Dr. Badar Muneer

PROFESSIONAL SUMMARY

I am currently working as Researcher at University of Perugia, Italy on Horizon Europe funded project. Formerly, i was research associate professor with a leading Engineering University. I am also serving as Manager of Antennas & Microwave Laboratory and FM Radio Station. I have 12+ years of experience working in industry as well as in academia. In the past, I was associated with satellite and broadcast media industry as Satellite Engineer. I have been involved in teaching and R&D in antennas and microwaves for the last 10 years.

I was also engaged in University of Malaga, Spain as a visiting Faculty under ERASMUS+ program. I was awarded CAS President's prestigious Postdoctoral Fellowship in 2016. I am a reviewer for several renowned journals. I am an active IEEE Senior Member and advisor of IEEE MTT society SBC at MUET.My research expertise includes but not limited to antennas, microwave and mm-wave circuits and components testing and design, wearable biomedical devices electronics, Smart city solutions, high frequency simulation and fabrication, metamaterials, liquid alloy-based antennas, internet of things AI in ICT.

2012 - 2015

DOCTOR OF PHILOSOPHY (PhD) – University of Science & Technology of China (USTC) --- Anhui, Hefei, P.R China.

- Specialization: Electromagnetic Fields & Microwave Technology
- Dissertation: Substrate integrated waveguide based power dividers and controllable phase shifters

2009 - 2011

MASTER OF ENGINEERING – NED University of Engineering & Technology (NEDUET) --- Karachi, Pakistan.

- Specialization: Telecommunication Engineering
- Dissertation: design and simulation of 16 elements, 4x4 substrate integrated waveguide antenna array

2004 - 2008

BACHELOR OF ENGINEERING – Institute of Space Technology, Islamabad (IST) --- Islamabad, Pakistan.

- Specialization: Communication Systems Engineering
- Dissertation: Design and implementation of 8-element micro strip patch antenna array

2011 - 2012

DIPLOMA IN CHINESE LANGUAGE – Anhui Normal University

(ANU) --- Anhui, Wuhu, P.R China.

Degree: HSK level 4

PROFESIONAL EXERIENCE

01.11 - 2023-Present

RESEARCHER (OPEVA PROJECT-HORIZON EUROPE)

UNIVERSITY OF PERUGIA, DEPARTMENT OF ENGINEERING, ITALY

OPEVA - OPtimization of Electric Vehicle Autonomy

Key Responsibilities

- Design and development of UHF RFID-based energy autonomous wireless sensors for EV battery's SoH and SoC estimation management.
- Design of custom integrated antennas for battery cell mounted wireless sensors and establishing communication between battery cells and Battery Management Unit.
- developing an energy-efficient power train and dynamic routing, into improving accurate range prediction techniques, improving EV grid integration, developing efficient charging technologies and guaranteeing a wider EV adoption.

10.2016 - Nov 2023

ASSOCIATE PROFESSOR (BPS-20)

MEHRAN UET, JAMHSORO.

Research Areas

- o Microwave Engineering, electromagnetics.
- o Wave Propagation & Antennas, wearable antennas,
- Satellite Communication, Internet of Things

Thesis Supervised

- o Undergraduate: 20+
- o Masters: 5+
- o PhD: 2 ongoing

2019.08 - 2019.9

VISITING FACULTY (ERASMUS PLUS PROGRAM)

UNIVERSITY OF MALAGA, E.T.S.I. DE TELECOMUNICACIÓN, MALAGA, SPAIN

 Worked on joint research project related to flexible antenna design, liquit metal antennas and 3D printed antennas for future electronics.

2016.06 - 2018.5

POSTDOCTORAL FELLOW/PROJECT LEAD

KEY LABORATORY OF ELECTROMAGNETIC SPACE INFORMATION, CHINESE ACADEMY OF SCIENCE, ANHUI, CHINA.

2016 - 10.2019

ASSISTANT PROFESSOR (BPS-19)

DEPARTMENT OF TELECOMMUNICATION ENGINEERING, MEHRAN UNIVERSITY OF ENGINEERING AND TECHNOLOGY,



Courses taught (Undergraduate & Graduate Level)

- Microwave Engineering
- Wave Propagation & Antennas
- Signals & Systems

Thesis Supervised

- Substrate Integrated Waveguide based PIFA antenna.
- Wearable antennas: Textile and Liquid metal based body worn antennas

2011 - 2015

RESEARCH FELLOW

UNIVERSITY OF SCIENCE AND TECHNOLOGY OF CHINA FREDRICH ALEXANDER UNIVERSITAT ERLANGEN-NURNBERG GERM



FAU

MaResearch Activities

Worked with Prof. Dr. Zhu Qi (USTC) and Prof. Dr. Martin Vossiek (FAU) on projects supported by National Natural Science Foundation of China and Chinese Academy of Science (CAS) to design novel microwave and millimeter-wave devices. The emphasis of research was towards developing compact substrate integrated waveguide (SIW) with low loss and low cost, such as power dividers, phase shifters and antennas for phased array applications as well as microwave absorbers and meta-materials (Negative indexed materials). As a result, we were successful in developing some novel power dividers and phase shifters with unique performances, which are also published and available online. On the other hand, we also worked towards studying the properties of Carbon Nano Tubes (CNTs) and their applications. The details of our work can be found in research and publication section.

2011 - 2012

RESEARCH ANALYST (CONSULTANT)

6B GLOBAL BROADCAST SOLUTIONS

Key Resopnsibilites



- Working on ground communication Equipment, antennes and IPTV network at satellite earth station (LNA, BPF, Demod, HPA, Network analyzer, Spectrum analyzer etc)
- Developing new ideas for up gradations and project extension

2008 - 2015

SATELLITE ENGINEER

SAMAA TELEVISION NETWORK/CNBC PAKISTAN





- Satellite link optimization, frequency coordination and Frequency reuse planning etc.
- Installation, maintenance and troubleshooting of all Uplink/Downlink equipment. For two satellite channels, Samaa TV and CNBC Pakistan (as a Consultant)

HONORS, AWARDS AWARDS & ACHIEVEMENTS

2023 OUTSTANDING PERFOMANCE AWARD 2023 Awarded by the Vice Chancellor in recognition of my research contributions and funded project.

2017 BEST PAPER AWARD 2017 IEEE AP-S Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting July 9–14, 2017, San Diego, California, USA

2016
INNOVATION AWARD awarded to project "Liquid metal shape reconfigurable antennas" at Invention to Innovation Summit, Quetta 2016 organized by ORIC of University of Balochistan in collaboration with IRP, PASTIC, PSF, SATHA and other Universities of Balochistan.

HEC SCHOLARSHIP Awarded partial support scholarship for PhD studies abroad Higher Education Commission of Pakistan

TPC MEMBER IEEE 4th Asia-Pacific Conference on Antennas and Propagation, Bali, Indonesia (30 June – 3 July 2015).

2015

- GEMIC 2015 TRAVEL GRANT Awarded fully funded grant to present distinguished paper at German Microwave Conference, Nurnberg, Germany (16 19 March 2015)
- 2014 RESEARCH FELLOWSHIP Awarded research fellowship co-sponsored by Key Laboratory of Electromagnetic Space Information, Chinse Academy of Science (USTC) and LHFT Germany to undertake PhD research.
- PHD RESEARCH SCHOLARSHIP Awarded Scholarship to PhD degree at
 University of Science and Technology of China(USTC) funded by Chinese
 Scholarship council (CSC) under Chinese Government Scholarship
 Scheme for international students.
 - FOREIGN EMBASSADOR Nominated by International school of USTC to host and coordinate the event organized by government of China in Hefei.

 The events focused on international collaboration of Chinese universities.

PROFESSIONAL ASSOCIATIONN & ACTIVITIES

2011

3-DAYS WORKSHOP ON VECTOR NETWORK ANALYZER Successfully organized hands-on training on microwave measurements using Vector Network Analyzer, at Department of Telecommunication Engineering, MUET, Jamshoro.

SEMINAR ON PCB FABRICATION LASER PROTOTYPING Successfully organized a seminar on "In-House PCB Prototyping on LPKF Protomat" under the umbrella of IEEE Microwave Theory and Techniques Society (MTT-S) SB Chapter at MUET.

PROJECT EXIHIBITION AND POSTER SESSION Project Exhibition for the students of 13 TL/12 TL Batch was organized at Department of Telecommunication, Mehran University of Engineering & Technology Under the umbrella of IEEE (MTT-S and COMSOC) Societies

RF & MICROWAVE SYMPOSIUM (NATIONAL INSTRUMENTS, KARACHI)
Attended symposium on rf & microwave measuremnts and software defined radios by national instruments at movenpick hotel, karachi.
faculty advisor/organizer

CHAPTER CHAIR

❖ IEEE Micorwave Theory and Techniques Karachi Section Chapter-2023

MEMBERSHIPS AND ASSOCIATIONS

- Senior Member IEEE (Membership#: 93784647)
- Member IEEE Microwave Theory and Techniques Society
- Faculty Advisor: IEEE MTTs Student Branch Chapter at MUET, Jamshoro.

- Member Pakistan Engineering Council (Membership#: TELE/921)
- Life Member: IEEE Pakistan
- Convener, Industrial Liaison Committee, Mehran University, Jamshoro
- Member Board of Studies, Thesis Committee at MUET Jamshoro and IBA Sukkur.

SCHOLARLY PEER REVIEWER

- Journal of Applied Physics (JAP)
 - o July 2014 Present AIP advances, USA.
- IEEE Microwave and Wireless Component Letters
 - Jan 2015 Present IEEE MTTs, USA.

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- o May 2014 Present IOS Press, STM Publishing house, Japan.
- Wireless Engineering and Technology (WET)
 - o May 2014 Present Scientific Research Publishing, NY, U.S.A.
- Open Journal of Antennas and Propagation (oJAPr)
 - o May 2014 Present Scientific Research Publishing, NY, U.S.A.
- Engineering,
 - May 2014 Present (1 month) Scientific Research Publishing, NY, U.S.A.
- Journal of Electronics (China)
 - May 2014 Present Institute of Electronics, Chinese Academy of Sciences, China.
- Journal of Electromagnetic Analysis and Applications (JEAA)
 - May 2014 Present Scientific Research Publishing, NY, U.S.A.
- International Journal of Electromagnetics and Applications (IJEA)
 - May 2014 Present Scientific & Academic Publishing, USA.

RESEARCH PUBLICATIONS

- [1] Badar Muneer, Faisal Karim Shaikh, Naeem Mahoto, Shahnawaz Talpur, Jordi Garcia, "Al and Its Convergence with Communication Technologies", IGI Global, USA, 2023. [Book]
- [2] H Talpur, B Muneer, FK Shaikh, UA Korai, "Design of Phased Array Systems for LoRA Applications", 7th International Multi-Topic ICT Conference-IMTIC, 2023.
- [3] H Talpur, B Muneer, MA Memon, N Abbas, A Waqas, "Al-Powered Antennas and Microwave Components", Al and Its Convergence with Communication Technologies, 97-136, IGI Global Publishers, 2023.
- [4] Hafsa Talpur, Badar Muneer, Faisal Karim Shaikh, Umair Ahmed Korai "Design of Phased Array Antenna System for LoRa Applications", 2023 7th International Multi-Topic ICT Conference (IMTIC), Jamshoro, 2023.
- [5] Mirza Ehsan, Umair Ahmed Korai, Abi Waqas Memon, Anayat Ullah, Badar Muneer, Aftab Ahmed Memon, "Availability of Free Space Optical links of Hyderabad Pakistan using Climate Data", Global Conference on Wireless and Optical Technologies (GCWOT), Malaga, Spain, 2023.
- [6] Kaleemullah Shaikh, Abi Waqas, Umair Ahmed Korai Baloch, Badar Muneer, Aftab Memon, "Cost-Effective Portable Photonic Sensor for Liquid Adulteration Detection", IEEE 19th International Conference on Smart Communities: Improving Quality of Life Using ICT, IoT and AI (HONET), USA, 2022.

- [7] Muhammad Azlan, Badar Muneer, Bhawani Shankar Chowdhry, "Lungs Fluid Accumulation Detection Using Microwave Imaging Technique", 2022 International Conference on Emerging Technologies in Electronics, Computing and Communication (ICETECC), MUET, Pakistan, 2022.
- [8] Hafsa Talpur, Badar Muneer, Bhawani Shankar Chowdhry, Muhammad Zakir Sheikh, "Development of Software/Hardware platform For Wideband Antenna Measurement", 2022 International Conference on Emerging Technologies in Electronics, Computing and Communication (ICETECC), MUET, Pakistan, 2022.
- [9] P Soothar, H Wang, C Xu, Y Quan, ZA Dayo, M Aamir, B Muneer, "A Miniaturized Broadband and High Gain Planar Vivaldi Antenna for Future Wireless Communication Applications," International Journal of Antennas and Propagation 2021.
- [10] B Muneer, BS Chowdhry, H Zafar, Z Ali, FK Shaikh, "Polarization Agile Antenna for Underwater Communication Using Integrated Power Divider and Phase Shifter," Wireless Personal Communications 116 (2), 1137-1149, 2021.
- [11] P Soothar, H Wang, B Muneer, ZA Dayo, BS Chowdhry, "A broadband high gain tapered slot antenna for underwater communication in microwave band," Wireless Personal Communications 116 (2), 1025-1042, 2021.
- [12] Yi, Zixuan; Li, Meiling; Muneer, Badar; Zhu, Qi, "High-efficiency midrange inductive power transfer employing alternative-winding coils," IEEE Transactions on Power Electronics, Vol. 11 (1), 107, 2018. (IF: 6.565)
- [13] Yi, Zixuan; Li, Meiling; Muneer, Badar; He, Guoqiang; Yang, Xue-Xia;," Impedance Matching and Fast Calculation of Efficiency for an Inductive Power Transfer System Using an Array of Magnetically Coupled ResonatorsSelf-Resonant Antisymmetric Planar Coil for Compact Inductive Power Transfer System Avoiding Compensation Circuits" IEEE Transactions on Power Electronics, 2020. [Early Access] [IF: 7.1]
- [14] Deng Ruixiang, Li Meiling, **Badar Muneer**, Zhu Qi, Shi Zaiying, Song Lixin and Zhang Tao" The theoretical analysis of ultrathin broadband optically transparent metamaterial absorbers," Materials, Vol. 11 (1), 107, 2018. (IF: 2.654)
- [15] Zixuan Yi, Meiling Li, **Badar Muneer** and Zhu Qi," Impedance Matching and Fast Calculation of Efficiency for an Inductive Power Transfer System Using an Array of Magnetically Coupled Resonators" IEEE Transactions on Power Electronics, 2017. [Early Access] [IF: 7.1]
- [16] Meiling Li, **Badar Muneer**, Zixuan Yi and Zhu Qi," A Broadband Compatible Multispectral Metamaterial Absorber for Visible, Near-infrared and Microwave Bands" Advanced Optical Materials, Wiley, Vol. 6 (9), 1701238, 2018. [IF: 6.8]
- [17] Sun Guilin, **B. Muneer** and Qi Zhu," Ultra-Compact Implantable Design with Integrated Wireless Power Transfer and RF Transmission Capabilities," IEEE Transaction on Biomedical Circuits and Systems, Vol. 12 (2), 281-291 2018. (IF: 2.93)
- [18] Yulong Xia, **B. Muneer** and Qi Zhu," Design of a Full Solid Angle Scanning Cylindrical-and-Conical Phased Array Antennas," IEEE Transactions on Antenna & Propagation, Vol 56(9), pp, 4645-4655, 2017. (IF: 2.95)

2021

2020

2018

- [19] Korai, U. A., Shaikh, F. K., Kalwar, S., Soothar, K. K., Muneer, B., & Solangi, A."Analyzing the Quality of Free Space Optical Signal in Fog: A Case Study of Pakistan." Wireless Personal Communications 95.2 (2017): 569-579.
- [20] Badar Muneer, Waseem Shabir, Faisal K. Shaikh and Zhu Qi," Plate-Laminated waveguide transverse slot fed 2×3 PIFA array," 2017 IEEE AP-S Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting, San Diego, CA, 2017.
- [21] Muneer, B., Shabir, W., & ShaiNh, F. K. (2017). Plate-Laminated Slotted-Waveguide Fed 2× 3 Planar Inverted F Antenna Array. World Academy of Science, Engineering and Technology, International Journal of Electrical, Computer, Energetic, Electronic and Communication Engineering, 11(1), 129-132.
- [22] Meiling Li, Zixuan Yi, **B. Muneer** and Qi Zhu, "A Novel Integrated Switchable Absorber and Radiator," IEEE Transactions on Antenna & Propagation, Vol 64 (3), pp. 944-952, 2016. <DOI: 10.1109/TAP.2016.2515121>
- [23] **Badar Muneer**, Sensong An, A.W Umrani, F.K Shaikh, "A generalized approach to analyze broadband arrow-shaped loaded-stub phase shifters," Advance Electromagnetics Symposium (AES), Malaga, Spain, Jun 2016.
- [24] **B. Muneer**, Qi Zhu and Shanjia Xu Fellow, IEEE, "A Broadband Tunable Multilayer Substrate Integrated Waveguide Phase Shifter," *IEEE Microwave and Wireless Components Letters*, Vol 25 (4), pp. 220-222, 2015. (IF: 2.23)
- [25] **Badar Muneer** and Qi Zhu, "A Novel Two-layer Electronically Controllable Substrate Integrated Waveguide Phase Shifter," 2015 German Microwave Conference (GeMic), Nurnberg, Germany, pp. 158-161 March 2015.
- [26] B. Muneer, Qi Zhu and Shanjia Xu Fellow, IEEE, "A Digital SIW Phase Shifter Implemented by Switching Transverse Slots via PIN Diodes," FREQUENZ Journal of RF-Engineering and Telecommunications, Vol 69 (9-10), pp. 383-387, Jan 2015. [DOI: 10.1515/freq-2015-0007] (IF: 0.39)
- [27] **B. Muneer**, Yulong Xia, Qi Zhu and Shanjia Xu Fellow, IEEE, "Design of N-Way SIW Radial Power Divider Based on Equivalent Circuit Model," *FREQUENZ Journal of RF-Engineering and Telecommunications*, Jan 2015. (IF: 0.39)
- [28] Sensong An, **B. Muneer**, Qi Zhu, "Generalized Analysis Method for a Class of Novel Wideband Loaded-Stub Phase Shifters," *RADIOENGINEERING*, 2015. (IF: 0.65)
- [29] **Badar Muneer** and Qi Zhu, "A Novel Two-layer Electronically Controllable Substrate Integrated Waveguide Phase Shifter," GeMiC2015 German Microwave Conference, Nurnberg, Germany, March 2015.
- [30] Hong Xu, Yulong Xia, **Badar Muneer** and Qi Zhu, "Design of Polarization-Agile Antenna by Using Integrated Structure of Phase Shifter and Power Divider," IEEE 4th Asia-Pacific Conference on Antennas and Propagation, Bali Island, Indonesia, 2015.
- [31] Guilin Sun, **Badar Muneer** and Qi Zhu, "A Study of Microstrip Antenna Made of Transparent ITO Films," *IEEE International Symposium on Antennas and Propagation and USNC-URSI National Radio Science Meeting*, Memphis, Tennessee, USA, July 2014.

2016

2015

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- [32] Meiling Li, Zixuan Yi, Badar Muneer and Qi Zhu, "A Negative Inductance Circuit for Broadband Artificial Magnetic Conductors," IEEE International Symposium on Antennas and Propagation and USNC-URSI National Radio Science Meeting, Memphis, Tennessee, USA, July 2014.
- [33] Ru Meng, Heng Zhang, Badar Muneer and Qi Zhu, "The Design of a 48-way High Power Capacity Sectorial Waveguide Power Divider," IEEE International Symposium on Antennas and Propagation and USNC-URSI National Radio Science Meeting, Memphis, Tennessee, USA, July 2014.
- [34] Zixuan Yi, Meiling Li, Badar Muneer and Qi Zhu, "A Novel Compact Microstip Resonant Antenna," Asia Pecific Conference on Antenna and Propagation, Harbin, China, July 2014.
- [35] B. Muneer, A. H. Awan and Q. U. Islam, "Design, substrates comparison and fabrication of 8-element high gain microstrip patch antenna," in 2008 2nd International Conference on Advances in Space Technologies, 2008, vol. 2, pp. 12–17.

2008

RESEARCH PROJECTS AND FUNDING

2018 (Ongoing)

COVSCAN: DEVELOPMENT OF SMART NON-CONTACT IR TEMPERATURE SCANNING AND ONLINE DATABASE INTEGRATED WITH RFID AUTHENTICATION

Funding Agency

Sindh Higher Education Commission of Pakistan

Principal Investigator:

Dr. Badar Muneer

Co-Principal Investigator:

Prof. Dr. Bhawani Shankar Chowdhry

Project Duration

24 months

Granted Amount

PKR 5 Million

LOW INSERTION LOSS DIGITAL PHASE SHIFTER

Funding Agency

HUAWEI TECHNOLOGIES, CHINA HIRP OPEN 2018 (NRPU 2016/17)

Grant#

Principal Investigator:

Prof. Dr. Zhu Qi, USTC China

Co-Principal Investigator:

Dr. Badar Muneer

Project Duration

8 months

Granted Amount

USD 70000

2017 (Ongoing)

LIQUID ALLOYS BASED RECONFIGURABLE ANTENNAS

Funding Agency

Higher Education Commission of Pakistan (HEC)

National Research Program for Universities (NRPU 2016/17)

Grant# 6876

Principal Investigator:

Dr. Badar Muneer, Assistant Professor, MUET

Co-Principal Investigator:

Prof. Dr. Bhawani Shankar Chowdhry

Project Duration

24 months

Granted Amount

PKR 11 Million

2016 (Completed)

SIW METAMATERIALO BASED POWER DIVIDERS AND PHASE SHIFTERS

Funding Agency

Chinese Academy of Science (Grant# 2016PM046)

Principal Investigator:

Dr. Badar Muneer, Assistant Professor, MUET

Co-Principal Investigator:

Prof. Dr. Zhu Qi, Prof. Dr. Yu Nenghai (USTC)

Project Duration

8 months

Granted Amount

PKR 6.5 Million

2016 (Completed)

SUBSTRATE INTEGRATED WAVEGUIDE METAMATERIAL BASED ANTENNAS FOR FUTURE ELECTRONICS

Funding Agency

Higher Education Commission of Pakistan, SRGP (Grant# SRGP-772)

Principal Investigator:

Dr. Badar Muneer, Assistant Professor, MUET

Co-Principal Investigator:

Dr. Faisal Karim Shaikh, Associate Professor/Chairman MUET.

Project Duration

8 months

Granted Amount

PKR 0.378 Million

2016 (Completed)

FFS BASED METAMATERIAL ABSORBERS AND RADIATORS

Funding Agency

National Natural Science Foundation of China (NSFC) (Grant# 61131002)

Principal Investigator:

Prof. Dr. Li-Xin Ran, Zhejiang University, Hangzhou

Researchers:

1) Prof. Dr. Zhu Qi, University of Science & Technology of China (USTC),

Anhui, Hefei

2) Badar Muneer, PhD Scholar, University of Science & Technology of China (USTC), Anhui, Hefei

Granted Amount

Total funding: 467210 USD

Funding assigned to researchers: 112774.99 USD

CURRENT RESEARCH INTERESTS AND ACTIVITIES

- Electromagnetic Field and Microwave Technology
- RF and Millimeter wave devices
- SIW power dividers, phase shifters and absorbers
- Antennas design and wave propagation

PROFESSIONAL REFERENCES

Professor Dr. B.S. Chowdhry

Member BOG Higher Education Commission,

Distinguished National Professor,

Former Dean and Meritorious Professor (BPS 22),

Professor Emeritus,

Faculty of Electrical, Electronics and Computer Engineering

Mehran University of Engineering & Technology, Jamshoro - Pakistan

Email: c.bhawani@ieee.org Website: bschowdhry.info

Prof. Dr. Mohammad Aslam Ugaili

Professor Meritorious and

Vice Chancellor Mehran University of Engineering & Technology

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Email: aslamuqaili@yahoo.co.uk

Prof. Dr. Faisal Karim Shaikh

Full Professor/Chairman, Member Board of Governors, Department of Telecommunication Engineering, Mehran University of Engineering &

Technology, Jamshoro Faisal.shaikh@faculty.muet.edu.pk

Tel: +92 0334 3/'

144087

Relationship: He was my immediate boss for last 6 years (as a Chairman of the Department)

Shahid ur Rehman

Group Executive Director
Jaag Broadcasting Systems (Pvt) Ltd.
Samaa Television,

I.I Chundrigar Road, Karachi, Pakistan

Office:

Cell:

Email: shahid.rehman@samaa.tv