masashi Masuda, M.S. Degree, Graduate School of Computer Science and Engineering, The University of Aizu, 3/2011
21. Dorothy Maduagwu, Performance Evaluation of Queue Processor Vs. RISC Architecture, MS Thesis, AUST University, 2010.
22. Aminu Mahdi, Effective Dynamic Remapping Algorithm for low power Network-on-Chip (NoC), MS Thesis, AUST University, 2010.
23. Dwumfour Abdullai, Designing a Runtime Simulator for QueueCore Processor, MS Thesis, AUST University, 2010.
24. Aliu Sunday Jhon, AFRIHEALTH Care Monitoring System Using Multicore System on Chip Electrocardiography, MS Thesis, AUST University, 2010.

B.S. Theses Supervised

1. YIU Kit Sum, School of Computer Science and Engineering, The University of Aizu, 9/2025
2. KANEKO Kaisei, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2025
3. KOMEDA Takeshi, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2025
4. MIYAZAWA Haruki, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2024
5. OKOCHI Kengo, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2024
6. YAJIMA Yu, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2023
7. SAIKAWA Yamato, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2022
8. WATANABE Masaki, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2022
9. AGEISHI Naoto, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2021
10. AOYAMA Naoki, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2021
11. OKADA Yuki, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2021
12. PHEA Sinchhean, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2021
13. Nakamura, Miyuka, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2020
14. Saito, Jun, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2020
15. Yamashita, Eiji, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2020
16. Shinji Hironaka, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2019
17. Yoshiki Tanaka, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2019
18. Masaki Yamada, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2018
19. Kanta Suzuki B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2018
20. Kosuke Takakuwa, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2018
21. Yuji Murakami, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2017
22. Kajikawa, Akihito, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2016
23. Saito, Ken, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2016O
24. kada, Ryoga, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2016
25. Mitsunari Ishii, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2015
26. Yuuki Tanaka, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2015
27. Takayuki Ochi, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2013
28. Shuu Endou, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2013
29. Ryuya Okada, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2012
30. Tomotaka Kasahara, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2012
31. Takahiro Uesaka, B.S. Degree, School of Computer Science and Engineering, the University of Aizu, 3/2011
32. Shunichi Kato, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2011
33. Yumiko Kimezawa, B.S. Degree, School of Computer Science and Engineering, the University of Aizu, 3/2011
34. Yuuki Omoto, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2010
35. Haga Yasuyoshi, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2010

36. Reo Honjoya, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2010
37. Mori Kenichi, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2010
38. Miura Shohei, B.S. Degree, School of Computer Science and Engineering, the University of Aizu, 3/2010
39. Masashi Masuda, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2009
40. Hiroki Hoshino, B.S. Degree, School of Computer Science and Engineering, The University of Aizu, 3/2009
41. Tachi Maekawa, B.S. Degree, School of Computer Science and Engineering, the University of Aizu, 3/2009

Ph.D. Theses Supervised (In Progress)

Currently none.

Bachelor Theses (In Progress)

1. MURAKAMI Ayato, School of Computer Science and Engineering, The University of Aizu (3/2026 - expected)
2. NAKAGAWA Hitoshi, School of Computer Science and Engineering, The University of Aizu (6/2026 - expected)
3. NAGAI Hiromu, School of Computer Science and Engineering, The University of Aizu (3/2027 - expected)
4. UEKI Eisuke, School of Computer Science and Engineering, The University of Aizu (3/2027 - expected)

RESEARCH PUBLICATIONS

Books

1. Abderazek Ben Abdallah (Author), Khanh N. Dang (Author), "**Neuromorphic Computing Principles and Organization, 2nd Edition**, **Publisher**: Springer; Second Edition 2025. Link: https://link.springer.com/book/9783031830884, **Publication date**: Q1, 2025, **ISBN-10**: 3031830881, **ISBN-13:** 978-3031830884
2. Abderazek Ben Abdallah (Author), Khanh N. Dang (Author), "**Neuromorphic Computing Principles and Organization, Publisher**: Springer; 1st ed. 2022 edition (June 2, 2022). Link: https://link.springer.com/book/10.1007/978-3-030-92525-3, **Publication date**: June 2, 2022
   ISBN-10: 3030925242, **ISBN-13**: 978-3030925246
3. Abderazek Ben Abdallah (Author), "**Advanced Multicore Systems-on-Chip: Architecture, On-Chip Network, Design**", **Publisher**: Springer; Softcover reprint of the original 1st ed. 2017 edition (December 9, 2018). Link: https://link.springer.com/book/10.1007/978-981-10-6092-2
   Publication date: December 9, 2018, **ISBN-10**: 9811355657, **ISBN-13**: 978-9811355653
   ****Translation**: This book has been also translated to Chinese
4. Abderazek Ben Abdallah (Author), "**Multicore Systems-on-Chip: Practical Hardware/Software Design", Publisher**: Atlantis Press; 2013th edition (August 5, 2013). Link: https://link.springer.com/book/10.2991/978-94-91216-92-3, **Publication** date: August 5, 2013
   ISBN-10: 9491216910, **ISBN-13**: 978-9491216916

Refereed Journal Publications

1. Ryoji Kobayashi1, Ngo-Doanh Nguyen, Abderazek Ben Abdallah, Nguyen Anh Vu Doan and Khanh N. Dang, "ApproxiMorph: Energy-efficient Neuromorphic System with Layer-wise Approximation of Spiking Neural Networks and 3D-Stacked SRAM", IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, 2025 (in press)
2. N. -D. Nguyen, K. N. Dang, A. B. Ahmed, A. Ben Abdallah and X. -T. Tran, "NOMA: A Novel Reliability Improvement Methodology for 3-D IC-based Neuromorphic Systems," IEEE Transactions on Components, Packaging and Manufacturing Technology, doi: 10.1109/TCPMT.2024.3488113.
3. M. Maatar, Z. Wang, K. N. Dang and A. Ben Abdallah, "BTSAM: Balanced Thermal-State-Aware Mapping Algorithms and Architecture for 3D-NoC-Based Neuromorphic Systems," IEEE Access, vol. 12, pp. 126679-126692, 2024
4. K. N. Dang, N. A. V. Doan, N. -D. Nguyen and A. B. Abdallah, "HeterGenMap: An Evolutionary Mapping Framework for Heterogeneous NoC-Based Neuromorphic Systems," IEEE Access, vol. 11, pp. 144095-144112, 2023
5. Y. Liang, Z. Wang and A. Ben Abdallah, "Robust Vehicle-to-Grid Energy Trading Method Based on Smart Forecast and Multi-Blockchain Network," IEEE Access, vol. 12, pp. 8135-8153, 2024, doi: 10.1109/ACCESS.2024.3352631.
6. Z. Wang, M. Hisada and A. Ben Abdallah, "A Hybrid Clustered Approach for Enhanced Communication and Model Performance in Blockchain-Based Collaborative Learning," IEEE Access, vol. 12, pp. 16975-16988, 2024, doi: 10.1109/ACCESS.2024.3359272.
7. N. -D. Nguyen, A. B. Ahmed, A. Ben Abdallah and K. N. Dang, "Power-Aware Neuromorphic Architecture with Partial Voltage Scaling 3-D Stacking Synaptic Memory," in IEEE Transactions on Very Large-Scale Integration (VLSI) Systems, vol. 31, no. 12, pp. 2016-2029, Dec. 2023, doi: 10.1109/TVLSI.2023.3318231.
8. W. Y. Yerima, K. N. Dang and A. B. Abdallah, "R-MaS3N: Robust Mapping of Spiking Neural Networks to 3D-NoC-Based Neuromorphic Systems for Enhanced Reliability," IEEE Access, vol. 11, pp. 94664-94678, 2023, doi: 10.1109/ACCESS.2023.3311031.
9. N. -D. Nguyen, X. -T. Tran, A. B. Abdallah and K. N. Dang, "An In-Situ Dynamic Quantization With 3D Stacking Synaptic Memory for Power-Aware Neuromorphic Architecture," IEEE Access, vol. 11, pp. 82377-82389, 2023, doi: 10.1109/ACCESS.2023.3301560.

10. W. Y. Yerima, O. M. Ikechukwu, K. N. Dang and A. Ben Abdallah, "Fault-Tolerant Spiking Neural Network Mapping Algorithm and Architecture to 3D-NoC-Based Neuromorphic Systems," IEEE Access, vol. 11, pp. 52429-52443, 2023, doi: 10.1109/ACCESS.2023.3278802.
11. Y. Liang, Z. Wang and A. B. Abdallah, "V2GNet: Robust Blockchain-Based Energy Trading Method and Implementation in Vehicle-to-Grid Network," IEEE Access, vol. 10, pp. 131442-131455, 2022, doi: 10.1109/ACCESS.2022.3229432.
12. Wang, Jiangkun, Ogbodo Mark Ikechukwu, Khanh N. Dang, and Abderazek Ben Abdallah, "Spike-Event X-ray Image Classification for 3D-NoC-Based Neuromorphic Pneumonia Detection" Electronics 11, no. 24: 4157.
13. Z. Wang and A. Ben Abdallah, "A Robust Multi-Stage Power Consumption Prediction Method in a Semi-Decentralized Network of Electric Vehicles," IEEE Access, vol. 10, pp. 37082-37096, 2022, doi: 10.1109/ACCESS.2022.3163455[13].
14. K. N. Dang, N. A. V. Doan and A. Ben Abdallah, "MigSpike: A Migration Based Algorithms and Architecture for Scalable Robust Neuromorphic Systems," IEEE Transactions on Emerging Topics in Computing, vol. 10, no. 2, pp. 602-617, 1 April-June 2022, doi: 10.1109/TETC.2021.3136028.
15. Abderazek Ben Abdallah, Khanh N. Dang, "Toward Robust Cognitive 3D Brain-inspired Cross-paradigm System," Frontier in Neuroscience 15:690208, doi: 10.3389/fnins.2021.690208.
16. K. N. Dang, A. B. Ahmed, A. B. Abdallah and X. -T. Tran, "HotCluster: A Thermal-Aware Defect Recovery Method for Through-Silicon-Vias Toward Reliable 3-D ICs Systems," IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, vol. 41, no. 4, pp. 799-812, April 2022, doi: 10.1109/TCAD.2021.3069370.
17. O. M. Ikechukwu, K. N. Dang and A. B. Abdallah, "On the Design of a Fault-Tolerant Scalable Three-Dimensional NoC-Based Digital Neuromorphic System with On-Chip Learning," IEEE Access, vol. 9, pp. 64331-64345, 2021, doi: 10.1109/ACCESS.2021.3071089.
18. K. N. Dang, A. B. Ahmed, A. B. Abdallah and X. -T. Tran, "TSV-OCT: A Scalable Online Multiple-TSV Defects Localization for Real-Time 3-D-IC Systems," IEEE Transactions on Very Large-Scale Integration (VLSI) Systems, vol. 28, no. 3, pp. 672-685, March 2020, doi: 10.1109/TVLSI.2019.2948878.
19. Z. Wang, M. Ogbodo, H. Huang, C. Qiu, M. Hisada and A. B. Abdallah, "AEBIS: AI-Enabled Blockchain-Based Electric Vehicle Integration System for Power Management in Smart Grid Platform," IEEE Access, vol. 8, pp. 226409-226421, 2020, doi: 10.1109/ACCESS.2020.3044612.
20. K. N. Dang, A. B. Ahmed, A. B. Abdallah and X. -T. Tran, "A Thermal-Aware On-Line Fault Tolerance Method for TSV Lifetime Reliability in 3D-NoC Systems," IEEE Access, vol. 8, pp. 166642-166657, 2020, doi: 10.1109/ACCESS.2020.3022904.
21. K. N. Dang, A. B. Ahmed, Y. Okuyama and A. B. Abdallah, "Scalable Design Methodology and Online Algorithm for TSV-Cluster Defects Recovery in Highly Reliable 3D-NoC Systems," IEEE Transactions on Emerging Topics in Computing, vol. 8, no. 3, pp. 577-590, 1 July-Sept. 2020, doi: 10.1109/TETC.2017.2762407.
22. K. N. Dang, M. C. Meyer, A. B. Ahmed, A. B. Abdallah and X. -T. Tran, "A Non-Blocking Non-Degrading Multiple Defects Link Testing Method for 3D-Networks-on-Chip," in IEEE Access, vol. 8, pp. 59571-59589, 2020, doi: 10.1109/ACCESS.2020.2982836.
23. The H. Vu, Yuichi Okuyama, Abderazek Ben Abdallah, "Comprehensive Analytic Performance Assessment and K-means based Multicast Routing Algorithms and Architecture for 3D-NoC of Spiking Neurons," ACM Journal on Emerging Technologies in Computing Systems (JETC), Special Issue on Hardware and Algorithms for Learning On-a-chip for Energy-Constrained On-Chip Machine Learning, Vol. 15, No. 4, Article 34, October 2019. doi: 10.1145/3340963.
24. T. H. Vu, O. M. Ikechukwu and A. Ben Abdallah, "Fault-Tolerant Spike Routing Algorithm and Architecture for Three Dimensional NoC-Based Neuromorphic Systems," IEEE Access, vol. 7, pp. 90436-90452, 2019, doi: 10.1109/ACCESS.2019.2925085.
25. The H. Vu, Yuichi Okuyama, Abderazek Ben Abdallah, ''Analytical performance assessment and high-throughput low-latency spike routing algorithm for spiking neural network systems,'' Journal of Supercomputing 75, pp. 5367–5397 (2019). https://doi.org/10.1007/s11227-019-02792-y.
26. Michael Meyer, Yuichi Okuyama, Abderazek Ben Abdallah," SAFT-PHENIC: a thermal-aware microring fault-resilient photonic NoC," The Journal of Supercomputing, Volume 74, Issue 9, pp 4672–4695, 2018. DOI: 10.1007/s11227-018-2463-x[26].
27. Khanh N. Dang, Akram Ben Ahmed, Xuan-Tu Tran, Yuichi Okuyama, Abderazek Ben Abdallah," A Comprehensive Reliability Assessment of Fault-Resilient Network-on-Chip Using Analytical Model", IEEE Transactions on Very Large-Scale Integration (VLSI) Systems, Vol. 25, Issue: 11, pp. 3099 – 3112, vol. 2017. DOI: 10.1109/TVLSI.2017.2736004[27].
28. A. B. Ahmed, T. Yoshinaga and A. Ben Abdallah, "Scalable Photonic Networks-on-Chip Architecture Based on a Novel Wavelength-Shifting Mechanism," in IEEE Transactions on Emerging Topics in Computing, vol. 8, no. 2, pp. 533-544, 1 April-June 2020, doi: 10.1109/TETC.2017.2737016.
29. Khanh N. Dang, Michael Meyer, Yuichi Okuyama, Abderazek Ben Abdallah," A Low-overhead Soft-Hard Fault Tolerant Architecture, Design and Management Scheme for Reliable High-performance Many-core 3D-NoC Systems," Journal of Supercomputing (2017) 73:2705–2729.
30. Achraf Ben Ahmed, A. Ben Abdallah, "Architecture and Design of Real-Time Systems for Elderly Health Monitoring," Journal of Embedded Systems, 2017, Vol.9, No.5, pp.484 – 494, DOI: 10.1504/IJES.2017.10007717.

31. Michael Meyer, Yuichi Okuyama, Abderazek Ben Abdallah, ”Microring Fault-resilient Photonic Network-on-Chip for Reliable High-performance Many-core Systems,” The Journal of Supercomputing, Volume 73, Issue 4, pp 1567–1599 , April 2017. doi: 10.1007/s11227-016-1846-0.
32. Achraf Ben Ahmed, Abderazek Ben Abdallah,"An Energy-Efficient High-Throughput Mesh-Based Photonic On-Chip Interconnect for Many-Core Systems," Photonics 2016, 3(2), 15; https://doi.org/10.3390/photonics3020015.
33. Akram Ben Ahmed, Abderazek Ben Abdallah,” Adaptive Fault-Tolerant Architecture and Routing Algorithm for Reliable Many-Core 3D-NoC Systems”, Journal of Parallel and Distributed Computing, Volumes 93–94, July 2016, Pages 30-43, ISSN 0743-7315, doi: 10.1016/j.jpdc.2016.03.014.
34. Achraf Ben Ahmed, Abderazek Ben Abdallah, “Hybrid Silicon-Photonic Network-on-Chip for Future Generations of High-performance Many-core Systems,” The Journal of Supercomputing, Dec. 2015, Vol. 71, Issue 12, pp 4446-4475. DOI: 10.1007/s11227-015-1539-0.
35. Akram Ben Ahmed, A. Ben Abdallah,”Graceful Deadlock-Free Fault-Tolerant Routing Algorithm for 3D Network-on-Chip Architectures,” Journal of Parallel and Distributed Computing, 74/4 (2014), pp. 2229-2240
36. Akram Ben Ahmed, A. Ben Abdallah,” Architecture and Design of High-throughput, Low-latency and Fault-Tolerant Routing Algorithm for 3D-Network-on-Chip,” The Journal of Supercomputing, December 2013, Volume 66, Issue 3, pp 1507-1532.
37. Abderazek Ben Abdallah, M. Masuda, A. Canedo, K. Kuroda, “Natural Instruction Level Parallelism-aware Compiler for High-Performance QueueCore Processor Architecture,” The Journal of Supercomputing, Volume 57, Number 3, pp. 314-338, Sept. 2011.
38. Arquimedes Canedo, Abderazek Ben Abdallah, Masahiro Sowa, “Compiling for Reduced Bit-Width Queue Processors,” Journal of Signal Processing Systems, Volume 59, Number 1, 45-55, 2010.
39. Arquimedes Canedo, Abderazek Ben Abdallah, Masahiro Sowa, “Efficient Compilation for Queue Size-Constrained Queue Processors”, Journal of Parallel Computing, Vol.35, pp. 213-225, 2009.
40. Arquimedes Canedo, Abderazek Ben Abdallah, Masahiro Sowa, “Design and Implementation of a Queue Compiler”, Journal of Microprocessors and Microsystems, Vol. 33, Issue 2, pp. pp. 29-138, 2009.
41. Arquimedes Canedo, Abderazek Ben Abdallah, Masahiro Sowa, “Compiler Support for Code Size Reduction using a Queue-based Processor”, Transactions on High-Performance Embedded Architectures and Compilers, Vol. 2, Issue 4, pp. 269-285, 2009.
42. Abderazek Ben Abdallah, A. Canedo, T. Yoshinaga, M. Sowa, “The QC-2 Parallel Queue Processor Architecture,” Journal of Parallel and Distributed Computing, Vol. 68, No. 2, pp. 235-245, 2008.
43. Md. Musfiquzzaman Akanda, Abderazek Ben Abdallah, and Masahiro Sowa, “Dual-Execution Mode Processor Architecture,” The Journal of Supercomputing, Vol. 44, No. 2, pp. 103-125, 2008
44. A. Acanda, Ben Abdallah, and M. Sowa, “A New Code Generation Algorithm for 2-offset Producer Order Queue Computation Model,” Journal of Computer Languages, Systems and Structures, Vol. 34, Issue 4, pp. 184-194, 2007
45. A. Ben Abdallah, and M. Sowa, “Advanced Power Management Techniques for Mobile Communication Systems,” Journal of Computer Research, Vol. 14, No.2, pp. 109-128, 2007
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Authored over 80 peer-reviewed conference papers, predominantly in top-tier IEEE conferences; complete publication list available at: https://www.u-aizu.ac.jp/~benab/publications-e.html

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2. Kaisei Kaneko, Zhishang Wang, Khanh N. Dang and Abderazek Ben Abdallah, "Research on Energy Trading System in Vehicle-to-Grid Networks", ETLTC2025, January 2025, Aizu-Wakamatsu

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Non-Refereed Conference Publications

1. Ryunosuke Murakami, Yuichi Okuyama, Abderazek Ben Abdallah," Animal Recognition and Identification with Deep Convolutional Neural Networks for Farm Monitoring", Information Processing Society Tohoku Branch Conference, Koriyama, Japan, Feb. 10, 2018
2. Yuji Murakami, Yuichi Okuyama, Abderazek Ben Abdallah," SRAM-Based Neural Network System for Traffic-Light Recognition in Autonomous Vehicles", Information Processing Society Tohoku Branch Conference, Koriyama, Japan, Feb. 10, 2018
3. Kanta Suzuki, Yuichi Okuyama, Abderazek Ben Abdallah," Hardware Design of a Leaky Integrate and Fire Neuron Core Towards the Design of a Low-power Neuro-inspired Spike-based Multicore SoC", Information Processing Society Tohoku Branch Conference, Koriyama, Japan, Feb. 10, 2018
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Biography

Abderazek Ben Abdallah is Regent, Dean, and Full Professor in the School of Computer Science and Engineering at the University of Aizu, Japan. He has served on the university's Education and Research Council since 2014 and previously led its Computer Engineering Division from 2014 to 2022. He received his Ph.D. in Computer Engineering from the University of Electro-Communications (UEC), Tokyo, in 2002.

With more than two decades of academic leadership, Dr. Ben Abdallah's research focuses on high-performance and energy-efficient computing systems, spanning computer architecture, neuromorphic circuits and systems, fault-tolerant on-chip networks, and embedded systems. He is the author of four books, including *Neuromorphic Computing: Principles and Organization*—recognized by BookAuthority in June 2025 as the best neuromorphic computing book of all time—and *Multicore Systems-on-Chip: Practical Software/Hardware Design*, which has been translated into Chinese. His scholarly record includes over 160 peer-reviewed publications, 17 competitive research grants, and 14 patents (9 registered, 5 provisional). His recent innovations include leading the development of the world's first AI-powered off-grid solar carport for renewable energy storage (2022–2023) and directing a full-cycle parallel processor design project (2002–2007) covering ISA design, hardware prototyping, and cycle-accurate simulation.

A dedicated educator, Dr. Ben Abdallah has taught a broad range of undergraduate and graduate courses, including Computer Architecture, Logic Circuit Design, Computer Systems, and Neuromorphic Computing. He has supervised four postdoctoral fellows, eleven Ph.D. candidates, twenty-four master's students, and more than forty bachelor's theses, and has served as an external Ph.D. examiner for institutions such as the University of Otago (New Zealand) and the University of Aizu (Japan). In total, he has mentored over seventy-five graduate students and postdoctoral researchers worldwide.

He is the founder and standing chair of the IEEE MCSoC Forum (International Symposium on Embedded Multicore/Manycore Systems-on-Chip), providing strategic leadership since its inception and serving as General Chair in 2017 and 2021. He currently serves as **Associate Editor-in-Chief of IEEE Computer Magazine**, and as Associate Editor for *IEEE Network Magazine* and *Frontiers in Neuroscience: Neuromorphic Engineering*. He has previously served on the editorial boards of *IEEE Transactions on Emerging Topics in Computing* and the *Journal of Embedded Systems*, and in 2025 was appointed Topic Editor for Computational Neuromorphic Imaging within *Frontiers in Neuroscience*. He has been a member of the IEEE CASS Technical Committee on Circuits and Systems Education and Outreach (CASEO) since 2025, and regularly reviews for leading journals and major funding agencies, including the Research Grants Council of Hong Kong and the Austrian Science Fund. His service record also includes participation in high-level academic and governmental committees, such as the Distinguished University Professor Committee at Hamad Bin Khalifa University (2024) and the Tunisian Prime Minister's High-Level Committee for Science and Technology (2009–2011).

Dr. Ben Abdallah has delivered invited lectures at institutions including the Tokyo University of Foreign Studies (2024–2025), the Kyoto Institute of Technology (2022–present), and the Hong Kong University of Science and Technology (2010–2013). His international academic engagements also include visiting professorships at Huazhong University of Science and Technology (2011–2015), the African University of Science and Technology in Abuja (2008–2015), and the Hong Kong University of Science and Technology (2010–2013). He has presented more than twenty-three keynote addresses and invited talks worldwide, with recent appearances at the Kyoto Institute of Technology, the University of Electro-Communications, and the Tokyo University of Foreign Studies.

His honors include the 2010 National President Award for Best Tunisian Researcher Abroad, Outstanding Achievement Awards from HUST (1993, 1994), and multiple Best Paper and Best Presentation Awards at international conferences. He is a Senior Member of both IEEE and ACM and was elected a Full Member of Sigma Xi, The Scientific Research Honor Society, in July 2025.

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