Curriculum Vitae

Shahzad Ali Malik, Ph.D.

Professor,
Department of Electrical and Computer Engineering,
COMSATS University Islamabad (CUI),
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EDUCATION

Ph.D. – Computer Science and Networks   02/1999 - 05/2002

TelecomParis, Ecole Nationale Supérieure des Télécommunications (ENST), Paris, France

Dissertation: "Radio Resource Allocation and Performance Analysis for UMTS WCDMA Networks Offering Multimedia Services"

M.S. (D.E.A.) - Digital Telecommunication Systems   10/1997- 10/1998

TelecomParis, Ecole Nationale Supérieur des Télécommunications (ENST), Paris, France

M.S. (Mastère Spécialisé) - Communication Systems and Networks   09/1996 - 09/1997

Ecole Nationale Supérieur d'Electrotechnique, d'Electronique, d'Informatique et d'Hydraulique de Toulouse (ENSEEIHT), Toulouse, France

B.Sc. Engineering - Electrical (Communications and Electronics)   04/1985 - 02/1991

University of Engineering and Technology, Lahore, Pakistan

EXPERIENCE SUMMARY

Professor	COMSATS University Islamabad (CUI), Islamabad, Pakistan	02/2011 – to date
Associate Professor	COMSATS Institute of Information Technology (CIIT), Pakistan	03/2007 – 02/2011
Assistant Professor	National University of Sciences and Technology, Pakistan	10/2004 – 02/2007
Research Fellow	Ryerson University, Toronto, Canada	04/2003 – 09/2004
R & D Engineer	National Institute of Telecommunications (INT), Evry, France	09/2002 – 03/2003
Research Assistant	National Institute of Telecommunications (INT), Evry, France	02/1999 – 06/2002
Assistant Engineer	Pakistan Telecommunication Company Limited, Pakistan	05/1993 – 06/1996
Consulting Engineer	National Engineering Services Pakistan, Tarbela, Pakistan	10/1991 – 05/1993

Academic Management and Coordination:

Dean, Faculty of Engineering, COMSATS University Islamabad, Islamabad, Pakistan	02/2021 – to date
Incharge, Graduate Programs, Department of Electrical engineering, CUI, Islamabad	02/2016 – 02/2021
Dean, Faculty of Engineering, COMSATS IIT (CIIT), Pakistan	04/2012 – 06/2014
Chairperson, Department of Electrical Engineering, CIIT, Islamabad	04/2011 – 05/2012
Head, Department of Electrical Engineering, CIIT, Islamabad	11/2008 – 09/2011
Incharge, Student Affairs, Islamabad Campus, CIIT, Pakistan	07/2011 – 06/2012

TEACHING

Undergraduate: Wireless Communications, Digital Communications, Principles of Communication Systems, Data Communications and Computer Networks, Mobile Communications, Microprocessor Based Design, Electric Circuit Analysis, Probability Methods in Engineering.

Graduate: Mobile Communications Systems, Advanced Computer Networks, Network and Computer Security, Wireless Communication Techniques, Advanced Digital Communications, Mobile Cellular Systems and Standards, Personal and Mobile Communications, Mobile Broadband Networks, Wireless Networks, Performance Evaluation of Computer Networks, Internet Architecture and Protocols, IP Routing and Internetwork Design, Mobile Computing, Performance Analysis of Communication Systems, Renewable Energy Technologies, Engineering Mathematics.

RESEARCH

Research Interests:
Mobile Wireless Systems and Networks -- Cellular 6G/5G/4G – LTE, LTE-A, LTE-Pro; IEEE802.11 WLANs; Cognitive Radio Networks (CRNs); Device-to-Device (D2D) Communication; Evaluation, Enhancement and optimization of Protocols for Wired/Wireless Networks; Simulation Modeling and Performance Analysis of Communication Systems and Networks.
Internet of Things (IoT) – Fog/Edge Computing, Cyber-Physical Systems, Relay Optimization, IoT Application in Healthcare, Transport, Smart Cities and Home Automation
Information Security -- Public Key Cryptography (PKC); Protocols for Key Establishment and Exchange in D2D Communication, D2D Group Security
Energy and Power System -- Renewable Energy Technologies; Smart Grids; Micro/Pico Grids; Hybrid Energy Systems; Grid Integration of Renewables; Modeling, Simulation and Performance Analysis of Renewable Energy Systems.

Research Supervision:

Ph.D. Thesis		M.S. Thesis		B.S. Projects	
Completed	In Progress	Completed	In Progress	Completed	In Progress
8	-	25	0	30+ (70+ Students)	-

Patents and Funded Projects:

Patents		Funding Projects	
Granted	Filed	Completed	In Progress
1	-	3	0

Research Publication Summary:

Journals (Impact Factor)	Conferences	Journals (Other)
42 (68.5)	19	21

COMMITTEE WORK, SERVICE TO PROFESSION AND SOCIETY

Service to Profession and Society:

- Program Evaluator (PEV) and Team Lead, Pakistan Engineering Council (PEC) for Accreditation of Engineering Programs (2008-to date)
- Evaluator/Member Assessment Team, QEC, School of Engineering, NUCES-FAST Islamabad (2019)
- Member, Selection Board, Mirpur University of Sciences and Technology (MUST) Mirpur, AJK (2018)
- Member, Selection Board, Muzaffarabad University, AJK (2018)
- Member, Selection Board, UET Peshawar, Pakistan (2012 – 2018)
- Member, National Curriculum Review Committees (NCRC) for Electrical and Computer Engineering, Higher Education Commission (HEC), Pakistan (2008-2014)
- Member, Faculty Council, Sukkur Institute of Business Administration (SIBA), Pakistan (2010-2012)
- Member, Academic Council, Air University Islamabad, Pakistan (2011)
- Member, Board of Studies, International Islamic University Islamabad, Pakistan (2011-2012)

Committee Work:

- Convener, Board of Faculty of Engineering, CUI, Islamabad (03/2021 – to date)
- Convener, Ph.D. Defense Committee, Faculty of Engineering (03/2021 – to date)
- Convener, ORIC Advisory Committee, CUI Islamabad (11/2021 – to date)
- Member, Consultative Committee - 3rd Phase of Drafting of CUI Statutes, Rules, and Regulations (03/2023 – to date)
- Member of Several CUI Statutory Bodies (Syndicate, Selection Board, Academic Council, Deans Committee, Dean and Chairpersons Committee, FMPC) (03/2021 – to date)
- Convener, Committee on Performance Criteria for Tenured Faculty (03/2022 – 05/2023)
- Convener, Committee to Review In-House PhD Incentive Scheme, CUI (12/2021 – 06/23)
- Convener, Harassment and Abuse of Authority Committee, CUI, Islamabad Campus (03/2021 – 03/2023)
- Member, Task Force to Develop Strategic Vision and Implementation Plan of CUI (05/2021 – 06/2022)
- Member, Committee for Defining Course/Work Load for Faculty at CUI (12/2021 – 04/2022)
- Convener, B-Group Sub-Committee of Consultative Committee for CUI Statutes (11/2020 – 06/2022)
- Convener, Financial Support Committee, CUI, Islamabad Campus (2012 – 2016)
- Convener, ISAC for National Endowment Scholarship for Talent (NEST) Program, CUI (2018)
- Convener, Committee for Erasmus Mundus Mobility Programs, CU, Islamabad (2018, 2019)
- Convener, OG Employees Committee, CIIT, Islamabad Campus (2018 – 2019)
- Member, TTS Terminal Contracts Committee, CUI, Islamabad (2018)
- Convener, Internal Evaluation Committee, Funding Proposals, CIIT, Islamabad Campus (2012 – 2015)
- Convener, Workshop on New Energy Technologies, PCBF 2015, CIIT (2015)
- Convener, Outcome Based Education (OBE) Committee, EE Dept., Islamabad Campus (2014-2016)
- Convener, Campus Graduate Programs Committee, CIIT Islamabad Campus (2012-2014)
- Convener, Outcome Based Education (OBE) Committee, Electrical Engineering, CIIT Islamabad (2013)
- Member, Unfair Means Control Committee, CIIT, Islamabad Campus (2012 – 2017)
- Served on several departmental committees related to curriculum review, faculty recruitment, program coordination and projects

Other:

- Delivered training on "Outcome Based Education/Learning (OBE/OBL)" at CUI Sahiwal Campus (2023)
- Delivered training on "4G/5G and Next Generation Mobile Systems, Communication in Signal Processing' to engineers under Continuous Professional Development Program of PEC, March 29, 2018
- Attended several workshops on "Outcome Based Education/Learning (OBE/OBL)" organized by PEC
- Delivered Invited Talks at Frontiers of Information Technology (FIT) Conferences in 2011 and 2012
- Participated in ABET Symposium held at St. Louis, Missouri, USA in April 2012
- Delivered a talk on "GSM to LTE: Evolution of Digital Mobile Cellular Networks" at a Seminar on "Advanced Topics in Computer Networks and Data Communication" at Sukkur Institute of Business Administration, Airport Road, Sukkur, 65200, Pakistan, June 4-6, 2010.

HONORS & AWARDS

Erasmus Mundus Mobility Grant, Sehir University, Istanbul, Turkey	2019
Annual Research Productivity Awards, CUI, Islamabad, Pakistan	2012 – 2017
Erasmus Mundus Mobility Grant, LBUS, Sibiu, Romania	2012
Member, CUI Delegation to UiUC nad NDSU, USA	2012
Member, CUI Delegation to Malaysia, Kuala Lumpur, Malaysia	2009
Program Evaluator (PEV) for Accreditation of Engineering Programs	2008-2023
Member, National Curriculum Review Committees (NCRC), Higher Education Commission (HEC), Pakistan	2008-2014
Member, Pakistan Delegation to "Hannover Messe", Hanover, Germany	2008
Post-Doctoral Fellowship, Ryerson University, Toronto, Ontario, Canada	2003 – 2004
Ph.D. Scholarship, INT (TelecomSudParis), Evry, France	1999 – 2002

- Science and Technology (S&T) Scholarship for Graduate Studies
  Ministry of Science and Technology, Pakistan   1996 – 2001
- Member, Pakistan Engineering Council, Islamabad, Pakistan   1991
- Merit Scholarship for Undergraduate Studies, FBISE, Islamabad, Pakistan   1985 – 1990

LANGUAGES AND COMPUTING SKILLS

- Fluent English, Urdu and Punjabi; Working French
- Programming Languages: C/C++, Java, Assembly (x86, 68K), Scripting (Shell, Python, PERL, TCL/TK)
- Tools: MATLAB, GNU Radio/USRP, OPNET, ns-3, OMNeT++, WireShark, Packet Tracer

RESEARCH WORK DETAILS

Patents and Funded Projects:

- **Patents:** "System and Method for Uninterrupted Communication Across Black Spots for Multi Interface Mobile Nodes", R. Hussain, S. A. Malik, S. A. Khan, (US Patent 9629055B2; April 18, 2017)
- **Funded Project:** "Design and Development of Efficient Techniques for Optimal Radio Spectrum and Mobility in Cognitive radio (CR) based 5G communication Systems, NRPU, HEC, Pakistan (PKR 1525970.0, February 2019 – January 2022, Completed)
- **Funded Project:** "Real-Time Fast Image Reconstruction of pMRI algorithms by GPU based parallel computation", Higher Education Commission (HEC), Sept. 2018 – Aug. 2019 (PKR 478000.0,Completed)
- **Funded Project:** "End-to-End Mobility Management Framework (EMF)", National ICT R&D Fund Project, Pakistan, September 2008 – August 2011 (Completed – September 2011)

Research Supervision:

Supervised the completion of eight PhD theses, twenty four MS theses and more than thirty five senior design projects

- *PhD Theses:*

  1. Analysis and Optimization of Shared Spectrum Access in 5G (Waseem, 2023, Co-supervised with Dr. Riaz Hussain)
  2. Design and Analysis of D2D Communication Mechanisms in 5G Cellular Networks (Adeel Iqbal, 2022, Co-supervised with Dr. Riaz Hussain)
  3. Energy Efficient Resource Management Techniques for Cognitive Radio Networks (Shakeel Alvi, 2021)
  4. Design and Analysis of Spectrum Handoff Techniques in Cognitive Radio Networks (Atif Shakeel, 2020);
  5. Evaluation and Enhancement of MAC Protocols for Efficient Spectrum Management and Sharing in Cognitive Radio Networks (Irfan Latif, 2018);
  6. Advanced Methods for Image Reconstruction in Magnetic Resonance Imaging (Omair Inam, 2018, Co-supervised with Dr. Hammad Omer);
  7. Robust Control System Design for a Class of Uncertain Nonlinear Systems (Mahmood Pervez, 2014, Co-supervised with Dr. Amir Iqbal Bhatti);
  8. Modeling, Analysis and Optimization of Vertical Handover Schemes in Heterogeneous Wireless Networks (Riaz Hussain, 2013)

- *MS Theses*:

  Mobile Wireless Networks

  1. Group Key Management in D2D Group Communication (Anique Ahmad, 2018); 2. Secure Device-to-Device Communication in 5G Wireless Systems (Amir Aziz Butt, 2017); 3. Performance Analysis of Scheduling Techniques for Multimedia Applications in LTE Networks (M. Attique Atta, 2016); 4. Performance Analysis of Multimedia Services over LTE (M. Azeem Akram, 2015); 5. Robust

Controller Design for a Nonlinear System (Umair Ashraf, 2015); 6. Transport protocols for Video Transport in Mobile WiMax (M. Omar Chughtai, 2010); 7. Performance Analysis of SCTP and DCCP for Video Transport over Heterogeneous Network (Yousaf Bin Zikriya, 2007); 8. Performance Evaluation of DCCP and SCTP for MPEG4 over Wireless Networks (Sumera Nosheen, 2007); 9. Comparison of Energy Efficient MAC Protocols for Wireless Sensor Networks (Muhammad Asif, 2007); 10. Seamless Handoff Performance and Analysis in Mobile IP (Nauman Munir Afzal, 2006); 11. QoS and performance in IEEE802.11 WLANs (Ammar Abbas, 2005)

Renewable Energy Systems (In collaboration with Several Colleagues)

1. Energy Management for a Grid-Connected PV-Battery System (Ahsan Ali Tahir, 2023); 2. Predictive Economic Dispatch in the Presence of Renewable Energy Sources (Rizwanullah, 2022); 3. Modeling and Analysis of Photovoltaic Systems in Pakistan (Muhammad Haseeb, 2022); 4. Energy Management in Smart Grid for Improving Power Quality (Ilyas Ahmad, 2022); 5. Observer Based Finite Time Sliding Mode Nonlinear Control Strategies for Hybrid Energy Storage System in Electric Vehicles (Sana Khan, 2022); 6. Analysis of Higher-order Sliding Mode Control for MPPT in Grid Connected Solar PV System (Laiba Ashiq, 2021); 7. Capacity Optimization of Renewable Hybrid System Using Advance Intelligence Techniques (Muhamamd Aaliyan Javaid, 2021); 8. Performance Analysis and maximizing Efficiency of Wireless Power Technologies (Umer Zubair, 2021); 9.Smoothing of Wind and Photovoltaic Power Generation Fluctuations Using Storage Devices (Samiullah Khan, 2021); 10. Voltage Stability in Electrical Power System with Energy Storage (Hafiz Muhammad Naeem, 2021); 11. Voltage Profile Improvement by Integrating Renewable Resources with Utility Grid (M. Bilal Ali, 2020); 12. Power Management of AC/DC Micro grid for Hybrid Energy System Integrating Renewable Sources and Storage (Murriah Shafiq, 2020); 13. Analysis of MPPT techniques for a PV system under various weather conditions (M. Usman Riaz, 2020); 14. Design of an Efficient Cascaded Multilevel Inverter (Nayyar Ijaz, 2019)

- ***Undergraduate Senior Design Projects:*** Thirty plus senior design projects (70+ students) on mobile wireless systems, digital communication, software defined radio (SDR), IoT and embedded systems

2. Projects Completed as part of Post-Doctoral and PhD research work
- Developed a Wireless Bandwidth Management (WBM) framework to improve throughput performance and fairness of transport connections in IEEE802.11 WLANs
- Designed, developed and validated a system level dynamic event driven simulator for a 3G UMTS WCDMA Radio Access Network (RAN) using OPNET Modeller and C; Implemented RLC/MAC layer protocol procedures, power control, radio resource allocation mechanisms (CAC and Scheduling), mobility management, macro-diversity, soft-handover (SHO) along with micro/macro cellular network topologies and multimedia traffic generation
- Developed software modules in OPNET Modeller for GPRS RLC/MAC and LLC layer protocols procedures in Nortel Networks future generation mobile network testbed (GPRS Simulator); Integrated, tested and validated the code with other protocol modules developed in house by Nortel

PUBLICATIONS

Journal Publications (2011 Onwards)

1. Waseem Abbass, Riaz Hussain, Nasim Abbass, Shahzad A. Malik, Muhammad Awais Javed, Muhammad Khan, Rayan Hamza Alsisi, Abdulfattah Noorwali and Priyadarshini A. Pattanaik, **"Channel Allocation to GAA Users using Double Deep Recurrent Q-Learning Based on Double Auction Method"** IEEE Access, October 2023. [JCR Impact Factor: 3.557 (2022)]
2. Waseem Abbass, Riaz Hussain, Jaroslav Frnda, Irfan Latif Khan, Muhammad Awais Javed and Shahzad A. Malik, **"Optimal Resource Allocation for GAA Users in Spectrum Access System Using Q-Learning Algorithm"**, IEEE Access, June 8, 2022. [JCR Impact Factor: 3.476 (2021)]

3. Waseem Abbas, Riaz Hussain, Jaroslav Frnda, Naeem Abbas, Muhammad Awais Javed and Shahzad A. Malik, "**Resource Allocation in Spectrum Access System Using Multi-Objective Optimization Methods**", Sensors Journal, August 2021. ISSN 1424-8220, https://doi.org/10.3390/s22041318 [JCR IF: 3.031 (2020)]

4. Adeel Iqbal, Muddasir Rahim, Riaz Hussain, Abdulfattah Noorwali, Mohammad Zubair Khan, Atif Shakeel, Irfan Latif Khan, Muhammad Awais Javed, Qadeer ul Hasan, and Shahzad A. Malik, "**cDERSA: Cognitive D2D Enabled Relay Selection Algorithm to Mitigate Blind-Spots and Ensure Privacy in 5G Cellular Networks**", IEEE Access, June 2021; [JCR Impact Factor: 3.754 (2020)]

5. Rahim, M., Hussain, R., Khan, I. L., Alvi, A. N., Javed, M. A., Shakeel, A., and Malik, S. A. (2021), "**Self-Organized Efficient Spectrum Management through Parallel Sensing in Cognitive Radio Network**", "Wireless Communications and Mobile Computing, 2021" [JCR Impact Factor: 2.336 (2020)]

6. Shakeel A. Alvi, Riaz Hussain, Atif Shakeel, Muhammad Awais Javed, Qadeer Ul Hasan, Byung Moo Lee, and Shahzad A. Malik, "**QoS-Oriented Optimal Relay Selection in Cognitive Radio Networks**", Wireless Communications and Mobile Computing, Vol. 2021, Article-ID: 5580963, April 24,2021. https://doi.org/10.1155/2021/5580963 [JCR Impact Factor: 2.336 (2020)]

7. Adeel Iqbal, Riaz Hussain, Atif Shakeel, Irfan Latif Khan, Muhammad Awais Javed, Qadeer ul Hasan, Byung Moo Lee, and Shahzad A. Malik, "**Enhanced Spectrum Access for QoS Provisioning in Multi-Class Cognitive D2D Communication System**", IEEE Access, March 2021. DOI: 10.1109/ACCESS.2021.3060961; [JCR Impact Factor: 3.754 (2020)]

8. Muddasir Rahim, Ahmed S. Alfakeeh, Riaz Hussain, Muhammad Awais Javed, Atif Shakeel, Qadeer ul Hasan, Adeel Israr, Alhuseen Omar Alsayed and Shahzad A. Malik, "**Efficient Channel Allocation using Matching Theory for QoS Provisioning in Cognitive Radio Networks**", Sensors Journal, March 27, 2020. (ISSN 1424-8220) [IF: 3.031 (2019)]

9. Atif Shakeel, Riaz Hussain, Adeel Iqbal, Irfan Latif Khan, Qadeer Ul Hasan and Shahzad A. Malik, "**Spectrum Handoff based on Imperfect Channel State Prediction Probabilities with Collision Reduction in Cognitive Radio Ad Hoc Networks**", Sensors Journal, October 31, 2019. (ISSN 1424-8220) [IF: 3.031 (2018)]

10. Atif Shakeel, Riaz Hussain, Adeel Iqbal, Irfan Latif Khan, Qadeer ul Hasan and Shahzad Ali Malik, "**Analysis of Efficient Spectrum Handoff in a Multi-Class Hybrid Spectrum Access Cognitive Radio Network Using Markov Modelling**", Sensors Journal, MDPI, September 23, 2019. (ISSN 1424-8220) [IF: 3.031 (2018)]

11. Shakeel A. Alvi, Riaz Hussain, Qadeer Ul Hasan and Shahzad A. Malik, "**Improved Buffer-Aided Multi-Hop Relaying with Reduced Outage and Packet Delay in Cognitive Radio Networks**", Electronics Journal, MDPI, August 14, 2019. (ISSN 2079-9292) [IF: 2.1 (2018)]

12. Bilal Hussain, Asif Khan, Nadeem Javaid, Qadeer Ul Hasan, Shahzad A. Malik, Omer Ahmed, Amir Hanif Dar and Ahmad Kazmi, "**A Weighted-Sum PSO Algorithm for HEMS: A New Approach for the Design and Diversified Performance Analysis**", Electronics, MDPI Journal, February 04, 2019. (ISSN 2079-9292) [IF: 2.1 (2018)]

13. Babatunji Omoniwa, Riaz Hussain, Muhammad Awais Javed, Safdar Hussain Bouk and Shahzad A. Malik "**Fog/Edge Computing-Based IoT (FECIoT): Architecture, Applications, and Research Issues**", IEEE INTERNET OF THINGS Journal, November 2018. DOI: 10.1109/JIOT.2018.2875544 [Impact Factor: 5.863 (2017)]

14. Babatunji Omoniwa, Riaz Hussain, Muhammad Adil, Atif Shakeel, Ahmed Kamal Tahir, Qadeer Ul Hasan, and Shahzad A. Malik, "**An Optimal Relay Scheme for Outage Minimization in Fog-Based Internet-of-Things (IoT) Networks**", IEEE INTERNET OF THINGS Journal, November 2018. DOI: 10.1109/JIOT.2018.2878609 [Impact Factor: 5.863 (2017)]

15. Bilal Hussain, Nadeem Javaid, Qadeer Ul Hasan, Sakeena Javaid, Asif Khan and Shahzad A. Malik, "**An Inventive Method for Eco-Efficient Operation of Home Energy Management Systems**", Energies, MDPI Journal, November 2018. 2878609 [Impact Factor: 2.676 (2017)]

16. Babatunji Omoniwa, Riaz Hussain, Adeel Iqbal, Qadeer Hasan; Junaid Ahmed, Ahmed Murkaz and Shahzad A. Malik, "**A Novel Model for Minimizing Unnecessary Handover in Heterogeneous Networks**", Turkish Journal of Electrical Engineering and Computer Science, May 2018. [Impact Factor: 0.580 (2017)]

17. Irfan Latif; Riaz Hussain; Atif Shakeel; Adeel Iqbal; Junaid Ahmed; Shakeel Alvi; Qadeer ul Hasan, Shahzad A. Malik, "**Efficient Idle Channel Discovery Mechanism through Cooperative Parallel Sensing in Cognitive Radio Network**", EURASIP Journal on Wireless Communications and Networking, April 2018. [Impact Factor: 1.52 (2016)]

18. Irfan Latif, Riaz Hussain, Adeel Iqbal, Qadeer Ul Hasan, Shahzad A. Malik, "**Design and Evaluation of Self Organizing, Collision Free MAC Protocol for Distributed Cognitive Radio Networks**", Wireless Personal Communications, Springer Journal, December 28, 2017. [Impact Factor: 0.951 (2016)]

19. Omair Inam, Mahmood Qureshi, Shahzad A. Malik and Hammad Omer, **"Iterative schemes to solve low-dimensional calibration equations in Parallel MR Image Reconstruction with GRAPPA"**, BioMed Research International, Hindawi Journal, September 2017. [Impact Factor: 2.476 (2016)]

20. Omair Inam, Mahmood Qureshi, Shahzad A. Malik and Hammad Omer, **"GPU-Accelerated Self-Calibrating GRAPPA Operator Gridding for Rapid Reconstruction of non-Cartesian MRI Data"**, Applied Magnetic Resonance, Springer Journal, September 2017. [Impact Factor: 0.864 (2016)]

21. Muhammad Hamayun Qammar Kayani, Kainat Naeem Malik, Shaban Ahmad, Ali Khaqan, SanaShuja, Qadeer-ul-Hasan, Shahzad A. Malik and Raja Ali Riaz, "**A Switching Based PID Technique for Blood Glucose Control**", Biomedical Research, 28:7230-7236, August 2017. [Impact Factor: 0.219 (2016)]

22. Zuwwar Jadoon, Sobia Shakeel, Abeera Saleem, Ali Khaqan, Qadeer Hasan, Shahzad A. Malik and Raja Ali Riaz, **"A Comparative Analysis Of PID, Lead, Lag, Lead-Lag and Cascaded Lead Controller For a Drug Infusion System"**, Journal of Healthcare Engineering, August 2017. [Impact Factor: 0.965 (2016)]

23. Faizul Hassan, Muhammad Ali, Ali Khaqan, Sana Shuja, Moazzam Islam Tiwana, Qadeer ul Hasan, Shahzad A. Malik, and Raja Ali Riaz, **"Closed Loop Blood Glucose Control in Diabetics"**, Biomedical Research, August 2017. [Impact Factor: 0.219 (2016)]

24. Ali Khaqan, Qadeer ul Hasan, Shahzad Malik, Muhammad Bilal , MFU Butt, Raja Ali Riaz, "**Comparison of Two Non-Linear Control Strategies for Hypnosis Regulation**" Arabian Journal of Science and Engineering, DOI 10.1007/s13369-017-2610-3, 2016. [Impact Factor: 0.865 (2016)]

25. Mahmood Pervaiz, Qudrat Khan, Aamer Iqbal Bhatti and Shahzad A. Malik, "**Dynamical Adaptive Integral Sliding Backstepping Control of Nonlinear Nontriangular Uncertain Systems**," Mathematical Problems in Engineering, Hindawi Journal, ISSN: 1026-0226, vol. 2014, Article ID 492824, 14 pages, 2014. [Impact Factor: 0.762 (2014)]

26. Farmanullah Jan, Imran Usman, Shahid A. Khan, and Shahzad A. Malik, "**A Dynamic Non-Circular Iris Localization Technique for Non Ideal Data**", Computers and Electrical Engineering, Elsevier Journal, ISSN: 0045-7906, June 2014. [Impact Factor: 0.928 (2013)]

27. Mahmood Pervaiz, Qudrat Khan, Aamer Iqbal Bhatti and Shahzad A. Malik, "**Output Tracking via Adaptive Backstepping Higher Order Integral Sliding Mode for Uncertain Nonlinear Systems**", Discrete Dynamics in Nature and Society, Hindawi Journal, ISSN: 1026-0226, March 2014. [Impact Factor: 0.820 (2013)]

28. Farmanullah Jan, Imran Usman, Shahid Ahmad Khan and Shahzad A. Malik, "**Iris Localization Based on the Hough Transform, a Radial-Gradient Operator, and the Gray-Level Intensity**", OPTIK - International Journal for Light and Electron Optic, ISSN: 0030-4026,, Vol. 124, Issue 23, 5976-5985, December 2013. [Impact Factor: 0.524 (2012)]

29. K.S.Alimgeer, Shahid A. Khan, Shahzad A. Malik, "**Improved Q -Factor Calculations for Single Port Filter-Antenna Measurement", Wireless Personal Communications**, Springer Journal, ISSN: 0929-6212, Vol. 72, Issue 2, pp. 1351-1359, July 2013. [Impact Factor: 0.428 (2012)]

30. Riaz Hussain, Shahzad A. Malik, Shafayat Abrar, Raja A. Riaz, Hassan Ahmed and Shahid A. Khan, "**Vertical Handover Necessity Estimation Based on a New Dwell Time Prediction Model for Minimizing Unnecessary Handovers to a WLAN Cell**", Wireless Personal Communications, Springer Journal, ISSN: 0929-6212, Vol. 71, Issue 2, pp. 1217-1230, July 2013. [Impact Factor: 0.428 (2012)]

31. Shahrukh Agha, Shahid Ahmed Khan, Shahzad A. Malik, "**Reduced Bit Low Power VLSI Architectures for Motion Estimation**", Journal of Systems Engineering and Electronics, ISSN: 1004-4132, Vol. 24, Issue 3, pp. 382-399, July 2013. [Impact Factor: 0.38 (2012)].

32. Rana Liaqat Ali Shahid A. Khan, Anum Ali, Anis-ur-Rehman, Shahzad A. Malik, "**A Robust Least Mean Square Algorithm for Adaptive Array Signal Processing**", Wireless Personal Communication, Springer Journal, ISSN: 0929-6212, Vol. 68, Issue 4, pp. 1449-1469, February 2013. [Impact Factor: 0.428 (2012)]

33. Riaz Hussain, Shahzad A. Malik, Shahid A. Khan, Shafayat Abrar, "**Design, Implementation and Experimental Evaluation of an End-to-End Vertical Handover Scheme on NCTUns Simulator**", Elsevier Journal of Simulation Modelling Practice and Theory, ISSN: 1569-190X, Volume 26, pp. 151-167, August 2012. [Impact Factor: 1.159 (2011)]

34. Muhammad Yousaf, Amir Qayyum, Shahzad A. Malik, **"An Architecture for Exploiting Multihoming in Mobile Devices for Vertical Handovers and Bandwidth Aggregation"**, Springer Wireless Personal Communications Journal, ISSN: 0929-6212, Vol. 66, Issue 1, pp. 57-79, September 2012. [Impact Factor: 0.458 (2011)]

35. Riaz Hussain, Shahzad A. Malik, Raja A. Riaz, Saeed Ahmed, Ghuffran Shafique, Adeel Iqbal, Shafayat Abrar, and Shahid A. Khan, "**A Host Based Autonomous Scheme for Seamless Vertical Handover**", Electrical Review (PRZEGLD ELEKTROTECHNICZNY) Journal, ISSN: 0033-2097, Vol. 88, No. 9b, pp. 314-318, September 2012. [Impact Factor: 0.244 (2011)]

36. Riaz Hussain, Shahzad A. Malik, Shafayat Abrar, Raja Ali Riaz and Shahid A. Khan, "**Minimizing Unnecessary Handovers in a Heterogeneous Network Environment**", Electrical Review (PRZEGLD ELEKTROTECHNICZNY) Journal, ISSN: 0033-2097, Vol. 88, Issue 6, Pages 300-303, June 2012. [Impact Factor: 0.244(2011)]

37. Safdar Ali, Shahzad A. Malik, K. S. Alamgir, Shahid A. Khan, Rana Liaquat Ali, "**Statistical Estimation of Tropospheric Radio Refractivity Derived from Ten Years Meteorological Data**", Elsevier Journal of Atmospheric and Solar-Terrestrial Physics (ATP), ISSN 1346-6826, Vol. 77, pp. 96-103, March 2012. [Impact Factor = 1.579 (2011)]

38. Shafayat Abrar, Riaz Hussain, Raja A. Riaz, Shahzad A. Malik, Shahid A. Khan, Ghufran Shafiq, Saeed Ahmed, "**A New Method for Handover Triggering Condition Estimation**", IEICE Electronics Express (ELEX) Journal, ISSN: 1349-2543, Vol. 9, No. 5, pp. 378–384, March 2012. [Impact Factor: 0.461 (2011)]

39. Muhammad Siddiqi, Muhammad Bhatti, Sana Shuja, Shaista Jabeen, Saeed Ahmad, Adeel Iqbal, Ghufran Shafiq, Ahmad Alvi, Azhar Yaseen, Abid Minhas, Shahzad A. Malik, Shahid Khan, Raja Riaz, "**ASIC Design Implementation of Memory Efficient Infinite Impulse Response UWB Equalizer**", Electrical Review (PRZEGLD ELEKTROTECHNICZNY) Journal, ISSN: 0033-2097, Volume 88, No. 3b, pp. 223-227, 2012. [Impact Factor: 0.244 (2011)]

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