Muhammad Sajjad Khan (Ph.D.)

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Room no. 103, Jeongwang-dong 1588-4, South Korea.

Personal Statement

A committed, responsible, and adaptable research fellow with an impressive track record of scientific publications, seeking a research position. Experience of dealing with multiple tasks, meeting deadlines by prioritizing tasks, and able to work with minimal supervision. Hands on experience with remote and direct research collaborations along with supervision of juniors and teamwork with colleagues and seniors in a friendly environment.

Education

- **Ph.D. Electrical Engineering** *(Sep. 2012 to Nov. 2016)*
  University of Ulsan, South Korea
  - ***Thesis Title:*** "An Enhancement of Cooperative Spectrum Sensing and Sharing in Cognitive Radio Networks"
  - ***Supervisor:*** Prof. Insoo Koo
- **M.S. Telecom & Control Engineering** *(Jan. 2005 to Nov. 2007)*
  Mehran University of Engineering & Technology, Jamshoro, Pakistan
  - ***Thesis Title:*** "Minimization of Noise on OFDM"
  - ***Supervisor:*** Prof. Mukhtiar
- **PGD in Human Resource Management***(Feb.2008to Feb. 2009)*
  Bahauddin Zakriya University Multan, Pakistan
  - ***Major:*** "Human Resource Management"
- **B.S. Computer Information Systems Engineering** *(Feb. 2000 to Feb. 2004)*
  NWFP University of Engineering & Technology, Peshawar, Pakistan
  - ***FYP Title:*** "Controlling Home Appliances through Phone"
  - ***Supervisor:*** Engr. Behroz Shehzad

Professional Experience

- **Postdoctoral Fellow/ Research Professor:** *(Dec.2018~Present)*
  ICT Convergence Smart Engineering Research Center, Korea Polytechnic University, S. Korea.
  - ***Research Area:*** IoT, Malicious Users in Cognitive Radio, Machine Learning Algorithm, Cooperative Communication, Next Generation Network.

Research Interests

- Internet of Things (IoT)
- Radio Resource Management
- Machine Learning Algorithm
- Cloud Computing
- Edge/Fog Computing
- Next Generation Wireless Network

Software tools and Languages

- MATLAB
- Latex
- C/C++
- Cloudsim
- MS VISIO
- JAVA

Spoken Languages

Pashto	Native
Urdu	Native
English	IELTS
Korean	TOPIK 2

Professional Training

- Outcome Base Education (OBE) System

Volunteer Reviewing Services

- Transaction on Internet Technology
- IEEE Communication Letters
- KSII Transaction on Internet and Information Systems
- Computer Standards & Interface
- Journal of Information Security and Applications

❖ **Assistant Professor** *(Jun. 2011~Present)*

Department of Electrical Engineering, International Islamic University, Islamabad, Pakistan.

- ***Responsivities:*** Teaching & Research, In charge OBE Committee, In charge FYP Committee.

❖ **Research Scholar:** *(Sep.2012~ Nov. 2016)*

Multimedia Communications Systems Lab, University of Ulsan, S. Korea.

- ***Responsibilities:*** Spectrum Sensing and Resource Utilization, Design and Implementation, Lab. Manager.

❖ **Assistant Professor** *(Aug.2008~ Jun. 2011)*

NFC IET Multan Pakistan

- ***Responsibilities:*** Teaching and Research, Networking Management, In-charge FYP.

❖ **System Engineer (Lec.)** *(Jun.2006~ Jul. 2008)*

NFC IET Multan Pakistan

- ***Responsibilities:*** Teaching and Research, Networking Management, In-charge FYP.
- ***Responsibilities:*** Spectrum Sensing and Resource Utilization, Design and Implementation, Lab. Manager.

❖ **Deputy Director/Principal** *(Apr.2004~ May 2006)*

Chakdara Polytechnic Institute, Chakdara, Pakistan

- ***Responsibilities:*** Managing Institute, Head of Faculties, Teaching and Research, Head of Recruitment Department.

❖ Honors and Award

- ***Ph.D:*** Ulsan International Graduate Scholarship (University of Ulsan S. Korea), BK21+
- ***B.S:*** Got Merit Scholarship in UET Peshawar (Undergraduate studies).
- Got 10th Position in Board in HSSC.
- Got 2nd Position in SSC in School.

Published Peer-Reviewed Journal Articles (SCI/SCIE)

1. **Muhammad Sajjad Khan**, Liaqat Khan, Noor Gul, Muhammad Amir, Junsu Kim, Su Min Kim, "Support Vector Machine Based Classification of Malicious users in Cognitive Radio Networks," **Wireless Communications & Mobile Computing**, Vol. 2020, Article ID: 8846948, **Jul. 2020.** (IF: 1.819) SCIE
2. Noor Gul, **Muhammad Sajjad Khan**, Junsu Kim, Su Min Kim, "Robust Spectrum Sensing via Double Sided Neighbor Distance Based Genetic Algorithm in Cognitive Radio Networks," **Mobile Information Systems**, Vol. 2020, Article ID: 8876824, **Jul. 2020.** (IF: 1.508) SCIE
3. Noor Gul, **Muhammad Sajjad Khan**, Junsu Kim, Su Min Kim, Atif Elahi, Zafar Khalil, "Boosted Trees Algorithm as Reliable Spectrum Sensing Scheme in the Presence of Malicious Users," **MDPI Electronics,** DOI: 10.3390/electronics9061038, Vol.9, No.6, pp.1-23, **June 2020.** (IF: 2.412) SCIE
4. Ihsan Ullah, **Muhammad Sajjad Khan,** Muhammad Amir, Junsu Kim, Su Min Kim, "LSTPD: Least Slack Time-based Preemptive Deadline Constraint Scheduler for Hadoop Cluster**," IEEE Access,** DOI:10.1109/ACCESS.2020.3002565, Vol.8, pp.111751-111762, **June 2020.** (IF: 4.640) SCIE

5. Noor Gul, Ijaz Mansoor Qureshi, **Muhammad Sajjad Khan,** Atif Elahi, Sadiq Akbar, "Differential Evolution based Reliable Cooperative Spectrum Sensing in the Presence of Malicious Users," **Wireless Personal Communications**, DOI: 10.1007/S11277-020-07354-7, **Apr. 2020.** (IF: 1.20) SCIE
6. **Muhammad Sajjad Khan,** Noor Gul, Junsu Kim, I. M. Qureshi, Su Min Kim, "A Genetic Algorithm-based Soft Decision Fusion Scheme in Cognitive IoT Networks with Malicious Users," **Wireless Communication & Mobile Computing**, Vol. 2020, Article ID: 2509081, **Jan. 2020.** (IF: 1.819) SCIE
7. **Muhammad Sajjad Khan,** Muhammad Jibran, Insoo Koo, Su Min Kim, Junsu Kim, "A Double Adaptive Approach in Cognitive Radio Networks to Tackle Malicious User," **Wireless Communications & Mobile Computing**, Vol. 2019, Article ID: 2350694, **Mar.2019**. (IF: 1.819) SCIE
8. **Muhammad Sajjad Khan**, Junsu Kim, Eung Hyuk Lee, Su Min Kim, "An Efficient Contention-window based Reporting for Internet of Things Features in Cognitive Radio Networks," **Wireless Communications & Mobile Computing**, Vol.2019, Article ID:8475020, **Aug. 2019**. (IF: 1.819) SCIE
9. **Muhammad Sajjad Khan**, Muhammad Usman, Insoo Koo, "Dynamic Spectrum Tracking through Quickest Detection Technique: A Clustered Approach**," Journal of Internet Technology**, Vol.19, No. 5, pp. 1363-1370, **Sep. 2018.** (IF:0.786) SCIE
10. Atif Elahi, Ijaz Mansoor Qureshi, Noor Gul, **Muhammad Sajjad Khan**, Hayat Ullah, "A Nature-Inspired Hybrid Technique for Interference Reduction in Cognitive Radio Networks," **Springer Cognitive Computation**, DOI: 10.1007/s12559-018-9560-2, **May 2018**, (IF:4.980) SCIE
11. **Muhammad Sajjad Khan**, Muhammad Usman, Vu-Van Hiep, Insoo Koo, "Efficient Selection of Users' pair in Cognitive Radio Network to Maximize Throughput using Simultaneous Transmit-Sense Approach," **IEICE Transaction on Communication**, Vol. E-100B, No. 2, pp. 380-389, **Feb. 2017**. (IF:0.614) SCIE
12. Noor Gul, I. M. Qureshi, A. Umar, A. Elahi, **Muhammad Sajjad Khan**, "History Based Forward and Backward Mechanism in Cooperative Spectrum Sensing including Malicious Users in Cognitive Radio Network," **PLoS ONE** 12(8): e0183387 · **Aug. 2017.** (IF:2.740) SCIE
13. Muhammad Usman, **Muhammad Sajjad Khan**, Vu-Van Hiep, Insoo Koo, "Energy-Efficient Channel Handoff for Sensor Network-Assisted Energy Harvesting Cognitive Radio Network," **MDPI Sensors**, 15(8), 18012-18039; doi:10.3390/s150818012, **Aug. 2015.** (IF:3.275) SCIE
14. **Muhammad Sajjad Khan**, Insoo Koo, "The Effect of Multiple energy detector on Evidence theory based Cooperative Spectrum Sensing for Cognitive Radio Networks," **Journal of Information Processing Systems**, Vol.12, No.2, pp.295-309.doi: 10.3745/JIPS.03.0040, **2016.** (SJR IF:0.265) ESCI.
15. **Muhammad Sajjad Khan,** Insoo Koo, "Mitigation of Adverse Effects of Malicious Users on Cooperative Spectrum Sensing by Using Hausdorff Distance in Cognitive Radio Networks," **Journal of Information and Communication Convergence Engineering (JICCE),** Vol.13, No.2, pp.74-80, **June 2015**. KCI, Scopus.
16. **Muhammad Sajjad Khan**, Insoo Koo, "Performance Analysis of Amplify and Forward (AF) Based Cooperative Spectrum Sensing in Cognitive Radio Network", **Journal of Information and communication convergence engineering (JICCE),** Vol.11, No.4, pp.223-228, **Dec. 2013.** KCI, Scopus**.**

Under Review Journal Articles (SCI/SCIE)

17. Noor Gul, **Muhammad Sajjad Khan,** Su Min Kim, Junsu Kim, " Particle Swarm Optimization in the Presence of Malicious Users in Cognitive IoT Networks with Data," Scientific Programming,2020.

18. Ihsan Ullah, **Muhammad Sajjad Khan**, Marc St-Hilaire, Junsu Kim, Su Min Kim, "Task Priority-Based Cached Data Prefetch and Eviction in Edge Computing Clusters," (Submitted to MDPI Sensor, 2020).

19. Arshed Ahmed, **Muhammad Sajjad Khan,** Noor Gul, Junsu Kim, Su Min Kim, "A Comparative Analysis of Different Outlier Detection Techniques in Cognitive Radio Networks with Malicious Users" (Submitted to Wireless Communications & Mobile Computing, 2020).

20. Rashed Ahmed, **Muhammad Sajjad Khan**, Noor Gul, Atif Elahi, Junsu Kim, Su Min Kim, "Interference Minimization in Cognitive Radio Network Using Differential Evolution Based Modified Generalized Side lobe Canceller," (Submitted to IEEE Access, 2020).

21. Noor Gul, Atif Elahi, **Muhammad Sajjad Khan**, I. M. Qureshi, Imtiaz Rasool, "Malicious Users Prevention in a Hard Fusion Scheme using Statistical Features in Cooperative Spectrum Sensing," (review-submitted KSII Transactions on Internet and Information Systems, 2020).

Book Chapter

21. **Muhammad Sajjad Khan**, Insoo Koo, "An Enhanced Cooperative Spectrum Sensing based on New Rule of Combining Evidences in Cognitive Radio," Lecture Notes in Electrical Engineering, UCAWS, Springer, Vol.331, Book ISBN:978-94-017-0, **2015**. (Scopus)

International Peer-Reviewed Conference Papers/ (Scopus)

1. Muhammad Usman, **Muhammad Sajjad Khan**, and Insoo Koo, "A Robust Cooperative Spectrum Sensing Based on Non-uniform Reliability for Cognitive Radio Networks", ISAAC 2013/ICACT2013, AACL 01, PP.93-96, **2013**.

2. **Muhammad Sajjad Khan**, Insoo Koo, " An Evidence Theory-based Cooperative Sensing for Cognitive Radio using Multiple Energy Detector," 2nd FTRA International Conference on Ubiquitous Computing application and Wireless Sensor Network (UCAWSN-14), p21, Jeju, Korea, 7-10 July **2014**.

3. Md. Tahidul Islam, **Muhammad Sajjad Khan**, Insoo Koo, "SIMO-Based Coarse Fine Sensing Scheme for Wideband Cognitive Radio Communication," International Conference on Electrical & Electronics Engineering (ICEEE'2015), Nov.**2015**.

4. Md. Tahidul Islam, **Muhammad Sajjad Khan**, Insoo Koo, "Evidence Theory-Based Cooperative Spectrum Sensing in Multi Antenna Cognitive Radio System," IEEE 2nd International Conference on Electrical Information and Communication Technology (EICT'2015), pp. 278-283, Dec. **2015**.

5. **Muhammad Sajjad Khan**, Muhammad Usman, Insoo Koo, "Quickest Detection of Primary Signal in Cognitive Radio Network: A Clustered Approach," The 2016 World Congress on Information Technology Application and Services, World IT Congress 2016 Jeju, 17-19 Feb. **2016**.

6. **Muhammad Sajjad Khan**, Insoo Koo, "Primary User Detection in Cognitive Radio Network through Quickest Detection," IEEE C-CODE. 2017 Islamabad, 8-9 Mar**. 2017**.

7. **Muhammad Sajjad Khan**, Insoo Koo, "Malicious User Mitigation Based on Similarity Based Correlation Sensing Scheme in Cognitive Radio Network," IFOST 2017 Ulsan, 31-02 June **2017**.

8. Khurram Khalil, **Muhammad Sajjad Khan**, "Futiling Eavesdropping in Harvested Energy Powered Cognitive Radio Networks under Secrecy Constraints and Multi Slot Spectrum Sensing Schedule," iCoMET 20118, Sukkar IBA, 3-4 March **2018**.

9. **Muhammad Sajjad Khan**, Junsu Kim, Eung Hyuk Lee, Su Min Kim, "Reputation Based Sequential Sensing in Cognitive Radio Networks," 29th Joint Conference on Communication and Information (JCCI2019), Gangneung, Korea, 1-3 May **2019.**

10. **Muhammad Sajjad Khan**, Su Min Kim, Eung Hyuk Lee, Junsu Kim, "Contention Window Based Sequential Reporting in Cognitive Radio Networks," IEEK, IEIE, Jeju, Korea, 26-28 Jun. **2019**.

11. **Muhammad Sajjad Khan**, Mi Ji Kim, Junsu Kim, Eung Hyuk Lee, Su Min Kim, "Improving Spectrum Sensing and Reporting via Multi-Antenna in Cognitive Radio Networks," The 11th International Conference on Ubiquitous and Future Network (ICUFN 2019) Zagreb, Croatia, 2-5 July **2019**.

12. **Muhammad Sajjad Khan**, Su Min Kim, Eung Hyuk Lee, Junsu Kim, "A Contention window-based Approach for Reporting Sensing," IEEE 1st International Conference on Electrical, Communication and Computer Engineering (ICECCE-2019), Swat, Pakistan, 24-25 July **2019**.

13. **Muhammad Sajjad Khan**, Su Min Kim, Eung Hyuk Lee, Junsu Kim, "Genetic Algorithm Based Cooperative Spectrum Sensing Optimization in the Presence of Malicious Users in Cognitive Radio Networks," The 10th International Conference on ICT Convergence (ICTC 2019), Jeju, Korea, 16-18 Oct. **2019**.

14. **Muhammad Sajjad Khan**, Junsu Kim, Eung Hyuk Lee, Su Min Kim, "A Received Signal Strength Based Localization Approach for Multiple Target Nodes via Bayesian Compressive Sensing," The 22nd IEEE International Multi Topic Conference (INMIC 2019), Islamabad, Pakistan, 29-30 Nov. **2019**.

15. **Muhammad Sajjad Khan**, Junsu Kim, Eung Hyuk Lee, Su Min Kim, "Particle Swarm Optimization based Cooperative Spectrum Sensing in Cognitive Radio Networks with Malicious Users," KICS Winter Conference 2020, Pyeongchang, Korea, 5-7 Feb. **2020**.

16. **Muhammad Sajjad khan**, Junsu Kim, Eung Hyuk Lee, Su Min Kim, " A Malicious User Filtration via Double Sided Neighbor Distance Based Genetic Algorithm in Cognitive Radio networks, KICS Summer Conference, Pyeongchang, S. Korea, 12-14 Aug. **2020**.

17. **Muhammad Sajjad khan**, Junsu Kim, Eung Hyuk Lee, Su Min Kim, "Malicious Users Stratification via Support Vector Machine in Cognitive Radio Network," KIEES, Jeju, S. Korea, 19-22 Aug. **2020.**

18. **Muhammad Sajjad Khan**, Liaqat Khan, Junsu Kim, Eung Hyuk Lee, Su Min Kim, "Cognitive User Selection Based on Throughput Estimation in Cognitive Radio Network," 11th International Conference on ICT Convergence ICTC 2020, Jeju, S. Korea, 21-23 Oct. **2020**.

19. **Muhammad Sajjad Khan**, Junsu Kim, Eung Hyuk Lee, Su Min Kim, "Bulwarking Cooperative Spectrum Sensing via Particle Swarm Optimization in Cognitive Radio Networks with Malicious Users," 23rd IEEE International Multi Topic Conference (INMIC 2020), Bahawalpur, Pakistan, 5-7 Nov**. 2020**.

Patent

1. Method for Cooperative Spectrum Optimization using Genetic Algorithm, South Korean Patent 10-2019-0156096.

Administrative and Supervision Experience

- ✧ Writing project progress reports
- ✧ Co-supervision of 2 M.S students in Korea Polytechnic University, S. Korea
- ✧ Supervise 5 Final Year Project
- ✧ OBE based system in-charge
- ✧ FYP Under-graduate in-charge

Personal Details

- ✧ Date of birth January 01, 1981
- ✧ Nationallity Pakistani
- ✧ Marital status Married

Hobbies and Extracurricular Activities

- ✧ Basket ball
- ✧ Cricket
- ✧ Hiking
- ✧ Jogging

References

Professor **Su Min Kim,** Ph.D., Senior IEEE
Associate Professor
Dept. of Electronics Engineering, Korea Polytechnic University, S. Korea
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Professor **Junsu Kim,** Ph.D., Senior IEEE
Associate Professor
Dept. of Electronics Engineering, Korea Polytechnic University, S. Korea
Email: junsukim@kpu.ac.kr

Professor **Insoo Koo,** Ph.D., Senior IEEE
Associate Dean.
School of Electrical Engineering, University of Ulsan, S. Korea
Email: iskoo@ulsan.ac.kr

Professor **Muhammad Amir,** Ph.D., Senior IEEE

Dean
Faculty of Engineering & Technology International Islamic University Islamabad, Pakistan
Email: m.amir@iiu.edu.pk

Statement of Teaching

- Courses Taught at Undergraduate level in international Islamic University Islamabad Pakistan.
  - Wireless Communication
  - Signals and Systems.
  - Computer Networks
  - Fundamental of Programming.
  - Microprocessor and Micro-Controllers
  - Digital Logic Design

- Courses Taught at Undergraduate level in Korea Polytechnic University, S. Korea.
  - Introduction to Modern Electrical Engineering & Science

  Courses Taught at graduate level in Korea Polytechnic University S. Korea.
  - Radio Resource Management.
  - Mobile and Wireless Network.
  - Ad hoc Sensor Network.