ARIF ULLAH KHAN

Graduate Research Assistant
Telecommunication and Networking (TeleCoN) Research Lab
GIK Institute of Engineering Sciences and Technology Topi, 23640, Pakistan.

PERSONAL INFORMATION

PERMANENT ADDRESS:	Barhampatti PO Fatehpur, Khwaza Khela Swat 19130, Pakistan.
PHONE (OFFICE):	+92-938-281026 Extension: 2684
MOBILE:	+923449800377
EMAIL:	arifullah@giki.edu.pk , engrz.ciit@gmail.com
WEB PAGE:	www.arifkhaan.github.io/
LINKEDIN:	www.linkedin.com/in/arifullah012/
GOOGLE SCHOLAR:	shorturl.at/lqzH1
ORCID:	0000-0002-0555-6644

RESEARCH INTERESTS

- Wireless communications; 5G and beyond 5G networks;
- Heterogeneous cellular networks; Stochastic geometry.
- Millimeter wave communications; UAV assisted communication.
- Signal processing; Massive MIMO; NOMA; Re-configurable intelligent surfaces.
- Machine learning and AI enabled wireless communication.

EDUCATION

2017-2021 | DOCTOR OF PHILOSOPHY, ELECTRONICS ENGINEERING
GIK Institute of Engineering Sciences and Technology Topi, 23640, Pakistan.
Study Emphasis: Wireless Communication and Networking
PhD Dissertation: User-centric Small Cells Deployment in Future Cellular Networks: A Transition from Sub-6GHz to Millimeter Wave Communications.
PhD Supervisor: Dr. Ziaul Haq Abbas

2014-2016 | MASTER OF SCIENCE, ELECTRICAL ENGINEERING
COMSATS University Tobe campus, Abbotabad, 22060, Pakistan.
Study Emphasis: Wireless Communication and Signal Processing
MS Dissertation: Precise Estimation of Soft Output for Sphere decoding MIMO OFDM Receiver using Modified Likelihood Ascent Search Algorithm.
MS Supervisor: Prof. Dr. Shahid Khattak

2008-2012 | BACHELOR OF SCIENCE, ELECTRONICS ENGINEERING
Balochistan University of Information Sciences, Engineering and Management Sciences, Takatu campus Quetta, 87100, Pakistan.
Study Emphasis: Electronics and Communication
BS Final year Project: Real time Tracking, Monitoring and Controlling of Vehicles through GPS and GSM.

Teaching/Professional Experience

2017-2020	GIK Institute of Engineering Sciences and Technology, Topi, Pakistan *Graduate Research/Teaching Assistant* **Responsibilities:** 1) Assisted as Teaching Assistant (TA) in Linear Circuit Analysis (EE-211) course (Fall 2017), 2) Assisted as lab instructor in Electronics Devices and Circuit Lab (EE-231L) (Spring 2018-2019), 3) Assisted as lab instructor in Signal and System Lab (EE-351L) (Fall 2018-2019), 4) Assisted as lab instructor in Communication System Lab (EE-361L) (Spring 2020)
2015-2016	COMWAVE Institute of Information Sciences and Technology, Abbotabad, Pakistan. *Visiting Lecturer* Teaching and Departmental Responsibilities
2015-2016	Egyptian Pakistani Telecommunication Company (EPTSC) *Trainee Engineer* textbfResponsibilities: Deal with issues related to operation and maintenance of mobile network.
2015-2016	Pakistani Telecommunication Company Limited (PTCL) *Internee*

Notable Graduate Projects

2019-2020	Hybrid Millimeter Wave Heterogeneous cellular networks This project investigate the user-centric small cell aided HCNet in hybrid millimeter wave setup.
2018-2019	User-centric small cells aided Heterogeneous cellular networks This project explore the modelling and performance evaluation hotspot aided user-centric small cell deployment using stochastic geometry in the conventional HCNet where all the BSs are operating in Sub-6GHz frequency band.
Spring 2018	Beam splitter design using metasurfaces This project design ultra-thin beam splitter Using a-Si:H based on phase gradient metasurfaces.
2015-2016	Precise estimation of soft output for sphere decoder In this project we precisely estimated soft output MIMO receiver using sphere decoding (SD) in augmentation with the low complexity modified likelihood ascent search algorithm (LAS) in MIMO OFDM system.
Spring 2015	Performance analysis of detection techniques for MIMO receiver Implemented different receiver algorithms including ZF, MMSE, SIC, sphere decoder and likelihood ascent search algorithms for MIMO detection.
Fall 2014	Design of UHF-RFID Tags with Meander-Line Antennas This project we explored different active and passive UHF-RFID tags and implemented small size meandered line antenna tag using HFSS for transportation application.

Publications

Journals

J1 **Arif Ullah**, Ziaul Haq Abbas, Fazal Muhammad, Ghulam Abbas and Shanshan Tu, "Downlink analysis of integrated Sub-6GHz and millimeter wave heterogeneous networks with spatially correlated user equipments," **Submitted** *to IEEE transaction on wireless Communication*. 2020.

J2 Fazal Muhammad, Samar Khan, M.S. Haroon, **Arif Ullah** and Nasim Ullah, Interference Mitigation in Intentional Jammers Aided Non-uniform Heterogeneous Cellular Networks, **Submitted** *to ELsvier Computer Communications*, 2020.

J3 **Arif Ullah**, Ziaul Haq Abbas, Fazal Muhammad, Irfanullah, Alam Zeb, Shahid Khattak, "Likelihood Ascent Search augmented Sphere Decoding Reciever for MIMO OFDM System with MQAM constellation," *IET Communication* **(in press)**, 2020.

J4 **Arif Ullah**, Ziaul Haq Abbas, Fazal Muhammad, Ghulam Abbas, Sunghwan Kim, "Uplink Performance Analysis of User-centric Small Cell Aided Dense HCNets with Uplink/Downlink Decoupling," *IEEE Access*, vol. 8, pp. 148460-148474, 2020. DOI:10.1109/ACCESS.2020.3015915

J5 **Arif Ullah**, Ziaul Haq Abbas, Ghulam Abbas, Fazal Muhammad, Lei Jiao, "Performance Analysis of User-Centric SBS Deployment with Load Balancing in Heterogeneous Cellular Networks: A Thomas Cluster Process Approach," *Computer Networks*, vol. 170, pp. 107120, 2020. DOI:10.1016/j.comnet.2020.107120

J6 Ziaul Haq Abbas, **Arif Ullah**, Ghulam Abbas, Fazal Muhammad, Frank Yong Li, "Outage Probability Analysis of User-Centric SBS based HCNets Under Hybrid Rician/Rayleigh Fading," " In *IEEE Communication Letters*., pp. 1–1, Dec, 2019. DOI:10.1109/LCOMM.2019.2959578

J7 **Arif Ullah**, Ziaul Haq Abbas, Ghulam Abbas, Fazal Muhammad, Lei Jiao, "Capacity Driven SBS Deployment in Heterogeneous Cellular Networks: Outage probability and Rate coverage Analysis," In *Transaction on Emerging Telecommunications Technologies*, 2019. DOI:10.1002/ett.3876

J8 Hammad Ahmad, Muhammad Mahmood Ali, **Arif Ullah**, Arbab Abdur Rahim, Husnul Maab, Mahmood Khan, "An Ultra-Thin Beam Splitter Design Using a-Si:H Based on Phase Gradient Metasurfaces," *Journal of Nanoelectronics and Optoelectronics*, vol. 14, pp. 1339-1343(5), September 2019. DOI:10.1166/jno.2019.2614

Conference Proceedings

C1 **Arif Ullah**, Ziaul Haq Abbas, Fazal Muhammad, Ghulam Abbas and Shanshan Tu, "Coverage Analysis in Multi Tier Hybrid Millimeter Wave Networks with Small Cell Aided Hotspots," **Submitted to** *IEEE Wireless Communications and Networking Conference (WCNC)*, Nanjing, China 29 Mar.-1 Apr. 2021.

C2 **Arif Ullah**, Ziaul Haq Abbas, Ghulam Abbas, Fazal Muhammad, "Analysis of Outage Probability and Rate Coverage in Heterogeneous Cellular Networks with joint uniform and clustered users," 20^{nd} *IEEE International Multi topic Conference (INMIC)*, Islamabad, Pakistan, 29-30 Nov. 2019. DOI:10.1109/INMIC48123.2019.9022767

Membership/Fellowship/Awards

2013-PRESENT	**Membership**, Pakistan Engineering Council (PEC) Registered Engineer with PEC, Reg #: ELECTRO/16479
2019-PRESENT	**Membership**, Institute of Electrical and Electronics Engineers (IEEE) Graduate student member IEEE , Membership #: 95038221
2017-2020	**Postgraduate Fellowship**, GIK Institute of Engg. Sci. & Tech., Awarded fully funded Scholarship with monthly stipend during PhD
2017-2020	**Prime Minister Scholarship**, COMSATS University, Abbotabad, Awarded with PM full fee reimbursement scholarship during MS

Graduate Courses

2014	Stochastic Processes (EEE-611), Optimization Techniques (EEE-712),, Microwave Passive Devices and Circuits (ETN-611), Electromagnetic Field Theory (ETN-610), Radio Engineering (ETN-616), Data Networks and Communication (ETN-671)
2015	Linear System Theory (ECI-665), Wireless Communication Techniques (ETN-644)
2017	Advance Algorithm and Computational Techniques (CS-506), Organic Semiconductor and Devices (EE-633)
2018	Computational Methods for Engineers (ES-531), Instrumentation and Control Systems (EN-541), Cyber Security and IOT (CS-520), Electromagnetic Meta materials (EE-613)

Special Training/Certification/Seminars

Seminars

S1 Attended seminar on "Writing Good Research Paper", 2020.

Languages

English:	Reading (Excellent), Writing (Excellent), Speaking (Excellent)
Urdu:	Reading (Excellent), Writing (Excellent), Speaking (Excellent)
Pushtu:	Mother tongue

Skills

- Simulink, Advance Design System (ADS), High Frequency Structured Simulation (HFSS), CST Microwave Studio, PSpice, Electronic Workbench
- Typesetting and Documentation: Microsoft Office, Power point and Excel
- Programming Languages: Python (basic), C/C++, MATLAB, Mathematica, Assembly language
- Scripting Languages: LaTeX

References

Dr. Ziaul Haq Abbas	Associate Professor, GIK Institute of Engineering Sciences and Technology Topi, 23640, Pakistan. Email: ziaul.h.abbas@giki.edu.pk, Phone: +92-312-5522633
Dr. Ghulam Abbas	Associate Professor, GIK Institute of Engineering Sciences and Technology Topi, 23640, Pakistan. Email: abbasg@giki.edu.pk, Phone: +92-312-5432666
Prof. Dr. Shahid Khattak	Professor, VC, University of Engineering and Technology Mardan, 23200, Pakistan. Email: skhattak710@gmail.com,, Phone: +92-333-9400571