**Anum Ali** Last updated: Sep. 2022

## CONTACT INFORMATION

6501 Excellence Way,
Plano, TX, USA.

✉ anum.ali@samsung.com
http://www.anumali.com

## WORK EXPERIENCE

**Senior Research Engineer** (Oct. 2019 - present)
Samsung Research America, Plano, TX, USA.
Manager: Dr. Boon Loong Ng
Description: 5G/B5G/6G system design.

**Graduate Research Assistant** (Aug. 2015 - Oct. 2019)
The University of Texas at Austin, TX, USA.
Supervisors: Prof. Robert W. Heath Jr., and Prof. Nuria González-prelcic
Description: Using out-of-band information for mmWave communications.

**Graduate Technical Intern** (Jun. 2018 - Aug. 2018)
Nokia Bell Labs, Naperville, IL, USA.
Supervisor: Dr. Amitava Ghosh
Description: 5G V2X Design.

**Visiting Research Scholar** (Nov. 2017 - Jan. 2018)
Aalborg Univeristy, Aalborg, Denmark.
Supervisor: Prof. Elisabeth De Carvalho, and Prof. Petar Popovski.
Description: Design and analysis of spatially non-stationary massive MIMO systems.

**Graduate Technical Intern** (May 2017 - Aug. 2017)
Qualcomm R&D, Bridgewater, NJ, USA.
Supervisor: Dr. Shailesh Patil
Description: V2V communication for autonomous vehicles.

**Graduate Technical Intern** (May 2016 - Aug. 2016)
Intel Labs, Santa Clara, CA, USA.
Supervisor: Dr. Nageen Himayat.
Description: MmWave system design.

**Research Engineer** (Jul. 2014 - Jul. 2015)
King Abdullah University of Science and Technology, Thuwal, Saudi Arabia.
Supervisor: Prof. Tareq Y. Al-Naffouri.
Description: PAPR reduction in OFDM, and narrowband interference mitigation in SC-FDMA.

**Research Associate** (Aug. 2011 - Sep. 2012)
COMSATS University Islamabad (CUI), Islamabad, Pakistan.
Supervisor: Prof. Shafayat Abrar.
Description: Design, application and analysis of blind adaptive algorithms based on minimum entropy deconvolution principle.

## EDUCATION

**Ph.D. in Electrical Engineering** (Aug. 2015 - Sep. 2019)
The University of Texas at Austin, TX, USA.
Advisors: Prof. Robert W. Heath Jr., and Prof. Nuria González-prelcic.
Dissertation: Millimeter Wave Link Configuration Using Out-Of-Band Information

**M.S. in Electrical Engineering** (Sep. 2012 - May 2014)
King Fahd University of Petroleum and Minerals (KFUPM), Dhahran, Saudi Arabia.
Advisors: Prof. Tareq Y. Al-Naffouri, and Prof. Oualid Hammi.

Dissertation: On Compensating the OFDM Physical Layer Impairments Using Compressive Sensing.

**B.S. in Electrical Engineering** (Aug. 2007 - Jul. 2011)
COMSATS University Islamabad (CUI), Pakistan.

**JOURNAL PUBLICATIONS**

[20] **A. Ali**, P. Parida, V. Va, S. Ni, K. N. Nguyen, B. L. Ng, and J. C. Zhang, "End-to-End Dynamic Gesture Recognition Using MmWave Radar", *IEEE Access*, vol. 10, pp., 88692-88706, Aug. 2022.

[19] **A. Ali**, M. Moinuddin, and T. Y. Al-Naffouri, "NLMS Is More Robust to Input-Correlation Than LMS: A Proof", *IEEE Signal Process. Lett. early access*, 2021.

[18] Y. Heng, J. G. Andrews, J. Mo, V. Va, **A. Ali**, B. L. Ng, and J. C. Zhang, "Six Key Challenges for Beam Management in 5.5 G and 6G Systems", *IEEE Commun. Mag.*, vol. 59, no. 07, pp. 74-79, 2021.

[17] **A. Ali**, J. Mo, B. L. Ng, V. Va and J. C. Zhang, "Orientation-Assisted Beam Management for Beyond 5G Systems", *IEEE Access*, vol. 9, pp. 51832-51846, 2021.

[16] **A. Ali**, M. Moinuddin, and T. Y. Al-Naffouri, "The NLMS is Steady-State Schur-Convex", *IEEE Signal Process. Lett.*, vol. 28, pp. 389-393, 2021.

[15] **A. Ali**, N. G.-Prelcic, and A. Ghosh, "Passive Radar at the Roadside Unit to Configure Millimeter Wave Vehicle-to-Infrastructure Links", *IEEE Trans. Veh. Tech.*, early access.

[14] E. De Carvalho, **A. Ali**, A. Amiri, M. Angjelichinoski, and R. W. Heath Jr., "Non-Stationarities in Extra-Large Scale Massive MIMO", *IEEE Wireless Commun.*, vol. 27, no. 4, pp. 74-80, August 2020.

[13] **A. Ali**, N. G.-Prelcic, and A. Ghosh, and R. W. Heath Jr., "Leveraging Sensing at the Infrastructure for mmWave Communication", *IEEE Commun. Mag.*, vol. 58, no. 7, pp. 84-89, July 2020.

[12] S. Park, **A. Ali**, N. G.-Prelcic, and R. W. Heath Jr., "Spatial Channel Covariance Estimation for Hybrid Architectures Based on Tensor Decompositions", *IEEE Trans. Wireless Commun.*, vol. 19, no. 02, pp. 1084-1097, 2020.

[11] **A. Ali**, N. G.-Prelcic, and R. W. Heath Jr., "Spatial Covariance Estimation for Millimeter Wave Hybrid Systems Using Out-of-Band Information", *IEEE Trans. Wireless Commun.*, vol. 18, no. 12, pp. 5471-5485, 2019.

[10] **A. Ali**, E. De Carvalho, and R. W. Heath Jr., "Linear Receivers in Non-stationary Massive MIMO Channels with Visibility Regions ", *IEEE Wireless Commun. Lett.*, vol. 8, no. 3, pp. 885-888, 2019.

[9] **A. Ali**, N. G.-Prelcic, and R. W. Heath Jr., "Millimeter Wave Beam-Selection Using Out-of-Band Spatial Information", *IEEE Trans. Wireless Commun*, vol. 17, no. 2, pp. 1038-1052, 2018.

[8] N. G.-Prelcic, **A. Ali**, V. Va, and R. W. Heath Jr., "Millimeter Wave communication with out-of-band information", *IEEE Commun. Mag.*, vol. 55, no. 12, pp. 140-146, 2017.

[7] **A. Ali**, M. Masood, M. S. Sohail, S. Al-Ghadhban and T. Y. Al-Naffouri, "Narrowband Interference Mitigation in SC-FDMA Using Bayesian Sparse Recovery", *IEEE Trans. Signal Process.*, vol. 64, no. 24, pp. 6471-6484, 2016.

[6] A. Zaib, M. Masood, **A. Ali**, W. Xu, and T. Y. Al-Naffouri, "Distributed Channel Estimation and Pilot Contamination Analysis for Massive MIMO-OFDM System", *IEEE Trans. Commun.*, vol. 64, no. 11, pp. 4607-4621, 2016.

[5] **A. Ali**, A. Al-Rabah, M. Masood and T. Y. Al-Naffouri, "Receiver-based Recovery of Clipped OFDM Signals for PAPR Reduction: A Bayesian Approach", *IEEE Access*, vol. 2, pp. 1213-1224, Oct. 2014.

[4] **A. Ali**, S. Abrar, A. Zerguine and A. K. Nandi, "Newton-like minimum entropy equalization algorithm for APSK systems", *Signal Process.*, vol. 101, pp. 74-86, Aug. 2014.

[3] D. S. Owodunni, **A. Ali**, A. A. Quadeer, E. B. Al-Safadi, O. Hammi and T. Y. Al-Naffouri, "Compressed Sensing Techniques for Receiver based Post-Compensation of Transmitter's Nonlinear Distortions in OFDM Systems", *Signal Process.*, vol. 97, pp. 282-293, Apr. 2014.

[2] **A. Ali**, O. Hammi and T. Y. Al-Naffouri, "Compressed Sensing based Joint-Compensation of Power Amplifier's Distortions in OFDMA Cognitive Radio Systems", *IEEE J. Emerg. Sel. Topics Circuits Syst.*, vol. 3, no. 4, pp. 508-520, Dec. 2013.

[1] S. Abrar, **A. Ali**, A. Zerguine and A. K. Nandi, "Tracking Performance of Two Constant Modulus Equalizers", *IEEE Commun. Lett.*, vol. 17, no. 5, pp. 830-833, May 2013.

**CONFERENCE PUBLICATIONS**

[19] Khuong Nhat Nguyen, Anum Ali, Jianhua Mo, Boon Loong Ng, Vutha Va, and Jianzhong Charlie Zhang, "Beam Management with Orientation and RSRP using Deep Learning for Beyond 5G Systems", in *Proc. IEEE Int. Conf. Commun. Wksp. (ICCW)*, 2022.

[18] J. Mo, D. Park, B. L. Ng, V. Va, **A. Ali**, C. Seo, and J. C. Zhang, "Sub-Chain Beam for mmWave Devices: A Trade-off between Power Saving and Beam Correspondence", *in in Proceedings of the Asilomar Conference on Signals, Systems, and Computers.*, 2021.

[17] A. Graff, **A. Ali**, N. G.-Prelcic and A. Ghosh, "Automotive Radar and MmWave MIMO V2X Communications: Interference or Fruitful Coexistence", *in Proc. IEEE Radar Conf.*, 2020.

[16] A. Graff, **A. Ali**, N. G.-Prelcic and A. Ghosh, "Sub-Chain Beam for mmWave Devices: A Trade-off between Power Saving and Beam Correspondence", *in in Proceedings of the Asilomar Conference on Signals, Systems, and Computers.*, 2020.

[15] A. Graff, **A. Ali**, N. G.-Prelcic and A. Ghosh, "Automotive Radar and MmWave MIMO V2X Communications: Interference or Fruitful Coexistence", *in Proc. IEEE Radar Conf.*, 2020.

[14] W. Zheng, **A. Ali**, N. G.-Prelcic, R. W. Heath Jr., A. Klateau, E. M. Pari, "5G V2X communication at millimeter wave: rate maps and use cases", *in Proc. IEEE Veh. Tech. Conf. (VTC)*, Spring 2020.

[13] A. Graff, **A. Ali**, and N. G.-Prelcic, "Measuring radar and communication congruence at millimeter wave frequencies", *in Proc. IEEE Proc. Asilomar Conf. Signals, Syst. Comput. (ASILOMAR)*, 2019.

[12] **A. Ali**, N. G.-Prelcic, and A. Ghosh, "Automotive radar radiations as signals of opportunity for millimeter wave V2I links", *in Proc. IEEE Proc. Asilomar Conf. Signals, Syst. Comput. (ASILOMAR)*, 2019.

[11] **A. Ali**, N. G.-Prelcic, and A. Ghosh, "Millimeter wave V2I beam-training using base-station mounted radar", *in Proc. IEEE Radar Conf.*, 2019.

[10] S. Park, **A. Ali**, N. G.-Prelcic, and R. W. Heath Jr., "Spatial channel covariance estimation for the hybrid architecture at a base station: a tensor-decomposition-based approach", *in Proc. IEEE Global Conf. on Signal and Info. Process (GlobalSIP)*, 2018.

[9] **A. Ali**, L. Jiang, S. Patil, J. Li, and R. W. Heath Jr., "Vehicle-to-Vehicle Communication for Autonomous Vehicles: Safety and Maneuver Planning", *in Proc. IEEE Veh. Tech. Conf. (VTC)*, Fall 2018.

[8] **A. Ali**, and R. W. Heath Jr., "Compressed Beam-Selection in Millimeter Wave Systems With Out-of-Band Partial Support Information", *in Proc. IEEE Int. Conf. Acoust. Speech Signal Process. (ICASSP)*, 2017.

[7] **A. Ali**, N. G.-Prelcic, and R. W. Heath Jr., "Estimating Millimeter Wave Channels using Out-of-Band Measurements", *in Proc. Inf. Theory Appl. (ITA) Wksp*, 2016.

[6] S. Al-Shuhail, **A. Ali**, and T. Y. Al-Naffouri, "Peak-to-average power ratio reduction in interleaved OFDMA systems", *in Proc. IEEE Int. Symp. Signal Process. Info. Tech. (ISSPIT)*, 2015.

[5] **A. Ali**, H. ElSawy, T. Y. Al-Naffouri, and M.-S. Alouini "Narrowband Interference Parameterization for Sparse Bayesian Recovery", in *Proc. IEEE Int. Conf. Commun. (ICC)*, 2015.

[4] **A. Ali**, M. Masood, S. Al-Ghadhban and T. Y. Al-Naffouri, "Bayesian Narrowband Interference Mitigation in SC-FDMA", in *Proc. IEEE Int. Conf. Acoust. Speech Signal Process. (ICASSP)*, 2015.

[3] **A. Ali**, A. Al-Zahrani, T. Y. Al-Naffouri, "Receiver Based PAPR Reduction in OFDMA", in *Proc. IEEE Int. Conf. Acoust. Speech Signal Process. (ICASSP)*, 2014.

[2] A. Al-Rabah , M. Masood, **A. Ali** and T. Y. Al-Naffouri, "Receiver-Based Bayesian PAPR Reduction in OFDM", in *Proc. Eur. Sign. Proc. Conf. (EUSIPCO)*, 2013.

[1] **A. Ali** and S. Abrar, "Adaptive Minimum Entropy Beamforming Algorithms for Narrowband Signals", in *proc. Emerg. Trends Appl. Inf. Commun. Technol. (IMTIC)*, pp. 62-72, Springer Berlin Heidelberg, 2012.

## SELECTED PATENTS

Three granted patents and and more than fifteen patent applications. Two granted patents below.

[2] S. Singh, **A. Ali**, J. Zhu, N. Himayat, and C. Yiu, "Cell selection techniques for directional communications", *US Patent 10,849,042*.

[1] **A. Ali**, D. S. Owodunni, O. Hammi, and T. Y. Al-Naffouri, "System and method for joint compensation of power amplifier's distortions", *US Patent 9,137,082*.

## TECHNICAL REPORTS

[2] T. Y. Al-Naffouri, M. Moinuddin, and **A. Ali**, "Mean-square Analysis of the NLMS Algorithm", *arXiv:2108.03721*.

[1] E. B. Al-Safadi, T. Y. Al-Naffouri, M. Masood and **A. Ali**, "Nonlinear Distortion Reduction in OFDM from Reliable Perturbations in Data Carriers", *arXiv:1506.09060v1*.

## TEACHING EXPERIENCE

**Lab Instructor and Grader**

COMSATS University Islamabad (CUI), Islamabad, Pakistan.

- Microprocessor Systems and Interfacing. (Spring 2012)
- Electronics-I, and Electric Circuit Analysis-I. (Fall 2011)

**Teaching Assitant**

The University of Texas at Austin, Austin, TX, USA.

Wireless Communications Lab (Fall 2016)

King Abdullah University of Science and Technology, Thuwal, Saudi Arabia.

Digital Communication I (Fall 2013, Fall 2014)

Compressive Sensing (Spring 2014)

## PROFESSIONAL SERVICE

**Referee Service**

*IEEE Transactions on Signal Processing, IEEE Transactions on Wireless Communications, IEEE Transactions on Communications, IEEE Journal on Selected Areas in Communications, IEEE Transactions on Vehicular Technology, IEEE Access, IEEE Communication Letters, IEEE Wireless Communication Letters, IEEE Communications Magazine, and Signal Processing.*

## INVITED TALKS

[1] "Millimeter Wave Link Configuration Using Out-Of-Band Information", given in Mitsubishi Electric Research Laboratories (MERL), Cambridge, MA, Apr. 2019.

## PROFESSIONAL MEMBERSHIPS

**Senior Member**, Institute for Electrical and Electronics Engineers (IEEE) (since 2012)

IEEE Signal Processing Society (since 2014)

IEEE Communications Society (since 2015)

IEEE Vehicular Technology Society (since 2018)

## SKILLS

**Programming Languages**

MATLAB, Python, C++.

**Applications**

LaTeX, GitHub, HTML.