



Muhammad Babar Rasheed

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Summary of CV

This section describes briefly a summary of your career in science, academic and research; the main scientific and technological achievements and goals in your line of research in the medium -and long- term. It also includes other important aspects or peculiarities.

I am a distinguished academic, researcher, and educator with specialized expertise in electronics engineering, optimization algorithms, and intelligent energy systems. Currently, I serve as a Lecturer (Assistant Professor) in Engineering and Technology at the University of Gloucestershire, UK. My academic background includes a PhD, MS, and BS in Electrical and Computer Engineering, with doctoral research undertaken at Dartmouth College, USA. I also hold advanced degrees in Electrical Engineering and Electronics. As a Fellow of the Higher Education Academy and Senior Member of IEEE, I have consistently demonstrated excellence in both research and pedagogy. This is further supported by my selection for the UK Global Talent Visa and the prestigious Marie Curie COFUND Fellowship. Over the course of my academic career, I have produced a substantial body of research, comprising 44 peer-reviewed journal articles and 20 international conference proceedings. My research interests include AI-enabled optimization algorithms, multi-agent systems for smart grids, energy-water-hydrogen nexus modeling, and blockchain-enabled energy trading.

I have successfully led and contributed to interdisciplinary research initiatives with funding exceeding £1.2 million, secured from prominent agencies such as the Leverhulme Trust, Spanish MICINN, Horizon 2020 MSCA, and the Higher Education Commission (HEC) of Pakistan. These projects have addressed global challenges in sustainable energy, distributed systems, and integrated resource planning. In the academic domain, I teach a wide range of undergraduate and postgraduate modules, including Real-Time Embedded Systems, Machine Learning, Electronics, and Optimization Algorithms. My teaching philosophy integrates hands-on learning, industry-relevant problem solving, and outcome-based assessment. I have held academic leadership roles such as Acting Head of Department and actively contributed to curriculum modernization through my involvement in the university's curriculum review committee. This includes aligning course and module learning outcomes with current industry standards and future skills. In addition to my academic and research duties, I have established five research groups in emerging areas such as smart grid automation, energy analytics, and intelligent control systems. I mentor students at all levels from undergraduate final-year projects to doctoral research supervision supporting both academic development and research publication. I also serve as Associate Editor for Wiley's Fellow in Engineering journal, contributing to peer review and editorial decision-making. My interdisciplinary background, international research collaborations, and commitment to teaching excellence team me to contribute meaningfully to the advancement of engineering and technology education and research at a global level.



General quality indicators of scientific research

This section describes briefly the main quality indicators of scientific production (periods of research activity, experience in supervising doctoral theses, total citations, articles in journals of the first quartile, H index...). It also includes other important aspects or peculiarities.

With over 62 peer-reviewed publications and more than 2200 citations, my scientific production reflects sustained quality, relevance, and impact across multiple domains of electrical and computer engineering. I have published extensively in high-impact journals including IEEE, Elsevier, Wiley, MDPI, and Frontiers, with 53% of my work appearing in Q1-ranked outlets, underscoring the rigor and visibility of my research. My citation metrics—h-index of 26 and i10-index of 45 demonstrate consistent scholarly influence. I have secured prestigious funding from Horizon Europe, Marie Skłodowska-Curie Actions, Leverhulme Trust, and national innovation programs, serving as Principal Investigator or Co-PI on multi-institutional projects exceeding several million USD. My leadership extends to editorial roles with Wiley and Frontiers, and guest editorships in thematic research collections. I maintain active international collaborations with Durham, Lancaster, Glasgow, Alcalá, Texas A&M, Southern Methodist, and King Abdulaziz universities, facilitating cross-border knowledge exchange. I have mentored over 50 graduate and doctoral researchers, many of whom have contributed to high-impact publications and industry-relevant innovations. These indicators collectively affirm the excellence, interdisciplinarity, and translational value of my scientific contributions.



Muhammad Babar Rasheed

Surname(s): **Rasheed**
Name: **Muhammad Babar**
Passport: **CW9840923**
ORCID: **0000-0002-9911-0693**
Date of birth: **04/12/1985**
Gender: **Male**
Nationality: **Pakistan**
Country of birth: **Pakistan**
Contact province: **Madrid**
City of birth: **Toba Tek Singh**
Contact address: **Calle El Greco**
Postcode: **28803**
Contact country: **Spain**
Contact aut. region/reg.: **Community of Madrid**
Contact city: **Alcala de Henares**
Email: **muhammad.rasheed@uah.es**
Mobile phone: **(+34) 637559770**
Personal web page: **<https://scholar.google.es/citations?user=Rjj2sDMAAAAJ&hl=es>**

Current professional situation

Employing entity: University of Gloucestershire, **Type of entity:** University
UK

Department: Engineering and Technology

Professional category: Lecturer (Asst. Prof.) in Engineering (Teaching & Research)

Start date: 13/05/2023

Type of contract: Temporary employment contract **Dedication regime:** Full time

Primary (UNESCO code): 330600 - Electrical technology and engineering; 339900 - Other Technological specialties

Secondary (UNESCO code): 330602 - Electricity applications; 330604 - Electric lighting; 330609 - Transmission and distribution

Tertiary (UNESCO code): 330606 - Manufacture of electrical equipment; 330699 - Other

Performed tasks: As an Academic Professional and Researcher at the University of Gloucestershire, UK, I blend teaching, research, and student supervision across Levels 3 to 7, specialising in machine learning, electronics, and automation. I design and deliver engaging curriculum, update course and module learning outcomes (CLOs), assess student progress, and foster critical thinking and hands-on expertise. Over the past three years, I have produced rigorous research in artificial intelligence and machine learning applied to energy systems, engineering, transportation, and the energy-water nexus, publishing in multiple peer-reviewed journal articles. I have successfully secured competitive funding, including Quality Research (QR) support from the University of Gloucestershire (£10K), a 10 million PKR grant from the Higher Education Commission of Pakistan, and submitted two promising project proposals to the Abu Dhabi Young Researchers Award. I also serve as Associate Editor and Fellow in Engineering at Wiley, contributing to the scholarly review process. I recently obtained a certificate for the Higher Education Academy (FHEA) Fellowship. In mentoring roles, I supervise undergraduate, master's, and doctoral students, guiding research design, thesis work, and career development. My

integrated approach combines strong pedagogy, impactful research, and committed mentorship, which contributes to the advancement of engineering education and innovation.

Identify key words: Electric engineers, electronic and automatic (eil)

Previous positions and activities

	Employing entity	Professional category	Start date
1	Universidad de Alcalá, Spain	Marie Curie COFUND Fellow	25/01/2021
2	Durham University, United Kingdom	Visiting Researcher	01/01/2023
3	University of Lahore, Pakistan	Associate Professor of Engineering (Research)	19/10/2020
4	University of Lahore, Pakistan	Assistant Professor of Engineering (Research)	22/08/2017
5	COMSATS University Islamabad, Pakistan	Research Associate	01/02/2012
6	Dartmouth College, NH, United States of America	Visiting Doctoral Researcher	29/09/2016
7	COMSATS University Islamabad, Wah Campus	Visiting Lecturer	01/02/2014
8	International Islamic University Islamabad, Pakistan	Visiting Lecturer	01/02/2013
9	SABRO Technologies Pvt. Ltd. I-9 Islamabad, Pakistan	Sales Engineer	01/01/2011

- Employing entity:** Universidad de Alcalá, Spain
Professional category: Marie Curie COFUND Fellow
Start-End date: 25/01/2021 - 13/05/2023 **Duration:** 2 years - 3 months - 18 days
- Employing entity:** Durham University, United Kingdom
Professional category: Visiting Researcher
Start-End date: 01/01/2023 - 30/03/2023 **Duration:** 3 months
- Employing entity:** University of Lahore, Pakistan
Professional category: Associate Professor of Engineering (Research)
Start-End date: 19/10/2020 - 18/01/2021 **Duration:** 3 months
- Employing entity:** University of Lahore, Pakistan
Professional category: Assistant Professor of Engineering (Research)
Start-End date: 22/08/2017 - 18/10/2020 **Duration:** 3 years - 1 month - 26 days
- Employing entity:** COMSATS University Islamabad, Pakistan
Professional category: Research Associate
Start-End date: 01/02/2012 - 13/08/2017 **Duration:** 5 years - 6 months - 12 days

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Employing entity: Dartmouth College, NH, United States of America

Professional category: Visiting Doctoral Researcher

Start-End date: 29/09/2016 - 03/03/2017

Duration: 6 months - 3 days

7 Employing entity: COMSATS University Islamabad, Wah Campus

Professional category: Visiting Lecturer

Start-End date: 01/02/2014 - 30/06/2014

Duration: 4 months - 29 days

8 Employing entity: International Islamic University Islamabad, Pakistan

Professional category: Visiting Lecturer

Start-End date: 01/02/2013 - 30/06/2013

Duration: 4 months - 29 days

9 Employing entity: SABRO Technologies Pvt. Ltd. I-9 Islamabad, Pakistan

Professional category: Sales Engineer

Start-End date: 01/01/2011 - 30/06/2011

Duration: 5 months - 29 days

Summary of professional activity

Dr. Muhammad Rasheed is a distinguished academic with over 5+ years of experience in sustainable energy systems, currently serving as Lecturer in Engineering at the University of Gloucestershire with a Global Talent Visa for the UK. His career encompasses significant leadership roles, including Acting Head of Department for in Engineering at The University of Lahore, where he was recognized as Eminent Researcher of the Year in 2020-23, alongside extensive teaching in Machine Learning, Engineering and Optimization. With 42 journal articles and 20 conference proceedings in high-impact venues including Applied Energy (IF-10.1), Energy (IF-9.0), and Journal of Cleaner Production (IF-9.297), his research focuses on the energy-water-hydrogen nexus, electric vehicle optimization, and blockchain-enabled energy trading. His international recognition includes prestigious fellowships such as the Marie Skłodowska-Curie Individual Fellowship at the University of Alcalá, Spain, and Doctoral Research Fellowship at Dartmouth College, USA, while securing over £2M in funding from sources including the Leverhulme Trust, Spanish MICINN and QR-fund UK. Dr. Rasheed serves as Associate Editor for multiple journals including (IEEE, Elsevier, Springer, Wiley), and has supervised 50+ students across all levels, maintaining global collaborations with institutions in the UK, USA, and Spain, complemented by his memberships as Senior Member IEEE (SMIEEE) and Fellow of the Higher Education Academy (FHEA).



Education

University education

1st and 2nd cycle studies and pre-Bologna degrees

1 University degree: Higher degree

Name of qualification: Master's Degree in Electrical Engineering

Degree awarding entity: COMSATS University Islamabad (CUI) Pakistan **Type of entity:** University

Date of qualification: 13/03/2013

2 University degree: Higher degree

Name of qualification: Bachelor in Electronics

Degree awarding entity: SINDH University, Pakistan **Type of entity:** University

Date of qualification: 14/04/2010

Doctorates

Doctorate programme: PhD in Computer Engineering

Degree awarding entity: COMSATS University Islamabad (CUI) Pakistan **Type of entity:** University

Date of degree: 30/12/2017

Other postgraduate university studies

Postgraduate qualification: Fellowship of Higher Education Academy (FHEA)

Degree awarding entity: UK's Higher Education Academy (HEA)

Date of qualification: 16/05/2024

Specialised, lifelong, technical, professional and refresher training (other than formal academic and healthcare studies)

Training title: Equity Diversity and Inclusion

Awarding entity: University of Gloucestershire, UK

End date: 01/11/2024

Duration in hours: 40 hours

Attended advanced, improvement and innovative teacher training and new technology courses and seminars focused on improving teaching

1 Title of course/seminar: Generative AI in Higher Education

Goals of the course/seminar: I attended a seminar on Generative AI in Higher Education to explore the transformative potential of AI-driven technologies in reshaping teaching, learning, and assessment practices across academic institutions. Its main objectives included understanding the capabilities of generative AI tools such as large language models (LLMs) and content generators and evaluating ethical, pedagogical, and practical implications. Participants examined how GenAI can support personalized learning, automate feedback, enhance curriculum design, and foster inclusive education. The seminar also emphasized the importance of academic integrity, critical AI literacy, and responsible use of AI in student assessment. Through interactive sessions and case studies, attendees gained insights into innovative assessment frameworks, such as AI-assisted formative evaluations and authentic learning tasks. Key outcomes included increased awareness of the challenges posed by cognitive offloading and over-reliance on tools, as well as strategies to mitigate these risks through reflective practice and institutional policy. The seminar encouraged educators to adopt a balanced approach leveraging GenAI to enrich learning experiences while maintaining human-centered pedagogy. Ultimately, it empowered participants to lead ethical and effective integration of generative AI in higher education, preparing students for a future shaped by intelligent technologies.

Organising entity: University of Gloucestershire, England

Type of entity: University

Faculty, institute or centre: Engineering and Technology

Duration in hours: 1 hour

Start-End date: 23/01/2025 - 23/01/2025

2 Title of course/seminar: Fellowship of the Higher Education Academy (FHEA)

Goals of the course/seminar: The Fellowship of the Higher Education Academy (FHEA), awarded through Advance HE and supported by the Institution of Engineering and Technology (IET), recognizes individuals who demonstrate a sustained commitment to excellence in teaching and learning in higher education. The course is grounded in the UK Professional Standards Framework (UKPSF), which outlines core knowledge, professional values, and areas of activity essential for effective academic practice. Its objectives include fostering inclusive and evidence-based teaching strategies, enhancing student engagement, and promoting reflective practice among educators. Participants are expected to critically evaluate their pedagogical approaches, demonstrate impact on student learning, and contribute to the academic community through leadership and innovation. The Fellowship also encourages collaboration across disciplines and supports continuous professional development. By aligning with the IET, the program emphasizes the integration of engineering education with pedagogical excellence, preparing fellows to lead transformative learning experiences in STEM fields.

Organising entity: Advance HE, United Kingdom

Type of entity: State agency

Faculty, institute or centre: Higher Education in England

Duration in hours: 1200 hours

Start-End date: 15/02/2024 - 15/05/2024

3 Title of course/seminar: Faculty Teaching Training

Goals of the course/seminar: I completed a seven-day full-time classroom-based teaching training program at the University of Lahore, Pakistan (2019), designed to enhance pedagogical competencies in higher education. The program covered curriculum design, outcome-based education (OBE), active learning strategies, and student engagement techniques. It included hands-on workshops on lesson planning, formative and summative assessments, and the use of Bloom's Taxonomy for designing learning outcomes. Interactive sessions introduced educational technologies such as Moodle, Kahoot, and Google Classroom to promote blended and flipped learning models. Microteaching sessions allowed peer feedback and reflection, while case studies and role-plays simulated real classroom challenges, fostering inclusive and adaptive teaching practices. The training emphasized reflective teaching journals, peer observation, and continuous professional development. By integrating modern instructional tools with student-centered approaches, the program significantly strengthened my ability to design effective learning experiences and assess student performance against measurable outcomes.

Organising entity: University of Lahore, Pakistan

Type of entity: University



Faculty, institute or centre: Engineering and Technology

Duration in hours: 40 hours

Start-End date: 27/05/2018 - 31/05/2018

4 Title of course/seminar: Demand Response Technologies in Smart Energy Systems

Goals of the course/seminar: The 3-day program on Demand Response Technologies in Smart Energy Systems provided a comprehensive exploration of strategies to enhance grid flexibility, efficiency, and sustainability. Rooted in the evolving landscape of smart grids, the course focused on the integration of advanced metering infrastructure, real-time data analytics, and automated control systems to optimize electricity consumption. Key objectives included understanding the mechanisms of demand response (DR), differentiating between price-based and incentive-based models, and evaluating their role in balancing supply-demand dynamics. Participants engaged with case studies and simulations to assess how DR can reduce peak loads, support renewable energy integration, and defer costly infrastructure upgrades. The program emphasized consumer engagement, regulatory frameworks, and the technological enablers—such as smart thermostats, home energy management systems, and EV smart chargers—that facilitate responsive energy behavior. Outcomes included enhanced knowledge of DR program design, implementation challenges, and the potential of DR to contribute to decarbonization and grid resilience. The training equipped participants with the tools to lead innovation in energy systems and contribute to the transition toward smarter, more sustainable power networks.

Organising entity: COMSATS University Islamabad
Pakistan

Type of entity: University

Faculty, institute or centre: Engineering

Duration in hours: 24 hours

Start-End date: 07/04/2014 - 09/04/2014

Language skills

Language	Listening skills	Reading skills	Spoken interaction	Speaking skills	Writing skills
Spanish	A1	A1	A1	A1	A1
English	C2	C2	C2	C1	C2

Teaching experience

Experience supervising doctoral thesis and/or final year projects

1 Project title: Hyperparameter Optimisation of Deep Learning Algorithms

Entity: University of Gloucestershire

Type of entity: University

Student: Mahi Nooh Arshad

Date of reading: 29/09/2026

2 Project title: A Secure Peer to Peer Energy Trading Model through Blockchain using Demurrage Scheme

Entity: University of Engineering and Technology
Lahore, Pakistan

Type of entity: University

Student: Zain Chishti

Date of reading: 11/12/2025

3 Project title: SELF-ADAPTIVE ENERGY MANAGEMENT IN SMART GRID ENVIRONMENT

Entity: University of Engineering and Technology
Lahore, Pakistan

Type of entity: University

Student: Muhammad Zulfiqar



Date of reading: 13/09/2023

Student tutorials

Name of the programme: Educational aid

Entity: University of Gloucestershire

Type of entity: University

Frequency of the activity: 24

Regulated Mentoring: Yes

Description Narrative: As a personal tutor to 41 students, I conduct two structured meetings each month to provide academic, and professional support to fulfil individual needs. These sessions typically begin with a reflective review of academic progress, where we discuss module performance, feedback interpretation, and strategies for improvement. I generally guided the students in setting realistic goals and identifying resources to enhance their learning, such as workshops, study groups, or digital tools. We also explored career aspirations, offering advice on internships, research opportunities, and CV development. For final-year students, I support dissertation planning and postgraduate pathways. Beyond academics, I address personal wellbeing, encouraging open dialogue around stress, time management, and work-life balance, and signposting university support services when needed. These meetings foster a sense of belonging and trust, allowing students to share challenges and celebrate achievements. I maintain a record of each interaction to track development and ensure continuity. Between meetings, I remain accessible via email and office (LC127) and informal drop-ins, reinforcing a supportive learning environment. This holistic approach helps students navigate the complexities of university life, build confidence, and develop the skills necessary for academic success and professional growth.

Courses and seminars given

1 Type of event: Course

Name of the event: Machine Learning Teaching at Graduate Level

Organising entity: University of Gloucestershire in England

Type of entity: University

Hours of teaching: 36

Teaching date: 21/04/2025

Theme: Other topics

2 Type of event: Training Session

Name of the event: Professional Scientific Writing with Latex and Overleaf

Organising entity: The University of Lahore, Pakistan

Type of entity: University

Hours of teaching: 8

Teaching date: 02/05/2018

Other teaching merits

In addition to core teaching responsibilities, I have consistently demonstrated a commitment to pedagogical innovation, curriculum enhancement, and student development across multiple institutions. My teaching merits include the integration of cutting-edge technologies such as Raspberry Pi, Portenta H7, and MATLAB-GAMS co-simulations into laboratory and project-based learning environments, enabling students to engage with real-world engineering challenges. I have designed and delivered interdisciplinary modules that bridge electrical engineering with AI, sustainability, and industrial automation, ensuring relevance to contemporary industry demands. My role as a personal tutor to 41 students involves structured academic and pastoral support, fostering reflective learning and career planning. I have supervised over 50 undergraduate and postgraduate research projects, many of which led to peer-reviewed publications and practical implementations. My mentorship philosophy,



aligned with FHEA principles, nurtures independent inquiry and critical thinking. I actively contribute to curriculum development, assessment design, and accreditation processes, including leading module reviews under tight deadlines. My teaching excellence is further evidenced by international training facilitation, such as co-leading the Latin American Deep Learning Summer School, and by consistently high student feedback scores. These merits reflect a student-centered approach blended with academic rigor.

Plurality, interdisciplinarity and teaching complexity

I have experience in teaching electronics and electrical engineering across diverse academic and cultural contexts, with a particular focus on machine learning, analog and digital electronics, power systems, smart grids, and industrial automation. This engagement has exposed me to the plurality of learner profiles, disciplinary expectations, and institutional pedagogies. Teaching complexity in such environments emerges from the need to navigate layered conceptual domains ranging from abstract mathematical modeling to hands-on system integration while fostering interdisciplinary fluency. My modules often intersect with computer science, energy policy, and embedded systems, requiring students to synthesize knowledge across technical and socio-economic dimensions. This necessitates a pedagogical approach that balances depth with accessibility, using simulations, project-based learning, and reflective inquiry to scaffold understanding. The complexity is further amplified by the rapid evolution of technologies and the imperative to embed ethical, sustainable, and inclusive perspectives. I design assessments that evaluate not only technical competence but also systems thinking and collaborative problem-solving. Ultimately, teaching complexity is not a barrier but a catalyst; it transforms the classroom into a dynamic space where learners are equipped to address real-world challenges through interdisciplinary insight and adaptive expertise.

Scientific and technological experience

Research and development groups/teams

- 1** **Name of the group:** Intelligent System Group
Aims of the group: Research and Development
Type of collaboration: Co-authorship of projects and their development
Affiliation entity: Universidad de Alcalá **Type of entity:** University
Start date: 25/01/2021 **Duration:** 2 years - 3 months
- 2** **Name of the group:** Laboratory for Intelligent Integrated Networks of Engineering Systems (LIINES)
Type of collaboration: Co-authorship of publications
Affiliation entity: Dartmouth College, USA
Start date: 27/09/2017 **Duration:** 5 months - 3 days
- 3** **Name of the group:** Communication over Sensors (ComSens)
Aims of the group: Collaboration in Research and Development
Type of collaboration: Co-authorship of international collaboration
Affiliation entity: National Yunlin University of Science and Technology
Start date: 02/02/2012 **Duration:** 13 years - 11 months - 25 days

Scientific or technological activities

R&D projects funded through competitive calls of public or private entities

- 1** **Name of the project:** Quality Research (QR) Fund
Entity where project took place: University of Gloucestershire in England
City of entity: Cheltenham, Gloucestershire, Wiltshire and North Somerset, United Kingdom
Name principal investigator (PI, Co-PI....): Muhammad Babar Rasheed; Mah Rukh Fida
Nº of researchers: 2
Start-End date: 01/08/2025 - 30/12/2026
Total amount: 11.550 €
- 2** **Name of the project:** Ignite Challenge-driven Innovation Fund
Entity where project took place: Higher Education Commission of Pakistan
City of entity: Multan, Pakistan
Name principal investigator (PI, Co-PI....): Muhammad Zulfiqar; Muhammad Babar Rasheed
Nº of researchers: 2
Start-End date: 09/09/2025 - 08/09/2026
Total amount: 30.000 €
- 3** **Name of the project:** Institutional Fund Projects under grant number (IFPIP: 1555-135-1442)
Entity where project took place: Ministry of Education and King Abdulaziz University, DSR
City of entity: Jeddah, Saudi Arabia
Name principal investigator (PI, Co-PI....): Thamer Alquthami; Muhammad Babar Rasheed
Nº of researchers: 2
Start-End date: 15/05/2022 - 15/05/2023
Total amount: 22.000 €
- 4** **Name of the project:** Reinforcement Learning-Enabled Electric Vehicle Load Forecasting for Grid Energy Management
Entity where project took place: Deputyship for Research and Innovation, Ministry of Education in Saudi Arabia ()
Type of entity: State agency
Name principal investigator (PI, Co-PI....): Thamer Alquthami; Muhammad Babar Rasheed
Start-End date: 28/02/2022 - 31/03/2023
- 5** **Name of the project:** Reinforcement Learning-Enabled Electric Vehicle Load Forecasting for Grid Energy Management
Entity where project took place: Deputyship for Research and Innovation, Ministry of Education
City of entity: Saudi Arabia
Name principal investigator (PI, Co-PI....): Nahar F Alshammari; Muhammad Babar Rasheed
Nº of researchers: 2
Start-End date: 10/02/2022 - 31/03/2023
Total amount: 5.000 €

- 6** **Name of the project:** A hybrid framework for short term load forecasting with a novel feature engineering and adaptive grasshopper optimization in smart grid
Entity where project took place: Institutional Fund Projects, Ministry of Education and King Abdulaziz University, DSR, Jeddah, Saudi Arabia. **Type of entity:** State agency
Name principal investigator (PI, Co-PI....): Thamer Alquthami; Muhammad Babar Rasheed
Start-End date: 07/02/2022 - 07/02/2023
Total amount: 23.000 €
- 7** **Name of the project:** Hyperparameter optimization of support vector machine using adaptive differential evolution for electricity load forecasting
Entity where project took place: Deanship of Scientific Research (DSR) at King Abdulaziz University, Jeddah, Saudi Arabia (RG-34-135-42) **Type of entity:** University
Name principal investigator (PI, Co-PI....): Thamer Alquthami; Muhammad Babar Rasheed
Start-End date: 01/09/2021 - 18/10/2022
Total amount: 23.000 €
- 8** **Name of the project:** A short-term load forecasting model based on self-adaptive momentum factor and wavelet neural network in smart grid
Entity where project took place: Deanship of Scientific Research (DSR) at King Abdulaziz University, Jeddah, Saudi Arabia (RG-34-135-42).
Name principal investigator (PI, Co-PI....): Thamer Alquthami; Muhammad Babar Rasheed
Start-End date: 01/06/2021 - 19/07/2022
Total amount: 23.000 €
- 9** **Name of the project:** A performance comparison of machine learning algorithms for load forecasting in smart grid
Entity where project took place: Deanship of Scientific Research (DSR) at King Abdulaziz University, Jeddah, Saudi Arabia: RG-34-135-42
Name principal investigator (PI, Co-PI....): Thamer Alquthami; Muhammad Babar Rasheed
Start-End date: 01/03/2021 - 09/04/2022
Total amount: 23.000 €
- 10** **Name of the project:** A comparison of wireless standards in IoT for indoor localization using LoPy
Entity where project took place: National Natural Science Foundation of China (NSFC) under project 51950410583. **Type of entity:** State agency
Name principal investigator (PI, Co-PI....): Muhammad Babar Rasheed
Start-End date: 01/07/2020 - 28/08/2021
- 11** **Name of the project:** (DA-DOPF): A Day-Ahead Dynamic Optimal Power Flow With Renewable Energy Integration in Smart Grids
Entity where project took place: King Abdulaziz University, Jeddah: RG-13-135-41
Name principal investigator (PI, Co-PI....): Thamer Alquthami; Muhammad Babar Rasheed
Start-End date: 01/07/2020 - 23/08/2021
Total amount: 23.000 €
- 12** **Name of the project:** Latin American Deep Learning Summer School
Entity where project took place: Universidad de Alcalá **Type of entity:** University
City of entity: Alcala de Henares, Community of Madrid, Spain



Name principal investigator (PI, Co-PI....): David Fernández Barrero; Muhammad Babar Rasheed
Nº of researchers: 2
Start-End date: 03/06/2021 - 10/06/2021
Total amount: 128.400 €

13 Name of the project: An incentive based dynamic pricing in smart grid: A customer's perspective
Entity where project took place: Deanship of Scientific Research (DSR) at King Abdulaziz University, Jeddah: (RG-13-135-41). **Type of entity:** University
Name principal investigator (PI, Co-PI....): Thamer Alquthami; Muhammad Babar Rasheed
Start-End date: 01/04/2020 - 27/05/2021
Total amount: 23.000 €

14 Name of the project: A Joint Optimization Model for Energy and Reserve Capacity Scheduling With the Integration of Variable Energy Resources
Entity where project took place: Deanship of Scientific Research (DSR) at King Abdulaziz University, Jeddah: RG-13-135-41 **Type of entity:** University
Name principal investigator (PI, Co-PI....): Thamer Alquthami; Muhammad Babar Rasheed
Start-End date: 01/04/2020 - 19/05/2021
Total amount: 23.000 €

15 Name of the project: A vehicle to vehicle relay-based task offloading scheme in vehicular communication networks
Entity where project took place: Marie Skłodowska-Curie grant agreement No 754382 **Type of entity:** State agency
Name principal investigator (PI, Co-PI....): Yazeed Gadhi; Muhammad Babar Rasheed
Start-End date: 01/03/2020 - 13/04/2021
Total amount: 23.000 €

16 Name of the project: Mining software architecture knowledge: Classifying stack overflow posts using machine learning
Entity where project took place: Deanship of Scientific Research (DSR) at King Abdulaziz University
Name principal investigator (PI, Co-PI....): Thamer Alquthami; Muhammad Babar Rasheed
Start-End date: 01/01/2020 - 31/03/2021
Total amount: 23.000 €

17 Name of the project: Measurements and channel modeling of low and medium voltage NB-PLC networks for smart metering
Entity where project took place: National Natural Science Foundation of China (NSFC) project (51950410583) **Type of entity:** State agency
Name principal investigator (PI, Co-PI....): Bilal Masood; Muhammad Babar Rasheed
Start-End date: 01/08/2019 - 28/09/2020

18 Name of the project: Multi-objective optimal power flow with integration of renewable energy sources using fuzzy membership function
Entity where project took place: Deanship of Scientific Research (DSR), King Abdulaziz University, Jeddah, under Grant D1441-407-135 **Type of entity:** University
Start-End date: 01/07/2019 - 03/08/2020
Total amount: 23.000 €

- 19 Name of the project:** A novel load scheduling mechanism using artificial neural network based customer profiles in smart grid
Start-End date: 01/01/2019 - 29/02/2020
Total amount: 23.000 €
- 20 Name of the project:** An optimal scheduling and distributed pricing mechanism for multi-region electric vehicle charging in smart grid
Entity where project took place: Deanship of Scientific Research (DSR), King Abdulaziz University, Jeddah: D-130-135-1441. **Type of entity:** University
Name principal investigator (PI, Co-PI....): Muhammad Babar Rasheed
Start-End date: 01/01/2019 - 27/02/2020
Total amount: 23.000 €
- 21 Name of the project:** Dynamic pricing mechanism with the integration of renewable energy source in smart grid
Entity where project took place: Deanship of Scientific Research (DSR), King Abdulaziz University, Jeddah: DF-307-135-1441. **Type of entity:** University
Name principal investigator (PI, Co-PI....): Thamer Alquthami; Muhammad Babar Rasheed
Start-End date: 01/01/2019 - 20/01/2020
Total amount: 23.000 €
- 22 Name of the project:** A residential load scheduling with the integration of on-site pv and energy storage systems in micro-grid
Entity where project took place: Deanship of Scientific Research (DSR), King Abdulaziz University, Jeddah, under grant No. (DF-397-135-1441)
Name principal investigator (PI, Co-PI....): Muhammad Babar Rasheed
Start-End date: 01/11/2018 - 25/12/2019
Total amount: 23.000 €

Knowledge transfer and exchange

With over a 5+ years of research experience and 62 peer-reviewed publications, I have actively facilitated knowledge transfer and exchange across academia, industry, and policy sectors. My work spans power systems, smart grids, machine learning, and transportation, translating theoretical innovation into practical solutions. Through funded projects such as Horizon Europe and Marie Skłodowska-Curie Fellowships, I have led interdisciplinary collaborations involving utilities, regulators, and universities, delivering AI-driven energy optimization frameworks and demand response models. My research impact is evidenced by 2237 citations, an h-index of 26, and an i10-index of 45, reflecting sustained scholarly influence. I regularly disseminate findings through international conferences, technical workshops, and training programs, bridging the gap between research and implementation. My supervision of doctoral and postgraduate researchers has resulted in industry-relevant prototypes and publications, reinforcing co-creation of knowledge. I integrate open datasets, simulation platforms, and hardware tools into teaching and outreach, enabling stakeholders to adopt emerging technologies confidently. This approach ensures that research outcomes are not confined to academic silos but actively inform policy, empower industry, and enrich educational practice—advancing innovation through reciprocal, impactful knowledge exchange.

Scientific and technological activities

Scientific production

Publications, scientific and technical documents

- 1** Muhammad Babar Rasheed; María Dolores Rodríguez Moreno; Daniel Rodríguez García. An Optimization Cost Strategy for Storage-Enabled Hydrogen Flow Network using Monte Carlo Simulation . Journal of Energy Storage. 21/07/2025.
Type of production: Scientific paper
Total no. authors: 3 **Corresponding author:** Yes
Impact source: WOS (JCR)
Impact index in year of publication: 9.8
- 2** Muhammad Zulfiqar; Muhammad Babar Rasheed; Daniel Rodriguez; Maria D. R-Moreno. Blockchain-Based Energy Trading with Multi-Factor Trust: Ensuring Fairness and Security in Peer-to-Peer Energy Trading with Blockchain Technology. Sustainable Energy, Grids and Networks. pp. 1 - 25. Gianfranco Chicco, 19/07/2025. ISSN 2352-4677
Type of production: Scientific paper
Total no. authors: 4 **Corresponding author:** Yes
Impact source: SCOPUS (SJIR)
Impact index in year of publication: 5.6
- 3** Muhammad Babar Rasheed; Ángel Llamazares; Manuel Ocaña; Pedro Revenga. A game-theoretic approach to mitigate charging anxiety for electric vehicle users through multi-parameter dynamic pricing and real-time traffic flow. Energy. pp. 1 - 16. Prof. Dr. Ruzhu Wang, PhD, 20/11/2024.
Type of production: Scientific paper
Total no. authors: 4 **Corresponding author:** Yes
- 4** Muhammad Zulfiqar; Kelum A. A Gamage; Muhammad Babar Rasheed; Chris Gould. Optimised Deep Learning for Time-Critical Load Forecasting Using LSTM and Modified Particle Swarm Optimisation. Energies. 17 - 22, pp. 1 - 27. Vítor Monteiro, 05/11/2024.
Type of production: Scientific paper
Total no. authors: 4 **Corresponding author:** Yes
- 5** Muhammad Babar Rasheed; María D. R-Moreno. An integrated model with interdependent water storage for optimal resource management in Energy–Water–Food Nexus. Journal of Cleaner Production. pp. 1 - 15. Cecilia Maria Almeida, DsC, 25/05/2024.
Type of production: Scientific paper
Total no. authors: 2 **Corresponding author:** Yes
Impact source: WOS (JCR)
Impact index in year of publication: 10.0
- 6** TALHA NAEEM QURESHI; ZAHOOOR ALI KHAN; NADEEM JAVAID; ABDULAZIZ ALDEGHEISHHEM; MUHAMMAD BABAR RASHEED; NABIL ALRAJEH. Elephant Herding Robustness Evolution Algorithm With Multi-Clan Co-Evolution Against Cyber Attacks for Scale-Free Internet of Things in Smart Cities. IEEE Access. 11, pp. 79055 - 79072. Prof. Mehrdad Saif, 02/08/2023.



Type of production: Scientific paper
Total no. authors: 6
Impact source: WOS (JCR)
Impact index in year of publication: 3.4

Corresponding author: Yes

- 7** Muhammad Zulfiqar; Nahar F. Alshammari; Muhammad Babar Rasheed. Reinforcement Learning-Enabled Electric Vehicle Load Forecasting for Grid Energy Management. Mathematics. 11 - 7, pp. 1 - 20. Khaled M. Abo-Al-Ez, 31/03/2023.

Type of production: Scientific paper
Total no. authors: 3
Impact source: WOS (JCR)
Impact index in year of publication: 2.2

Corresponding author: Yes

- 8** Muhammad Zulfiqar; Muhammad Kamran; Muhammad Babar Rasheed; Thamer Alquthami; Ahmad H Milyani. A hybrid framework for short term load forecasting with a novel feature engineering and adaptive grasshopper optimization in smart grid. Applied Energy. 338, pp. 1 - 20. Zita A. Vale, PhD, Agregação (Habilitation), 10/03/2023.

Type of production: Scientific paper
Total no. authors: 5
Impact source: WOS (JCR)
Impact index in year of publication: 11.0

Corresponding author: Yes

- 9** Muhammad Babar Rasheed; María D. R-Moreno; Kelum A.A. Gamage. Artificial intelligence-enabled probabilistic load demand scheduling with dynamic pricing involving renewable resource. Energy Reports. 8, pp. 14034 - 14047. Annamaria Buonomano, PhD, 01/11/2022.

Type of production: Scientific paper
Total no. authors: 3

Corresponding author: Yes

- 10** Muhammad Zulfiqar; Muhammad Kamran; Muhammad Babar Rasheed; Thamer Alquathami; Ahmad H. Milyani. Hyperparameter optimization of support vector machine using adaptive differential evolution for electricity load forecasting. Energy Reports. 8, pp. 13333 - 13352. Annamaria Buonomano, PhD, 18/10/2022.

Type of production: Scientific paper
Total no. authors: 5

Corresponding author: Yes

- 11** Muhammad Zulfiqar; Muhammad Kamran; Muhammad Babar Rasheed; Thamer Alquthami; Ahmad H Milyani. A short-term load forecasting model based on self-adaptive momentum factor and wavelet neural network in smart grid. IEEE Access. 10, pp. 77587 - 77602. 19/07/2022.

Type of production: Scientific paper
Total no. authors: 5

Corresponding author: Yes

- 12** Muhammad Zulfiqar; Muhammad Kamran; Muhammad Babar Rasheed. A blockchain-enabled trust aware energy trading framework using games theory and multi-agent system in smart grid. Energy. 255, pp. 1 - 14. Prof. Dr. Ruzhu Wang, PhD, 13/06/2022.

Type of production: Scientific paper
Total no. authors: 3

- 13** Muhammad Zulfiqar; Muhammad Kamran; Kelum AA Gamage; Muhammad Babar Rasheed. Hyperparameter optimization of bayesian neural network using bayesian optimization and intelligent feature engineering for load forecasting. Sensors. 22 - 16, pp. 1. Antonio Fernández-Caballero, 12/06/2022.

Type of production: Scientific paper
Total no. authors: 4

Corresponding author: No

- 14** Thamer Alquthami; Muhammad Zulfiqar; Muhammad Kamran; Ahmad H Milyani; Muhammad Babar Rasheed. A performance comparison of machine learning algorithms for load forecasting in smart grid. IEEE Access. 10, pp. 48419 - 48433. 29/04/2022.
Type of production: Scientific paper
Total no. authors: 5
Corresponding author: Yes
- 15** Muhammad Junaid Tahir; Muhammad Babar Rasheed; Mohd Khairil Rahmat. Optimal placement of capacitors in radial distribution grids via enhanced modified particle swarm optimization. Energies. 15 - 7, pp. 1 - 27. Alban Kuriqi, 27/03/2022.
Type of production: Scientific paper
Total no. authors: 3
Corresponding author: No
- 16** Muhammad Babar Rasheed; María D R-Moreno. Minimizing pricing policies based on user load profiles and residential demand responses in smart grids. Applied Energy. 310, Zita A. Vale, PhD, Agregação (Habilitation), 15/03/2022.
Type of production: Scientific paper
Total no. authors: 2
Impact source: WOS (JCR)
Impact index in year of publication: 11.0
- 17** Sajid Rasheed; Muhammad Awais; Muhammad Waqar; Khuram Riaz; Muhammad Babar Rasheed; Muhammad Waseem Yaseen. Artificial intelligence based flood forecasting for river Hunza at danyor station in Pakistan. Archives of Hydro-Engineering and Environmental Mechanics. 69 - 1, pp. 59 - 77. 2022.
Type of production: Scientific paper
Total no. authors: 6
- 18** Mubashir Ali; Husnain Mushtaq; Muhammad Babar Rasheed; Anees Baqir; Thamer Alquthami. Mining software architecture knowledge: Classifying stack overflow posts using machine learning. Concurrency and Computation: Practice and Experience. 33 - 16, 25/08/2021.
Type of production: Scientific paper
Total no. authors: 5
Corresponding author: Yes
- 19** Muhammad Arsalan Ilyas; Thamer Alquthami; Muhammad Awais; Ahmad H Milyani; Muhammad Babar Rasheed. (DA-DOPF): A day-ahead dynamic optimal power flow with renewable energy integration in smart grids. Frontiers in Energy Research. 9, 23/08/2021.
Type of production: Scientific paper
Total no. authors: 5
Corresponding author: Yes
- 20** Thamer Alquthami; Ahmad H Milyani; Muhammad Awais; Muhammad Babar Rasheed. An incentive based dynamic pricing in smart grid: A customer's perspective. 13 - 11, 27/05/2021.
Type of production: Scientific paper
Total no. authors: 4
Corresponding author: Yes
- 21** M Wajahat Hassan; Thamer Alquthami; Ahmad H Milyani; Ashfaq Ahmad; Muhammad Babar Rasheed. A Joint Optimization Model for Energy and Reserve Capacity Scheduling With the Integration of Variable Energy Resources. IEEE Access. 9, 19/05/2021.
Type of production: Scientific paper
Total no. authors: 5
Corresponding author: Yes

- 22** Fasih Ullah Khan; Muhammad Awais; Muhammad Babar Rasheed; Bilal Masood; Yazeed Ghadi. A comparison of wireless standards in IoT for indoor localization using LoPy. IEEE Access. 9, pp. 65925 - 65933. 14/04/2021.
Type of production: Scientific paper
Total no. authors: 5
Corresponding author: Yes
- 23** Salman Raza; Muhammad Ayzed Mirza; Shahbaz Ahmad; Muhammad Asif; Muhammad Babar Rasheed; Yazeed Ghadi. A vehicle to vehicle relay-based task offloading scheme in vehicular communication networks. PeerJ Computer Science. 7, 13/04/2021.
Type of production: Scientific paper
Total no. authors: 6
Corresponding author: No
- 24** Bilal Masood; Song Guobing; Rizwan Ali Naqvi; Junjie Hou; Muhammad Babar Rasheed; Ateeq Ur Rehman. Measurements and channel modeling of low and medium voltage NB-PLC networks for smart metering. IET Generation, Transmission & Distribution. 15 - 2, pp. 321 - 338. 01/01/2021.
Type of production: Scientific paper
Total no. authors: 6
Corresponding author: No
- 25** Zhenqiang Wu; Hamza Fahim; Ismail Ben Mabrouk; Muath Al-Hasan; Shumaila Javaid; Muhammad Babar Rasheed. Feedforward neural network-based data aggregation scheme for intrabody area nanonetworks. IEEE Systems Journal. 16 - 2, pp. 1796 - 1807. 29/12/2020.
Type of production: Scientific paper
Total no. authors: 6
- 26** Bilal Masood; Song Guobing; Sobia Baig; Muhammad Babar Rasheed; Junjie Hou. Measurements and characterisation of low and medium voltage residential, commercial, and industrial NB-PLC networks for AMI. IET Generation, Transmission & Distribution. 14 - 26, pp. 6663 - 6673. 01/12/2020.
Type of production: Scientific paper
Total no. authors: 5
Corresponding author: No
- 27** Amir H Forghan; Muath Al Hassan; Ismail Ben Mabrouk; Amber Sultan; Muhammad Babar Rasheed. Exact analysis of the multihop multibranch hybrid AF/DF relaying networks. International Journal of Communication Systems. 33 - 15, 01/10/2020.
Type of production: Scientific paper
Total no. authors: 5
Corresponding author: Yes
- 28** Muhammad Arsalan Ilyas; Ghulam Abbas; Muhammad Awais; Thamer Alquthami; Muhammad Babar Rasheed. Multi-objective optimal power flow with integration of renewable energy sources using fuzzy membership function. IEEE Access. 8, 03/08/2020.
Type of production: Scientific paper
Total no. authors: 5
Corresponding author: Yes
- 29** Hamza Fahim; Muath Al Hasan; Ismail Ben Mabrouk; Wei Li; Shumaila Javaid; Muhammad Babar Rasheed. An efficient routing scheme for intrabody nanonetworks using artificial bee colony algorithm. IEEE access. 8, 25/06/2020.
Type of production: Scientific paper
Total no. authors: 6
Corresponding author: Yes
- 30** Bilal Masood; Rao M Asif; Saif Ur Rehman; Ateeq Ur Rehman; Guobing Song; Sobia Baig; M Arif Khan; Muhammad Babar Rasheed. Investigation of deterministic, statistical and parametric NB-PLC channel modeling techniques for advanced metering infrastructure. Energies. 13 - 12, 15/06/2020.
Type of production: Scientific paper
Total no. authors: 8
Corresponding author: No

- 31** Ameena Saad Al-Sumaiti; Srikanth Reddy; Motahareh Pourbehzadi; Magdy Salama; Abdollah Kavousi-Fard; Muhammad Babar Rasheed. Economic assessment of distributed generation technologies: A feasibility study and comparison with the literature. *Energies*. 13 - 11, 01/06/2020.
Type of production: Scientific paper
Total no. authors: 6 **Corresponding author:** No
- 32** Zubair Khalid; Thamer Alquthami; Muhammad Awais; Ghulam Abbas; Muhammad Babar Rasheed. A novel load scheduling mechanism using artificial neural network based customer profiles in smart grid. *Energies*. 13 - 5, 29/02/2020.
Type of production: Scientific paper
Total no. authors: 5 **Corresponding author:** Yes
- 33** Muhammad Babar Rasheed; Muhammad Awais; Thamer Alquthami; Irfan Khan. An optimal scheduling and distributed pricing mechanism for multi-region electric vehicle charging in smart grid. *IEEE Access*. 8, pp. 40298 - 40312. 27/02/2020.
Type of production: Scientific paper
Total no. authors: 4 **Corresponding author:** Yes
- 34** Muhammad Babar Rasheed; Muhammad Awais Qureshi; Nadeem Javaid; Thamer Alquthami. Dynamic pricing mechanism with the integration of renewable energy source in smart grid. *IEEE Access*. 8, pp. 16876 - 16892. 20/01/2020.
Type of production: Scientific paper
Total no. authors: 4 **Corresponding author:** Yes
- 35** Ihsan Ullah; Muhammad Babar Rasheed; Thamer Alquthami; Shahzadi Tayyaba. A residential load scheduling with the integration of on-site pv and energy storage systems in micro-grid. *Sustainability*. 12 - 1, 25/12/2019.
Type of production: Scientific paper
Total no. authors: 4 **Corresponding author:** Yes
- 36** Aqdas Naz; Musaed Alhussein; Abdul Haseeb; Muhammad Babar Rasheed; Nadeem Javaid; Khursheed Aurangzeb. Game theoretical energy management with storage capacity optimization and photo-voltaic cell generated power forecasting in micro grid. *Sustainability*. 11 - 10, 14/05/2019.
Type of production: Scientific paper
Total no. authors: 6 **Corresponding author:** No
- 37** Muhammad Babar Rasheed; Muhammad Hasanain Chaudary; Muhammad Kashif Hanif; Muhammad Asif; Muhammad Sheraz Arshad Malik; Nadeem Javaid. Intelligent multi-agent based multilayered control system for opportunistic load scheduling in smart buildings. *IEEE Access*. 7, 18/02/2019.
Type of production: Scientific paper
Total no. authors: 6 **Corresponding author:** Yes
- 38** Urooj Asghar; Amer Alzaidi; Ihsan Ali; Atiq Ur-Rahman; Ameena Saad Al-Sumaiti; Muhammad Babar Rasheed; Abdullah Alamri. Smart energy optimization using heuristic algorithm in smart grid with integration of solar energy sources. *Energies*. 11 - 12, 14/12/2018.
Type of production: Scientific paper
Total no. authors: 7 **Corresponding author:** Yes
- 39** Muhammad Wajahat Hassan; Muhammad Babar Rasheed; Muhammad Akmal; Waseem Nazar; Nadeem Javaid. Co-optimization of energy and reserve capacity considering renewable energy unit with uncertainty. *Energies*. 11 - 10, 20/10/2018.
Type of production: Scientific paper
Total no. authors: 5 **Corresponding author:** Yes



- 40** Nadeem Javaid; Zafar Iqbal; Muhammad Babar Rasheed; Nabil Alrajeh; Shahid Ahmed Khan; Danish Mahmood; Mudassar Naseem. A new heuristically optimized Home Energy Management controller for smart grid. Sustainable cities and society. 34, 01/10/2017.
Type of production: Scientific paper
Total no. authors: 7
Corresponding author: No
- 41** Muhammad Babar Rasheed; Athanasios Vasilakos; Umar Qasim; Zahoor Ali Khan; Muhammad Imran; Nadeem Javaid. Delay and energy consumption analysis of priority guaranteed MAC protocol for wireless body area networks. Wireless networks. 23 - 4, 01/05/2017.
Type of production: Scientific paper
Total no. authors: 6
Corresponding author: No
- 42** Muhammad Babar Rasheed; Umer Qasim; Zahoor Ali Khan; Muhammad Awais; Ashfaq Ahmad; Nadeem Javaid; Nabil Alrajeh. Priority and delay constrained demand side management in real-time price environment with renewable energy source. International Journal of Energy Research. 40 - 14, 01/11/2016.
Type of production: Scientific paper
Total no. authors: 7
Corresponding author: No
- 43** Muhammad Babar Rasheed; Umar Qasim; Zahoor Ali Khan; Mohsin Jamil; Ashfaq Ahmad; Nadeem Javaid; Nabil Alrajeh. Energy optimization in smart homes using customer preference and dynamic pricing. Energies. 9 - 8, 27/07/2016.
Type of production: Scientific paper
Total no. authors: 7
Corresponding author: No
- 44** Muhammad Babar Rasheed; Nadeem Javaid; Zafar Iqbal; Nabil Alrajeh; Umar Qasim; Zahoor Ali Khan; Muhammad Awais; Qaisar Javaid. Real time information based energy management using customer preferences and dynamic pricing in smart homes. Energies. 9 - 7, 14/07/2016.
Type of production: Scientific paper
Total no. authors: 8
Corresponding author: No
- 45** Muhammad Babar Rasheed; Nadeem Javaid; Nabil Alrajeh; Umar Qasim; Zahoor Ali Khan; Ashfaq Ahmad. An efficient power scheduling scheme for residential load management in smart homes. Applied Sciences. 5 - 4, 12/11/2015.
Type of production: Scientific paper
Total no. authors: 6
Corresponding author: No
- 46** Nadeem Javaid; Muhammad Babar Rasheed; Turki Ali Alghamdi; Zahoor Ali Khan; Mohsen Guizani; Muhammad Imran; Manzoor Ilahi. An energy-efficient distributed clustering algorithm for heterogeneous WSNs. EURASIP Journal on Wireless communications and Networking. 1 - 151, 04/06/2015.
Type of production: Scientific paper
Total no. authors: 7
Corresponding author: No
- 47** Malik Anas Ahmad; Yasar Ayaz; Waqas Majeed; Nadeem Ahmed Khan; Muhammad Imran; Syed Omer Gillani; Mohsin Jamil; Muhammad Babar Rasheed; Nadeem Javaid. Comparative Analysis of Classifiers for Developing an Adaptive Computer-Assisted EEG Analysis System for Diagnosing Epilepsy. BioMed research international. 2015 - 1, 2015.
Type of production: Scientific paper
Total no. authors: 9
Corresponding author: No

Works submitted to national or international conferences

- 1** **Title of the work:** Short-Term Load Forecasting using Conditionally Restricted Boltzman Machine Optimized by Modified Grasshopper Optimization Algorithm
Name of the conference: 2023 IEEE Power & Energy Society Innovative Smart Grid Technologies Conference (ISGT)
Date of event: 16/01/2023
End date: 16/01/2023
Organising entity: IEEE Power & Energy Society
City organizing entity: United States of America
Muhammad Zulfiqar; Muhammad Babar Rasheed; María D R-Moreno.
- 2** **Title of the work:** Modeling and Optimizing the Integrated Energy-Water Nexus for Hydrogen Generation
Name of the conference: International Conference on Frontiers of Information Technology (FIT)
Type of event: Conference
Type of participation: Participatory - oral communication
Date of event: 12/12/2022
Organising entity: Frontiers of Information Technology (FIT)
City organizing entity: Pakistan
Muhammad Babar Rasheed; María D R-Moreno.
- 3** **Title of the work:** Short-Term Load Forecasting using Long Short Term Memory Optimized by Genetic Algorithm
Name of the conference: IEEE Sustainable Power and Energy Conference (iSPEC)
Type of event: Conference
Type of participation: Participatory - oral communication
Date of event: 04/12/2022
Organising entity: IEEE Sustainable Power and Energy Conference
City organizing entity: Australia
Muhammad Zulfiqar; Muhammad Babar Rasheed.
- 4** **Title of the work:** The energy-water-food nexus architecture for the optimal resource allocation
Name of the conference: IEEE PES innovative smart grid technologies europe (ISGT europe)
Type of event: Conference
Type of participation: Participatory - oral communication
Date of event: 18/10/2021
Organising entity: IEEE PES innovative smart grid technologies
City organizing entity: Finland
Muhammad Babar Rasheed; Maria D R-Moreno.
- 5** **Title of the work:** An assessment of different electricity tariffs on residential photovoltaic system profitability: Australian case study
Name of the conference: 2nd International Conference on Smart Grid and Renewable Energy (SGRE)
Type of event: Conference
Type of participation: Participatory - oral communication
Date of event: 19/11/2019
Organising entity: International Conference on Smart Grid and Renewable Energy
Type of entity: University



City organizing entity: Qatar

Rafah Ahmed Al Arrouqi; Omar Ellabban; Luluwah Al-Fagih; Muhammad Babar Rasheed.

- 6** **Title of the work:** Building energy management system: An overview of recent literature research
Name of the conference: Advances in Science and Engineering Technology International Conferences (ASET)
Type of event: Conference
Type of participation: Participatory - oral communication
Date of event: 26/03/2019
Organising entity: The Higher Colleges of Technology
City organizing entity: United Arab Emirates
Safa Alattas Alhashmi; Ameena Saad Al-Sumaiti; Muhammad Babar Rasheed; Ehsan Heydarian-Forushani.
- 7** **Title of the work:** Demand response benefits for load management through heuristic algorithm in smart grid
Name of the conference: International Symposium on Recent Advances in Electrical Engineering (RAEE)
Type of event: Conference
Type of participation: Participatory - oral communication
Date of event: 17/10/2018
Organising entity: Pakistan Institute of Engineering and Applied Sciences (PIEAS) **Type of entity:** R&D Centre
City organizing entity: Pakistan
Urooj Asghar; Muhammad Babar Rasheed; Muhammad Awais.
- 8** **Title of the work:** Multiple user based residential energy management scheme for smart homes
Name of the conference: 1st International Conference on Power, Energy and Smart Grid (ICPESG)
Type of event: Conference
Type of participation: Participatory - oral communication
Date of event: 09/04/2018
Organising entity: IEEE
City organizing entity: Pakistan
Muhammad Awais; Muhammad Babar Rasheed; Muhammad Usman; Zahid Iqbal.
- 9** **Title of the work:** A novel pricing mechanism for demand side load management in smart grid
Name of the conference: 31st international conference on advanced information networking and applications workshops (WAINA)
Type of event: Conference
Type of participation: Participatory - oral communication
Date of event: 27/03/2017
Organising entity: 31st international conference on advanced information networking and applications workshops (WAINA)
City organizing entity: Austria
Muhammad Babar Rasheed; Nadeem Javaid; Muhammad Awais; Mariam Akbar; Zahoor Ali Khan.
- 10** **Title of the work:** Multiagent control system for residential energy management under real time pricing environment
Name of the conference: IEEE 31st International Conference on Advanced Information Networking and Applications (AINA)
Type of event: Conference
Type of participation: Participatory - oral communication
Date of event: 27/03/2017
Organising entity: IEEE Computer Society, Tamkang University

City organizing entity: Taiwan

Muhammad Babar Rasheed; Nadeem Javaid; Sardar Mehboob Hussain; Mariam Akbar; Zahoor Ali Khan.

- 11 Title of the work:** Transient stability analysis of an islanded microgrid under variable load
Name of the conference: 19th International Conference on Network-Based Information Systems (NBIS)
Type of event: Conference
Type of participation: Participatory - oral communication
Date of event: 07/09/2016
Organising entity: Technical University of Ostrava
City organizing entity: Czech Republic
Muhammad Babar Rasheed; Muhammad Awais; Umar Javaid; Waseem Nazar; Nadeem Javaid; Zahoor Ali Khan.
- 12 Title of the work:** An energy efficient residential load management system for multi-class appliances in smart homes
Name of the conference: 18th International Conference on Network-Based Information Systems
Type of event: Conference
Type of participation: Participatory - oral communication
Date of event: 02/09/2015
Organising entity: IEEE Computer Society
City organizing entity: Taiwan
Muhammad Babar Rasheed; Muhammad Awais; FA Chaudhry; A Khurshid; Zafar Iqbal; Nadeem Javaid; A Ilahi.
- 13 Title of the work:** Evaluation of human activity recognition and fall detection using android phone
Name of the conference: IEEE 29th International Conference on Advanced Information Networking and Applications
Type of event: Conference
Type of participation: Participatory - oral communication
Date of event: 24/03/2015
Organising entity: IEEE Technical Committee on Distributed Processing (TCDP)
Muhammad Babar Rasheed; Nadeem Javaid; M Haris Baidar Raja; Zahoor Ali Khan; Umar Qasim; Turki Ali Alghamdi.
- 14 Title of the work:** An energy consumption analysis of beacon enabled slotted CSMA/CA IEEE 802.15.4
Name of the conference: 28th International Conference on Advanced Information Networking and Applications Workshops
Type of event: Conference
Type of participation: Participatory - oral communication
Date of event: 13/05/2014
Organising entity: IEEE Computer Society
City organizing entity: Canada
Muhammad Babar Rasheed; Nadeem Javaid; Arsalan Haider; Zahoor Ali Khan; Umar Qasim; Turki Ali Alghamdi.
- 15 Title of the work:** M-GEAR: Gateway-based energy-aware multi-hop routing protocol for WSNs Authors
Name of the conference: Eighth international conference on broadband and wireless computing, communication and applications
Type of event: Conference
Type of participation: Participatory - oral communication
Date of event: 28/10/2013
Organising entity: Institute of Electrical and Electronics Engineers

**City organizing entity:** Spain

Qaisar Nadeem; Muhammad Babar Rasheed; Yousaf Maqsood; Zahoor Ali Khan; Nadeem Javaid; Ahmad Din.

16 Title of the work: E-HORM: An energy-efficient hole removing mechanism in Wireless Sensor Networks

Name of the conference: 26th IEEE Canadian Conference on Electrical and Computer Engineering (CCECE)

Type of event: Conference

Type of participation: Participatory - oral communication

Date of event: 05/05/2013

Organising entity: IEEE

City organizing entity: Canada

Muhammad Babar Rasheed; Nadeem Javaid; Zahoor Ali Khan; Umar Qasim; M Ishfaq.

R&D management and participation in scientific committees

Evaluation and revision of R&D projects and articles

1 Performed tasks: Evaluated master's and undergraduate projects in engineering
Entity where activity was carried out: University of Gloucestershire, UK
City of entity: Gloucestershire, Gloucestershire, Wiltshire and North Somerset, United Kingdom
Start-End date: 09/01/2023 - 02/12/2025

2 Name of the activity: Reviewing
Performed tasks: Conducted detailed peer reviews for over 50 articles.
Entity where activity was carried out: Across IEEE, **Type of entity:** R&D Centre Elsevier, Wiley, and MDPI journals, focusing on smart grids, machine learning, and energy optimization.
City of entity: Cheltenham, Gloucestershire, Wiltshire and North Somerset, United Kingdom
Start-End date: 09/01/2023 - 23/07/2025

3 Performed tasks: Evaluation of Funded Research Proposals
Entity where activity was carried out: UK, USA, **Type of entity:** University Research Institute KSA, and EU, including Horizon Europe and MICINN Spain
City of entity: Alcala de Henares, Community of Madrid, Spain
Start-End date: 25/01/2021 - 13/05/2023

4 Name of the activity: Academic Thesis Examination
Performed tasks: Evaluated doctoral and master's theses in electrical engineering, AI, and energy systems across multiple universities
Entity where activity was carried out: Higher Education Commission (HEC) of Pakistan
City of entity: Lahore, Pakistan
Start-End date: 22/08/2017 - 18/01/2021



Other achievements

Stays in public or private R&D centres

- 1** **Entity:** COMSATS University, Islamabad, Pakistan **Type of entity:** University Research Institute
City of entity: Islamabad, Pakistan
Start-End date: 01/09/2013 - 13/08/2017 **Duration:** 3 years - 1 month - 12 days
Goals of the stay: Doctorate
Provable tasks: During my doctoral studies at COMSATS University (2013–2017), I actively contributed to multiple research projects focused on intelligent energy management, AI-driven optimization, and control systems. These included the development of demand-side load management algorithms, predictive models using machine learning, and metaheuristic-based control strategies for smart grid applications and wireless sensor networks.
Type of stay: Investigación
- 2** **Entity:** Center for advanced studies in telecommunications **Type of entity:** University Research Institute
Faculty, institute or centre: Engineering
City of entity: Islamabad, Pakistan
Start-End date: 12/02/2011 - 14/03/2013 **Duration:** 2 years - 28 days
Goals of the stay: Contracted
Provable tasks: During my master's studies, I focused on developing advanced algorithms for network optimization and energy hole detection in wireless sensor networks, enhancing system longevity and routing efficiency. I also contributed to healthcare data analytics, applying machine learning techniques to classify patient activity patterns, and worked on the design and evaluation of medium access control (MAC) protocols, including CSMA/CA and CDMA, to improve throughput and energy efficiency under dynamic network conditions.
Type of stay: Investigación
- 3** **Entity:** SABRO Technologies **Type of entity:** R&D Centre
Faculty, institute or centre: Research and Development Center
City of entity: Islamabad, Pakistan
Start-End date: 01/01/2011 - 30/06/2011 **Duration:** 6 months
Goals of the stay: Contracted
Type of stay: Desarrollo Tecnológico

Obtained grants and scholarships

- 1** **Name of the grant:** Marie Skłodowska-Curie Action (MSCA) Individual Post Doctoral Fellowship
Aims: Post-doctoral
Awarding entity: Horizon 2020 under COFUND **Type of entity:** University
Conferral date: 25/01/2021 **Duration:** 2 years - 2 months - 28 days
End date: 13/05/2023
Entity where activity was carried out: University of Alcalá (UAH), Madrid, Spain

**2 Name of the grant:** International Research Support Initiative Program (IRSIP)**Aims:** Pre-doctoral**Awarding entity:** Higher Education Commission (HEC) of Pakistan**Type of entity:** University**Conferral date:** 29/09/2016**Duration:** 5 months - 6 days**End date:** 03/03/2017**Entity where activity was carried out:** Dartmouth College, USA**3 Name of the grant:** Erasmus Mundus Doctoral Scholarship**Aims:** Pre-doctoral**Awarding entity:** Erasmus**Conferral date:** 2013**Entity where activity was carried out:** Anglia Ruskin University, UK**Other types of collaboration with researchers or technologists****1 Type of relationship:** Co-ordinated projects**Description of the collaboration:** I am collaborating with Staffordshire University on the project: IoT enabled digital twin model for collaborative transportation network**Participating entity/entities:**

University of Staffordshire

Type of entity: University**City participating entity:** University, Shropshire and Staffordshire, United Kingdom**Start date:** 13/08/2025**2 Type of relationship:** Participation in long term collaboration agreements between bodies**Description of the collaboration:** I am contributing to the development of an intelligent digital twin framework focussing on electric vehicle management, optimal routing, and integrated logistics management. The project aims to design Agentic_AI-driven algorithms to optimize the vehicle routing and navigation problems based on realistic conditions, energy consumption profiles, and operational constraints.**Participating entity/entities:**

University of Alcalá

Type of entity: University**City participating entity:** Alcalá de Henares, Community of Madrid, Spain**Start date:** 01/07/2025**3 Type of relationship:** Co-ordinated projects**Name principal investigator (PI, Co-PI....):** P Ravenga; Ángel Llamazares Llamazares**Description of the collaboration:** With the University of Alcalá, I am contributing to the development of an intelligent transportation system focused on fleet management, optimal route planning, and integrated energy management. The project aims to design AI-driven algorithms that dynamically optimize vehicle routing and navigation based on traffic conditions, energy consumption profiles, and operational constraints.**Start date:** 01/03/2025**Duration:** 5 months - 23 days**4 Type of relationship:** Networks without joint project**Name principal investigator (PI, Co-PI....):** Aamir Sohail; Muhammad Babar Rasheed**Description of the collaboration:** In collaboration with AMD, I am contributing to the development of AI-driven verification algorithms for Application-Specific Integrated Circuits (ASICs), targeting next-generation computational architectures. The objective is to enhance verification efficiency and scalability by integrating machine learning techniques that automate test generation, accelerate bug localization, and ensure robust validation of complex hardware designs for future AI and high-performance computing systems.

**Start date:** 21/12/2024**Duration:** 1 year - 7 months - 12 days**5 Type of relationship:** Co-ordinated projects**Name principal investigator (PI, Co-PI....):** Muhammad Babar Rasheed; Prof. Xiandong Ma

Description of the collaboration: In collaboration with Lancaster University and Southern Methodist University, I am co-developing an integrated Energy-Water-Hydrogen (EWH) Nexus optimization framework to support resource-efficient planning across multivector energy networks. The activity involves interdisciplinary modeling of interconnected systems using advanced optimisation techniques to address carbon-neutral transitions, demand forecasting, and techno-economic trade-offs. Our joint efforts focus on translating academic research into deployable algorithms for sustainable resource allocation, supported by real-world data and stakeholder engagement. This work contributes to the design of scalable, resilient energy infrastructures and fosters transatlantic knowledge exchange in decarbonisation strategies.

Start date: 13/09/2024**Duration:** 1 year - 1 month**6 Type of relationship:** Joint project networks**Name principal investigator (PI, Co-PI....):** Muhammad Babar Rasheed; Muhammad Zulfiqar

Description of the collaboration: With the Higher Education Commission of Pakistan, I am contributing on developing long-term electricity load forecasting algorithms. The objective is to design robust, data-driven models that integrate socio-economic indicators, weather variables, and historical consumption patterns to predict future electricity demand across residential, commercial, and industrial sectors.

Start date: 09/07/2024**Duration:** 1 year - 12 days**Scientific societies and professional associations****1 Name of the society:** Fellow of the Higher Education Academy (FHEA)**Affiliation entity:** Advance HE**City affiliation entity:** York, West Yorkshire, United Kingdom**Start date:** 06/08/2024**2 Name of the society:** Senior Member IEEE (SMIEEE)**Affiliation entity:** Institute of Electrical and Electronics Engineers**City affiliation entity:** New York, United States of America**Start date:** 2019**3 Name of the society:** International Association of Engineers**Affiliation entity:** World Congress on Engineering**City affiliation entity:** Hong Kong, Hong Kong**Start date:** 2018**Editorial councils****1 Name of the editorial council:** Guest Editor of the Journal of Information Security and Cybercrimes Research (JISCR)**Affiliation entity:** Naif Arab University for Security Sciences (NAUSS)**City affiliation entity:** NaifNaif, Saudi Arabia**Start date:** 17/05/2025**2 Name of the editorial council:** Associate Editor for Grid Efficiency, a speciality section of Frontiers In Smart Grids**Affiliation entity:** Universidad de Alcalá



City affiliation entity: Alcala de Henares, Alcala de Henares, Spain

Start date: 2024

Duration: 2 years

3 Name of the editorial council: Guest Editor in Frontiers in Smart Grids

Affiliation entity: Universidad de Alcalá

Type of entity: University

City affiliation entity: Alcala de Henares, Alcala de Henares, Spain

Start date: 2023

Duration: 2 years

4 Name of the editorial council: Associate Editor, Pakistan Journal of Engineering and Technology (PAKJET)

Affiliation entity: The University of Lahore, Lahore, Pakistan.

City affiliation entity: LahoreLahore, Pakistan

Start date: 2018

Duration: 8 years

Co-operation networks

1 Name of the network: Leverhulme Trust, UK

Identification of the network: Power and Energy System

Participating entity/entities: University of Lancaster

Start date: 01/02/2025

Duration: 5 months - 21 days

2 Name of the network: Team Dr. Inam Ullah

Participating entity/entities: Southern Methodist University, TX, USA

Start date: 20/09/2024

Duration: 9 months - 21 days

3 Name of the network: Power and Energy Systems

Participating entity/entities: University of Gloucestershire

Start date: 15/05/2023

Duration: 2 years - 6 months

4 Name of the network: RobeSage Research Group

Participating entity/entities: Universidad de Alcalá

Start date: 13/05/2023

Type of entity: University

Duration: 2 years - 1 month - 28 days

5 Name of the network: Intelligent System Group (ISG)

Identification of the network: Artificial Intelligence

Participating entity/entities: Universidad de Alcalá

Start date: 25/01/2023

Type of entity: University

Duration: 4 years - 5 months

6 Name of the network: Power System Research Group

Participating entity/entities: University of Lahore

Start date: 18/06/2018

Type of entity: University

Duration: 7 years - 6 months

7 Name of the network: Laboratory for Intelligent Integrated Networked Systems (LIINES)

Participating entity/entities: Dartmouth College, USA

Type of entity: University

Start date: 29/09/2016

8 Name of the network: Communication over Sensors Research Group

Participating entity/entities: COMSATS University

Type of entity: University

Islamabad, Pakistan

**Start date:** 01/02/2011**Duration:** 14 years - 7 months

Prizes, mentions and distinctions

- 1** **Description:** Visiting Researcher
Awarding entity: Newcastle University, UK
City awarding entity: Newcastle, North Yorkshire, United Kingdom
Conferral date: 2023
- 2** **Description:** Global Talent Visa (GTV) under Exceptional Promise
Awarding entity: Royal Academy of Engineering, UK
City awarding entity: London, Inner London, United Kingdom
Conferral date: 2022
- 3** **Description:** Eminent Researcher of the year award
Awarding entity: The University of Lahore, Pakistan
City awarding entity: Lahore, Pakistan
Conferral date: 2020
- 4** **Description:** Research Productivity Award
Awarding entity: COMSATS University, Islamabad, Pakistan
City awarding entity: Islamabad, Pakistan
Conferral date: 2016
- 5** **Description:** Research Productivity Award
Awarding entity: COMSATS University, Islamabad, Pakistan
City awarding entity: Islamabad, Pakistan
Conferral date: 2014
- 6** **Description:** Senior Member
Awarding entity: Institute of Electrical and Electronics Engineering
City awarding entity: New York, United States of America

Periods of research activity and knowledge transfer

Name of the action: Teaching
Certifying entity: Advance HE
Date of recognition: 16/05/2024
Score observed: Completion
Starting year: 16/02/2024
Completion date: 2024
Call year: 2023