Prof. Dr. Muhammad Fasih Uddin Butt

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Personal Statement	An innovative and experienced researcher with a proven track record of prestigious peer reviewed journals (28 impact factor and 2 ISI indexed) and 23 conference publications, and the ability to attract research funding. I did PhD in Electrical and Electronics Engineering with specialization in Wireless Communication Systems from the University of Southampton. I have taught Electrical Engineering courses related to communication and signal processing to both undergraduate and postgraduate students. I have successfully supervised 5 PhD and 21 MSc students in the field of Telecommunications Engineering. Some of my active research areas include internet of things (IoT), radio over fiber technologies, physical layer security, channel coding, cooperative cognitive radio networks and efficient hardware implementation of high throughput MAP decoders on FPGAs. In addition, I have supervised numerous undergraduate design projects in which the students successfully converted their ideas to prototypes using digital electronic circuits and won prizes in international and local competitions. Recently, I worked with the University of Southampton as a postdoctoral researcher in the area of machine learning for massive IoTs focusing on smart cities applications.
Academic Qualifications	**Postdoctoral Researcher** *Dec 2020 till Nov 2021* *Next Generation Wireless Research Group,* *School of Electronics and Computer Science,* *University of Southampton, United Kingdom* ***Project Title:*** Machine Learning for Massive Internet of Things ***Detail of Duties:*** I designed low-complexity machine learning techniques for efficient resource management of future massive IoT networks focusing on smart cities applications. Analysis was carried out to meet various user demands such as quality of service, highly dynamic machine-type communication (MTC) traffic, huge signaling overhead and security. This way connectivity of massive MTC devices transmitting short packets reliably at low power over a broad geographical area is achieved. **PhD in Electronics and Electrical Engineering** *5th October 2006 to 25th June 2010* *Communications Research Group,* *School of Electronics and Computer Science,* *University of Southampton, United Kingdom* ▪ ***Thesis Title:*** Self-Concatenated Coding for Wireless Communication Systems ▪ ***Achievements:*** The work resulted in 6 impact factor journals including 3 IEEE Transactions and 9 IEEE conference publications **M.Sc. in Computer Engineering** *2001-2003* *University of Engineering and Technology Taxila, Pakistan* ▪ ***Area of specialization:*** Digital Communications/Computer Networks ▪ ***Modules of interest:*** Advanced Digital Design, Advanced Digital Signal Processing, Digital Communications and Mobile Communications **BEng in Mechanical Engineering** *1996-1999* *National University of Sciences and Technology,* *Rawalpindi, Pakistan* ▪ ***Design project:*** Designed and simulated an Aging Furnace using ANSYS Software

Research Interests	▪ Machine Learning for Massive Internet of Things for Beyond 5G Communications ▪ Radio over Fiber Technologies ▪ Physical Layer Security ▪ Channel Coding and Hardware Implementation of High Throughput MAP Decoders ▪ Cooperative Cognitive Radio Networks ▪ Applications of Frequency Selective Surfaces in Wireless Communications ▪ Signal Processing Techniques for Alternate Energy ▪ Sustainable Farming Techniques – Aquaponics

Career History	**Tenured Professor**
	Nov 2002 till date *Department of Electrical & Computer Engineering (ECE), COMSATS University Islamabad (CUI), Islamabad Campus, Pakistan*
	
	During my service at CUI, I engaged in research, teaching and enterprise. I also performed management and administration duties. These are detailed below:
	
	➢ **Research Activities:**
	I am a seasoned researcher with 28 impact factor journal papers (total impact factor of 69.464), 2 ISI indexed journal papers and 23 conference publications. A number of manuscripts are under review and preparation. A full list is available on pages 5-8.
	Google Scholar Citations: 540, h-index: 13, i10-index: 18
	https://scholar.google.com/citations?user=aWilRTMAAAAJ&hl=en&authuser=1&oi=ao
	
	1.1 Funded Projects:
	▪ **PI** in project titled**, "Monitoring of student's attention in a classroom using AI Computer Vision" ELM Research, Saudi Arabia:** *$5500* (Awarded in 2022, in progress)
	▪ **Co-PI** in project titled**, "RF/MW Transmission Improvement in Energy efficient buildings using Frequency Selective Surfaces"** by **Institutional Fund for Research and Development, King Abdulaziz University, Jeddah, Saudi Arabia:** *SAR 28k* (Completed in 2023)
	▪ **Co-PI** in project titled, **"Development of a Wind Power Forecasting System in Pakistan"** by **HEC NRPU:** *PKR 2 million* (Completed in 2020)
	▪ **Co-PI in** in project titled, **"Implementation of Hardware Efficient QC-LDPC codes for DVB-S2 over SDRs"** by **NESCOM project:** *PKR 0.3 million* (Completed in 2023)
	▪ **PI in Pakistan National Student Satellite Program Projects:** *PKR 0.78 million* (combined) (Both completed in 2019)
	    ○ Design and Development of Earth Horizon Sensing Module for LEO Satellite
	    ○ Development of Secure and Reliable Communication System for LEO Satellite
	▪ **PI in National Grassroots ICT Research Initiative Projects:** *PKR 300k* (combined)
	    ○ Posture Rehabilitation with integrated Feedback Loop (completed in 2019)
	    ○ Development of a low-cost Aquaponics food production system (completed in 2016)
	    ○ Design and Implementation of a Multipurpose Real Time Digital Clock (completed in 2016)
	    ○ Power Generation through Heliostats (completed in 2015)
	
	1.2 Awards Won:
	▪ Awarded HEC's Post-doctoral Fellowship 2020-2021 for Postdoctoral studies at the University of Southampton, UK. Award: *GBP 22k*
	▪ Awarded scholarship to pursue PhD studies at the University of Southampton, UK from 2006-2010 by COMSATS University Islamabad's Faculty Development Program. Award: *GBP 75k*
	▪ Awarded by COMSATS University Islamabad with funds to visit the University of Southampton, UK for enhancing research collaboration (July 2016). Award: *PKR 325k*
	▪ Awarded 'Research Productivity Awards' for year 2012 and 2017. Award: *PKR 20k (combined)*
	▪ Awarded honorarium for 3 consecutive years from 2013-2015. Amount: *PKR 100k* (combined)
	▪ Awarded by Turkish Government's Mevlana Exchange Programme for a 2 weeks academic visit to Düzce University, Turkey in November 2014.
	▪ Supervised project "Security Monitoring via Surveillance Robot" which won 1st position in COMSATS Engineering Projects Exhibition (CEPEX) 2017 in Electronics category.
	▪ Supervised project "Development of a Low Cost Aquaponics System using NI-myRIO" which won 2nd position in National Instruments International GSD Musabaka Contest held in Beirut, Lebanon on 6th May 2016.

1.3 Presentations:

I presented papers in following prestigious conference proceedings: IEEE ICC 2009 in Dresden, Germany; ISAP 2015 in Hobart, Australia; IEEE WCNC 2017 in San Francisco, CA, USA; APS-URSI 2017 in San Diego, CA, USA; 29th IEEE PIMRC 2018 in Bologna, Italy and 13th ICSPCS' 2019, Surfers Paradise, Gold Coast, Australia.

1.4 Invited talks:

- Keynote speaker at National C & IT Symposium, NUST, Islamabad, Pakistan in July 2013. The topic of my presentation was "Self-concatenated code design and its application in Power-efficient communications".
- Invited speaker at Frontiers of Information Technology conference, Islamabad, Pakistan in December 2013. The topic of my presentation was "Distributed channel coding for cooperative communications".
- Invited speaker at a 5G seminar held in Institute of Space Technology, Islamabad, Pakistan on 16th October 2015. The topic of my presentation was "Cooperative Distributed Matching Algorithms for Spectrum Access in 5G Communications".
- During a week-long academic visit to National Academy of Sciences of Belarus, Minsk, Belarus, 6th October 2015, I presented my ideas on the topic of "Opportunities for Research in 5G Communications".
- I presented my research work in the National Instruments NIDays, Beirut, Lebanon, 6th May 2016. The title of my presentation was "Paving the way to 5G".
- Invited speaker, at the Department of Mathematics, COMSATS University Islamabad on the topic of "Modern Engineering Applications of Mathematics" to celebrate the International Day of Mathematics on 14th March 2022.

1.5 Establishment of Research Labs and Research Collaborations:

- I am the Founder and Head of Next-Generation Communications Research Group (Spring 2016 till date). The group works on Universal Software Radio Peripheral (USRP) kits to design and test next generation communication algorithms.
- I was the Founder and Head of Modeling and Simulation Lab (Spring 2012-Spring 2017). The lab was established to facilitate postgraduate students in their research work. I made a cluster of 28 PCs to run parallel simulations on each computer.
- Arranged funding to support 2 two-week visits of Dr. Soon Xin Ng (Michael), University of Southampton, UK on Visiting Foreign Faculty Program of HEC for enhancing research collaboration (16th-27th March 2015 & 17th-28th December 2018). Workshops on Quantum Communications, Distributed Coding for Cooperative Communications, Cognitive Radio and Hierarchical Modulation.
- Arranged funding to support a two-week visit of Dr. Raziq Yaqub, Director Technical Training, NIKSUN, Princeton, New Jersey, USA under President's program for care of highly Qualified overseas Pakistanis (11th-22nd May 2015). Workshops on "Smart Grids" and "LTE and Beyond" were conducted.

➢ **Teaching Activities:**

2.1 Module Leader

I have taught several courses related to communication and signal processing to both undergraduate and postgraduate students. The details are:

- *Undergraduate courses (Average Students' Feedback: 80%):* I taught courses of Analog Communication Systems, Digital Communication Systems, Principles of Communication Systems, Signals and Systems, Digital Signal Processing and Digital Logic Design.
- *Postgraduate courses:* I taught courses of Digital Communications, Wireless Communication Techniques, Advanced Digital Design, Advanced DSP, Advanced Topics in Communication System Engineering, Advanced Topics in Communication Signal Processing, Advanced Topics in Information Theory and Coding.
- I developed the course handbooks of Analog Communication Systems and Digital Signal Processing according to the Outcome Based Education (OBE).
- I have experience of MATLAB/Simulink and LabVIEW software. I have developed and conducted labs for Digital Logic Design, Signals and Systems, Digital Signal Processing and Analog Communication Systems courses. I was the pioneer in introducing LabVIEW software and USRPs in communication courses.

2.2 Undergraduate Design Projects Supervision:

I have supervised around 40 undergraduate design projects of Electrical Engineering students. A couple of these projects won positions in competitions. During the supervision of these projects my focus has always been to enable students to solve complex engineering problems and to address the societal issues. For example, the project "Development of a Low Cost Aquaponics System using NI-myRIO" won many accolades during its

presentation in National Instrument's Contest held in Beirut due to several benefits offered by Aquaponics such as year-round production of fish and leafy greens, water conservation, having no harmful byproducts and production of organic food free from pesticides.

2.3 PhD Thesis Supervision: 5 completed
- S. Habib, Applications of Frequency Selective Surfaces in Wireless Communication (2021)
- S. Iqbal, On Performance Analysis of Optical Transmission Schemes for Next-Generation Communications Networks (2021)
- F. Shaheen, Performance Analysis of High Throughput MAP Decoder (2020)
- A. Raza, Millimeter-wave Radio-over-Fiber Transmission Schemes for the Next Generation Wireless Access Networks (2019)
- B. Ali, Resource Allocation in Cooperative Cognitive Radio Networks (2017)

2.4 MS Thesis Supervision: 21 completed

2.5 Academic Services in the Department:

As member of the following committees, I ensured that the curriculum is designed according to the highest standards: Member Departmental Academic Review Committee (2016-2020); Member Graduate Advisory Committee (2012-till now); Technical Head Communication & Signal Processing, Project Management Committee (2010-2020); Invited Member Board of Studies (2013-2016); Steering Committee Member for Teaching Quality Assurance (2010-2012) and Group Head of Signal Processing TQA Committee (2010-2012).

➢ **Management and Administrative Roles:**

I worked with teaching staff and services in the University (for example, Student Services, Admissions, Career Development Cell) to ensure that a comprehensive support is provided to both undergraduate and graduate students during my following two roles:
- Associate HoD – Electrical Engineering (February 2013-July 2016)
- Senior Incharge – Graduate Program (Fall 2012-Spring 2014)

I regularly met with students and staff to assess and ensure the quality of students' learning experience.

3.1 Services in the University:

As member of the following committees, I ensured that merit is kept in mind and rules and regulations are followed while making decisions: Member/Secretary Departmental Tenure Review Committee (Sept 2019-till date); Member Graduate Advisory Committee (2012-till date) Member Central Purchase Committee (June 2019-Nov 2020) and Member Health Insurance Review Committee (June 2019-till date).

3.2 Personal Tutor:

I meet tutees regularly to discuss their progress and any potential issues to be resolved and provided them references for their internships and job applications.

3.3 Arranging Induction Activities in the University:

I worked with Head of Department to arrange the induction week for undergraduate and graduate students.

Backup Administrator

August 2008 to January 2010   *Communications Research Group,*
University of Southampton

The work involved generating backups of the Communication Research Group's data and then transferring the backup to remote locations. To resolve any issues related to loss of data, backup generation problems and to configure and maintain user logins in the network.

Learning Support Assistant

October 2007 to July 2010   *Mentor Services, Ancillary Learning Support,*
University of Southampton

Trained to deal with different situations while working for students with learning difficulties and at the same time maintaining their confidentiality. Worked mostly with Physics students and took notes for them related to Electromagnetic Theory, Electronics, Mathematics, Mechanics and even Cosmology.

	Lab Demonstrator/Teaching Assistant *Spring 2010* *ELEC6021 Research Methods,* *MSc in Wireless Communications, University of Southampton* Conducted MATLAB based labs and assisted Prof. Rob Maunder in marking of lab and course assignments.
Trainings Attended/ Certifications Achieved	- Certification in Commercial Design of Aquaponics (1st Aug 2019) Taught by Murray Hallam of Practical Aquaponics, Queensland, Australia. - Introduction to Aquaponics (18th March 2017) and Aquaponic Farming Experience (14-17th July 2017) Ouroboros Farm, San Francisco, CA. - Program Evaluators (PEVs) trainings at PEC headquarters, Islamabad, Pakistan: Overview on Engineers Mobility, Accreditation and FEIAP Engineering Education Guidelines OBE System (16th Sept 2015), Assessment and Complex Engineering Problems (24th Sept 2016), Evidence-Based Onsite Assessment During Accreditation Visits for Program Evaluators (28th Aug 2016) and Outcome-Based Accreditation for Program Evaluators (8-9 Feb 2018). - LabVIEW Core 1 & Core 2 (25-29 July 2016) National Instruments, Islamabad - Smart Grids (11th-14th May 2015) and LTE and Beyond (18th-21st May 2015) PEC CPD courses, COMSATS Islamabad by Dr Raziq Yaqub, NIKSUN Inc., Princeton, NJ, USA - MIMO for Wireless Communications (26th Dec 2012) PEC CPD course, COMSATS Islamabad, Pakistan - Supporting students with epilepsy at university, Epilepsy Awareness Ltd, University of Southampton (April 2010) - Visual Impairment Awareness Workshop, Action for blind people, University of Southampton (3rd June 2009) - Real Time DSP (10th-14th Mar 2003) National University of Sciences and Technology, Pakistan - Faculty Development Program (April 2002) COMSATS University Islamabad, Pakistan - Verification using Vera (26th-27th Dec 2001) CASE, Islamabad, Pakistan
Research Publications	**Articles published in Impact Factor (IF) journals (Total IF: 69.464)** 1. G. I. Kiani, S. Habib, **M. F. U. Butt** and A. J. Aljohani, "RF/MW Transmission Improvement in Energy Efficient Buildings Using FSS and Its Impact on Thermal Efficiency of Energy-Saving Glass", *Journal of Electronic Materials,* 2023, DOI: 10.1007/s11664-023-10672-8 **(Impact Factor: 2.1)** 2. N. Zamir, B. Ali, **M. F. U. Butt**, M. A. Javed, B. M. Lee and S. X. Ng, "Cooperative Jamming-Assisted Untrusted Relaying Based on Game Theory for Next-Generation Communication Systems", *Applied Sciences*, Vol. 13, No. 13, 7863, 2023, DOI: 10.3390/app13137863 **(Impact Factor: 2.7)** 3. M. D. Sabir, **M. F. U. Butt**, A. Hassan, S. Rehman, M. Mehmood and A. J. Aljohani, "CoRAE: Energy Compaction-Based Correlation Pattern Recognition Training Using AutoEncoder", *IEEE Access*, vol. 11, pp. 28014-28033, 2023, DOI: 10.1109/ACCESS.2023.3253964 **(Impact Factor: 3.476)** 4. Z. Ali, K. N. Qureshi, A. S. Al-Shamayleh, A. Akhunzada, A. Raza and **M. F. U. Butt**, "Delay Optimization in LoRaWAN by Employing Adaptive Scheduling Algorithm With Unsupervised Learning," *IEEE Access*, vol. 11, pp. 2545-2556, 2023, DOI: 10.1109/ACCESS.2023.3234188 **(Impact Factor: 3.476)** 5. S. Ghafoor, S. Afraz, A. Raza, **M. F. U. Butt**, "Electroabsorption Modulator-Based Relay for the Transmission of DPSK-Modulated Signals over the Free Space Optical Link", *Arabian Journal for Science and Engineering*, vol. 48, pages 6163–6173, 2023, DOI: 10.1007/s13369-022-07277-4 **(Impact Factor: 2.807)** 6. S. Habib, G. I. Kiani, **M. F. U. Butt**, S. M. Abbas, A. J. Aljohani and S. X. Ng, "Ultra-wideband FSS for Communication Applications", *CMC-Computers, Materials & Continua,* Vol. 70, No. 3, 2022, pp. 6177-6187, DOI:10.32604/cmc.2022.021644 **(Impact Factor: 3.77)** 7. S. Iqbal, A. Raza, **M. F. U. Butt,** J. Mirza, M. Iqbal, S. Ghafoor and M. El-Hajjar, "Millimeter-wave enabled PAM-4 data transmission over hybrid FSO-MMPOF link for access networks", *Optical Review,* 25th April 2021, DOI: 0.1007/s10043-021-00659-3 **(IF: 1.068)** 8. S. Habib, A. Ali, G. I. Kiani, W. Ayub, S. M. Abbas, and **M. F. U. Butt**, "A low-profile FSS-based high capacity chipless RFID tag for sensing and encoding applications", *International Journal of Microwave and Wireless Technologies*, 25th March 2021, 1-9. DOI:10.1017/S1759078721000362 **(IF: 0.939)** 9. S. Iqbal, M. Iqbal, A. Raza, J. Mirza, S. Ghafoor, M. El-Hajjar and **M. F. U. Butt**, "Linearly polarized modes enabled PAM-4 data transmission over fewmode fiber for data center

interconnect", *Electronics Letters,* vol. 56, no. 21, pp. 1125 - 1127, 15th Oct 2020, DOI: 10.1049/el.2020.1848 **(IF: 1.316)**

10. S. Habib, G. I. Kiani and **M. F. U. Butt**, "Mobile Phone Signals Interference Cancellation With Improved WLAN Transmission and Thermal Insulation of Buildings Using FSS and RC Film," *IEEE Microwave and Wireless Components Letters*, vol. 30, no. 9, pp. 923–926, Sept 2020, DOI: 10.1109/LMWC.2020.3015697 **(IF: 2.31)**

11. N. Minallah, **M. F. U. Butt**, I. U. Khan, I. Ahmed, K. Khattak, G. Qiao and S. Liu, "Analysis of Near-Capacity Iterative Decoding Schemes for Wireless Communication Using EXIT Charts," *IEEE Access*, vol. 8, pp. 124424–124436, 30 June 2020, DOI: 10.1109/ACCESS.2020.3006024 **(IF: 3.475)**

12. S. Iqbal, A. Raza, **M. F. U. Butt**, S. Ghafoor and M. El-Hajjar, "A full-duplex radio over fiber architecture employing 12 Gbps 16 × 16 optical multiple input multiple output for next-generation communication networks", *Transactions on Emerging Telecommunications Technologies*, 1st March 2020, DOI: 10.1002/ett.3910 **(IF: 1.316)**

13. T. M. Khan, M. Mehmood, S. S Naqvi and **M. F. U. Butt**, "Unsupervised Optic Disc Detection Using Image De-hazing and Local Adaptive Thresholding", *PLoS ONE*, vol. 15, no. 1, 30th Jan 2020, DOI: 10.1371/journal.pone.0227566 **(IF: 2.776)**

14. F. Shaheen, **M. F. U. Butt**, S. Agha, S. X. Ng and R. G. Maunder, "Performance analysis of high throughput MAP decoder for turbo codes and self concatenated convolutional codes", *IEEE Access*, vol. 7, pp. 138079-138093, Sept. 2019, DOI: 10.1109/ACCESS.2019.2942152 **(IF: 4.098)**

15. S. Habib, G. I. Kiani and **M. F. U. Butt**, "A Convoluted Frequency Selective Surface for Wideband Communication Applications", *IEEE Access*, vol. 7, pp. 65075-65082, May 2019 **(IF: 4.098)**

16. B. Ali, N. Zamir, Soon Xin Ng and **M. F. U. Butt**, "Distributed Matching Algorithms for Spectrum Access: A Comparative Study and Further Enhancements", *KSII Transactions on Internet and Information Systems*, Vol. 12, No.4, April 30, 2018, DOI:10.3837/tiis.2018.04.011 **(IF: 0.561)**

17. A. Raza, K. Zhong, S. Ghafoor, S. Iqbal, M. Adeel, S. Habib, **M. F. U. Butt** and C. Lu, "SER Estimation Method for 56-GBaud PAM-4 Transmission System", Chinese Optics Letters, vol. 16, no. 4, pp 040604, 2018 **(IF: 1.851)**

18. A. Raza, S. A. Ghafoor and **M. F. U. Butt**, "MIMO Enabled Integrated MGDM-WDM Distributed Antenna System Architecture based on Plastic Optical Fibers for Millimeter-Wave Communication", Photonic Network Communications, vol. 35, no. 2, pp 265–273, April 2018, DOI: 10.1007/s11107-017-0741-9 **(IF: 0.793)**

19. B. Ali, N. Zamir, Soon Xin Ng and **M. F. U. Butt**, "Distributed Matching Algorithms: Maximizing Secrecy in the Presence of Untrusted Relay", *Radioengineering*, vol. 26, no. 2, June 2017 **(IF: 0.653)**

20. A. Khaqan, Q. Hassan, S. Malik, M. Bilal, **M. F. U. Butt** and R. A. Riaz, "Comparison of Two Non-Linear Control Strategies for Hypnosis Regulation", *Arabian Journal for Science and Engineering*, vol. 42, no. 12, pp 5165–5178, June 2017 **(IF: 0.367)**

21. M. Ilyas, **M. F. U. Butt**, M. Bilal, K. Mahmood, A. Khaqan and R. A. Riaz, "A Review of Modern Control Strategies for Clinical Evaluation of Propofol Anesthesia Administration Employing Hypnosis level Regulation", *BioMed Research International*, vol. 2017, Article ID 7432310, 30th March 2017, DOI: 10.1155/2017/7432310 **(IF: 1.579)**

22. S. Ahmed, A. Mahmood, A. Hasan, G. Sidhu and **M. F. U. Butt**, "A Comparative Review of China, India and Pakistan Renewable Energy Sectors and Sharing Opportunities", *Renewable and Sustainable Energy Reviews*, vol. 57, 2016, DOI: 10.1016/j.rser.2015.12.191 **(IF: 5.901)**

23. **M. F. U. Butt**, S. X. Ng and L. Hanzo, "Self-Concatenated Code Design and its Application in Power-Efficient Cooperative Communications", *IEEE Communication Surveys and Tutorials*, vol. 14, no. 3, pp. 858–883, 2012, DOI: 10.1109/SURV.2011.081511.00104 **(IF: 6.311)**

24. **M. F. U. Butt**, R. A. Riaz, S. X. Ng and L. Hanzo, "Near-Capacity Iterative Decoding of Binary Self-Concatenated Codes Using Soft Decision Demapping and 3-D EXIT Charts", *IEEE Transactions on Wireless Communications*, Vol. 9, no. 5, pp. 1608-1616, 2010, DOI: 10.1109/TWC.2010.05.081254 **(IF: 2.152)**

25. **M. F. U. Butt**, R. A. Riaz, S. X. Ng and L. Hanzo, "Distributed Self-Concatenated Coding for Cooperative Communications", *IEEE Transactions on Vehicular Technology*, Vol. 59, no. 6, pp. 3097-3104, 2010, DOI: **(IF: 1.490)**

26. R. A. Riaz, R. G. Maunder, **M. F. U. Butt**, S. X. Ng, S. Chen and L. Hanzo, "EXIT-Chart Aided Three-stage Concatenated Ultra-WideBand Time-Hopping Spread-Spectrum Impulse Radio Design", *IEEE Transactions on Vehicular Technology*, vol. 58, no. 9, pp. 5320-5324, 2009, DOI: **(IF: 1.488)**

27. S. X. Ng, **M. F. U. Butt** and L. Hanzo, "On the Union Bounds of Self-Concatenated Convolutional Codes", *IEEE Signal Processing Letters*, vol. 16, no. 9, pp. 754-757, 2009, DOI: **(IF: 1.173)**

28. R. A. Riaz, **M. F. U. Butt**, S. Chen and L. Hanzo, "Generic z-domain discrete-time transfer function estimation for ultra-wideband systems", *Electronics Letters*, Vol. 44, pp. 1491-1492, 2008, DOI: **(IF: 1.140)**

Article published in ISI Indexed journal:

29. Y. Li, S. Ghafoor, **M. F. U. Butt** and M. El-Hajjar, "Analog radio over fiber aided C-RAN: Optical aided beamforming for multi-user adaptive MIMO design", *Frontiers in Communications and Networks,* Vol. 2, 2021. DOI=10.3389/frcmn.2021.725976.

30. R. Yaqub, F. A. Shifa and **M. F. U. Butt**, "Preferential Charging for Government Authorized Emergency Electrical Vehicles", *Int. J. of Grid and Utility Computing*, vol. 11, no. 2, pp. 278 – 289, 2020, DOI: 10.1504/IJGUC.2020.105542.

Papers published in conference proceedings:

1. M. Zulfiqar, **M. F. U. Butt**, A. Ramay and I. Shafi, "*Abnormality Detection in Cardiac Signals using Pseudo Wigner-Ville Distribution with Pre-trained Convolutional Neural Network"*, 13th International Conference on Signal Processing and Communication Systems ICSPCS' 2019, 16-18th Dec. 2019, Surfers Paradise, Gold Coast, Australia.

2. **M. F. U. Butt,** R. Yaqub, M. Hammad, M. Ahsen, M. Ansir and N. Zamir, "Implementation of Aquaponics Within IoT Framework", IEEE SoutheastCon 2019, 11-14 April 2019, Hunsville, Alabama, USA.

3. N. Zamir, **M. F. U. Butt**, Z. Babar and S. X. Ng, "Secure Quantum Turbo Coded Superdense Coding Scheme", IEEE 29th Annual International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC), 9-12 Sept 2018, Bologna, Italy.

4. S. Habib, G. I. Kiani and **M. F. U. Butt**, "An Efficient FSS Absorber for WLAN Security", 2017 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting in San Diego, California, July 9-14, 2017.

5. S. Habib, G. I. Kiani, **M. F. U. Butt**, "An efficient UWB FSS for electromagnetic shielding", ICEAA - IEEE APWC 2017, 11-15 Sept 2017, Verona, Italy.

6. H. M. F. A. Madani, **M. F. U. Butt**, N. Zamir and Soon Xin Ng, "Relay Node Selection and Power Allocation for Distributed Self-Concatenated Convolutional Codes", IEEE Wireless Communication and Networking Conference WCNC, 19-22 Mar 2017, San Francisco, CA, USA.

7. B. Ali, N. Zamir, **M. F. U. Butt** and S. X. Ng, "Physical Layer Security: Friendly Jamming in an Untrusted Relay Scenario", 24th European Signal Processing Conference (EUSIPCO), Aug 29 - Sept 2, 2016, Budapest, Hungary.

8. N. Zamir, B. Ali, **M. F. U. Butt** and S. X. Ng, "Improving Secrecy Rate via Cooperative Jamming based on Nash Equilibrium", 24th European Signal Processing Conference (EUSIPCO), Aug 29 - Sept 2, 2016, Budapest, Hungary.

9. S. Habib, **M. F. U. Butt** and G. I. Kiani, "Interference Mitigation and WLAN Efficiency in Modern Buildings Using Energy Saving Techniques and FSS", 2016 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting AP-S/URSI 2016, Jun 26 - July 1, 2016, Fajardo, Puerto Rico, USA.

10. S. Habib, **M. F. U. Butt** and G. I. Kiani, "Parametric Analysis of a Band-Pass FSS for Double Glazed Soft-Coated Energy Saving Glass", International Symposium on Antennas and Propagation (ISAP2015), 9-12th Nov 2015, Hobart, Australia.

11. S. P. B. Wasti, Y. Rehman, A. Aziz and **M. F. U. Butt**, "An IDMA Aided Superposition Coding Scheme for Multi-Source Cooperation", 12th International Conference on Frontiers of Information Technology (FIT), 17-19 Dec. 2014, Islamabad, Pakistan.

12. H. M. F. A. Madni, B. Ali and **M. F. U. Butt**, "Study and Analysis of Channel Estimation Techniques for OFDM Based Wireless Communication Systems", 12th International Conference on Frontiers of Information Technology (FIT), 17-19 Dec. 2014, Islamabad, Pakistan.

13. Y. Huo, M. El-Hajjar, **M. F. U. Butt** and L. Hanzo, "Inter-Layer-Decoding Aided Self-Concatenated Coded Scalable Video Transmission", IEEE Wireless Communications and Networking Conference (WCNC): Services & Applications, Shanghai, China, 7-10 April 2013.

14. F. A. Shifa and **M. F. U. Butt**, "A Feasibility Study for Deployment of Wind Energy Based Power Production Solution in Islamabad, Pakistan", in Proceedings of the IEEE International Conference on Emerging Technologies (ICET 2012), Islamabad, Pakistan, 8-9 Oct. 2012.

15. Nasruminallah, **M. F. U. Butt**, M. El-Hajjar, S. X. Ng and L. Hanzo, "Self-Concatenated Coding and Multi-Functional MIMO Aided H.264 Video Telephony", in Proceedings of the IEEE Vehicular Technology Conference (VTC-2011 Fall), San Francisco, USA, 2011.

16. Nasruminallah, **M. F. U. Butt**, M. El-Hajjar, S. X. Ng and L. Hanzo, "H.264 Wireless Video Telephony Using Iteratively-Detected Binary Self-Concatenated Coding", in Proceedings of the IEEE Vehicular Technology Conference (VTC-2010 Spring), Taipei, Taiwan, May 2010.

17. **M. F. U. Butt**, R. Zhang, S. X. Ng and L. Hanzo, "Superposition Coding Aided Bidirectional Relay Transmission Employing Iteratively Decoded Self-Concatenated Convolutional Codes", in Proceedings of the IEEE Vehicular Technology Conference (VTC-2010 Spring), Taipei, Taiwan, May 2010.

18. R. A. Riaz, **M. F. U. Butt**, S. X. Ng, S. Chen and L. Hanzo, "Near-Capacity UWB Impulse Radio Using EXIT Chart Aided Self-Concatenated Codes", in Proceedings of the IEEE Vehicular Technology Conference (VTC-2009 Fall), Anchorage, Alaska, September 2009.

	19. **M. F. U. Butt**, R. A. Riaz, S. X. Ng and L. Hanzo, "Distributed Self-Concatenated Codes for Low-Complexity Power-Efficient Cooperative Communication", in Proceedings of the IEEE Vehicular Technology Conference (VTC-2009 Fall), Anchorage, Alaska, September 2009.
	20. R. A. Riaz, R. G. Maunder, **M. F. U. Butt**, S. X. Ng, S. Chen and L. Hanzo, "Three-Stage Concatenated Ultra-Wide bandwidth Time-Hopping Spread-Spectrum Impulse Radio using Iterative Detection", in Proceedings of the IEEE ICC'09, 14-18 June, Dresden, Germany, June 2009.
	21. R. A. Riaz, **M. F. U. Butt**, S. Chen and L. Hanzo, "Optimized Irregular Variable Length Coding Design for Iteratively Decoded UltraWideBand Time-Hopping Spread-Spectrum Impulse Radio", in Proceedings of the IEEE Vehicular Technology Conference (VTC-2009 Spring), Spain, April 2009.
	22. **M. F. U. Butt**, R. A. Riaz, S. X. Ng and L. Hanzo, "Near-Capacity Iteratively Decoded Binary Self-Concatenated Code Design Using EXIT Charts", in Proceedings of the IEEE Global Communications Conference, GLOBECOM '08, (New Orleans, USA), Nov/Dec 2008.
	23. **M. F. U. Butt**, S. X. Ng and L. Hanzo, "EXIT Chart Aided Design of Near-Capacity Self-Concatenated Trellis Coded Modulation Using Iterative Decoding", in Proceedings of the 67th IEEE Vehicular Technology Conference (VTC-2008 Spring), pp. 734-738, May 2008.
Computing Skills	▪ Expert with more than 10 years of experience in Linux and Windows Operating Systems, MATLAB/Simulink and IT++. ▪ Extensively used MATLAB, IT++ and Microsoft Excel for data analysis and interpretation. ▪ Experience of more than 5 years in LabVIEW, Code Composer Studio, Verilog and ModelSim.
Affiliations	▪ Member IEEE (since 2008), Member IEEE Communications Society (since 2011) Membership Number: 90384960 ▪ Professional Engineer registered with Pakistan Engineering Council (PEC) ▪ PEC Approved Program Evaluator (PEV)/Expert Electrical Engineering
Soft Skills	▪ Excellent interpersonal, social and managerial skills ▪ Excellent Proficiency in written and spoken English
Reviewer/ External Examiner/ Services	▪ IEEE Access, IEEE Transactions on Wireless Communications, IEEE Wireless Communications Letters, IEEE Antenna and Wireless Propagation Letters, KSII Transactions on Internet and Information Systems ▪ Editorial Board of Data Science for Communications, Frontiers in Communications and Networks ▪ TPC, International Multi-Topic Conference 2012 and FIT Conferences 2012, 2018 and 2019 ▪ PhD External Examiner: University of Engineering and Technology Taxila, Pakistan (A. Iftikhar 2021), University of Engineering and Technology Peshawar, Pakistan (A. Khalil 2021) & National University of Sciences and Technology, Islamabad, Pakistan (D. Sabir 2022, S. Shakil 2021 and M. Waseem 2020) ▪ Special Invitee, Sub-Group Telecom Engineering, ECRDC for Electrical and Allied Engineering under PEC 2019-20 ▪ Member Board of Studies in Electronics Engineering, The Islamia University of Bahawalpur, Pakistan
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