Arshad Iqbal

- Address: Iqbal House, Malik Ameer Haider Town, Sir Syed School Chowk, Gulbahar no.3, Peshawar, Khyber Pakhtunkhwa (KPK), Pakistan
- Email: arshad.afridi4u@gmail.com, arshad.iqbal@spcai.paf-iast.edu.pk
- Contact: +923339289566/+923109508192, Skype ID: arshad.afridi4u,

EDUCATION

Sungkyunkwan University (SKKU), Suwon, South Korea, (QS world rank: 88)

- **Ph.D. (and MS combined)** in Electronic and Electrical Engineering — Sep 2015 – Aug 2020
  Specialization: Wireless Communication and Networks, Artificial Intelligence
  Department: Electrical and Computer Engineering
  - Thesis: Access Control and Coordination for Distributed Wireless Powered Communication Networks
  - Adviser: Prof. Tae-Jin Lee
  - Focus: Medium Access Control, Resource Allocation, Internet of Things, WLAN, Sensors Networks, Energy Harvesting Networks, Backscatter Communication Networks, Power Saving, Artificial Intelligence/Machine Learning /Reinforcement Learning, Distributed Communication Networks, Next Generation Communication Networks.

University of Engineering and Technology , Peshawar, Peshawar, Khyber Pakhtunkhwa, Pakistan

- M.Sc. in Computer System Engineering — Feb 2014 – Aug 2015
  - Course Work Completed.
  - Cumulative GPA: 3.59 / 4.00

COMSATS Institute of Information Technology, Abbottabad, Khyber Pakhtunkhwa, Pakistan

- B.S. in Electrical Computer Engineering — Sep 2009 – Jun 2013
  - Cumulative GPA: 3.32 / 4.00

GHSS Sama Badaber, FR Peshawar, Khyber Pakhtunkhwa, Pakistan

- HSSC (F.Sc) Pre-Engineering — Aug 2008
  - Marks: 830 / 1100

GHS Shamshatoo, FR Peshawar, Khyber Pakhtunkhwa, Pakistan

- SSC Science — Jun 2005
  - Marks: 724 / 1080

PROFESSIONAL EXPERIENCE

Assistant Professor, Sino-Pak Center for Artificial Intelligence (SPCAI), — Jan 2021 – Till date

- Pak-Austria Fachhochschule: Institute of Applied Sciences and Technology (PAF-IAST), Khanpur Road, Mang, Haripur, Khyber Pakhtunkhwa.
- Head of Artificial Intelligence Program, Coordinator AI, SPCAI
- Member of Board of Studies (BoS) Machine Learning Department, SPCAI, PAF-IAST
- Leading the Intelligent Field Robotics Lab as the head of the Lab
- Also, associated with Internet of Things (IoT) Lab
- Member of Library Affairs Committee
- Developing and Managing Lenovo High Performance Computing (HPC) GPU cluster for the SPCAI center
- An Active member of industry-academia linkages coordination committee
- Teaching Bachelor of Science (BS) and Master of Science (MS) courses
- Associate Editor, SPCAI News Letter
- Administering Students MS Projects/Thesis

RESEARCH PROJECT EXPERIENCE

Sino-Pak Center For Artificial Intelligence (SPCAI) , PAF-IAST

- Co-Principal Investigator (PI) and Project Coordinator — Sep 2021 – Till date
  - Project Name: “IntelliSurv: An Intelligent Surveillance System for anomaly detection in Real Time Video”, SPCAI, RG-I. Role and Responsibility: Lead the project administratively. Manages the funding of the project. Approves project expenses as lead PI in the host Institute.

Network System LAB, Sungkyunkwan University

- Research Assistant — Mar 2018 – Aug 2020
  - Project: “Multi-functional Integrated Networks for High-performance Long-range Beyond-Backscatter Communications”, National Research Foundation (NRF) of Korea, (No: 2018R1A2B6009348).

- Supervisors: Prof. Tae-Jin Lee
- Focus: Beyond-Backscatter Communication, Backscatter Communication Network, Medium Access Control, Resource Allocation, Internet of Things, Energy Harvesting Networks.
- Partial Contributions: Conference Paper:1, (Serial No: [3]).

▪ Research Assistant Sep 2015 – Aug 2020
- Project: Wireless Energy Harvesting and Communications Research Center," National Research Foundation (NRF) of Korea, (No: 2014R1A5A1011478).
- Supervisors: Prof. Tae-Jin Lee
- Focus: Wireless Energy Harvesting, Medium Access Control, Resource Allocation, Internet of Things, WLAN, Sensors Networks, Energy Harvesting Networks.
- Contributions: Journal Papers:3, (Serial No: [1],[2],[3]), Conference Papers:3, (Serial No: [1],[2],[3]).

▪ Research Assistant Sep 2015 – Jul 2018
- Project: "Multi-layered Networking Protocol for IoT with Ultra-low-power Tags and Dual-mode Readers," National Research Foundation (NRF) of Korea, (No: 2015R1A2A2A01004067).
- Supervisors: Prof. Tae-Jin Lee
- Focus: Computation RFID (CRFID), Medium Access Control, Resource Allocation, Internet of Things, Energy Harvesting Networks.
- Contributions: Conferences Papers: 2, (Serial No.[2], [3]).

▪ Research Assistant Sep 2015 – Aug 2020
- Project: "Center for ICT HRD," BrainKorea21 Plus (BK21+), BK21+: ICT Human Resource Development (HRD) Institute for New value Creation.
- Supervisors: Prof. Tae-Jin Lee
- Focus: Medium Access Control, Resource Allocation, Internet of Things, WLAN, Sensors Networks, Energy Harvesting Networks.

▪ Research Assistant Jan 2016 – Aug 2020
- Project: "SW Convergence Technology for Advanced Human Computer Interaction," (Ministry of Education Science and Technology), (No:NRF-2010-0020210).
- Supervisors: Prof. Tae-Jin Lee
- Focus: Seamless Connectivity, Wireless Energy Harvesting, Medium Access Control, Resource Allocation, Internet of Things, Sensors Networks, Energy Harvesting Networks.
- Contributions: Conference Papers: 1, (Serial No: [1]).

PUBLICATIONS

JOURNALS, [CUM-IF: 19.41]

[1] **A. Iqbal**, Y. Kim, and T.-J. Lee, "Access Mechanism in Wireless Powered Communication Networks with Harvesting Access Point," *IEEE Access*, vol. 6, pp. 37556-37567, Jul 2018. [Online] doi: https://doi.org/10.1109/ACCESS.2018.2851941, (IF: 4.098).

[2] **A. Iqbal**, Y. Kim, and T.-J. Lee, "Learning AP in Wireless Powered Communication Networks," *International Journal of Communication Systems*, vol. 32, no. 14, pp. 1-16, Apr 2019. [Online] doi: https://doi.org/10.1002/dac.4027, (IF: 1.278). [One of the top downloaded Journals among work published b/w Jan. 2018 – Dec. 2019].

[3] **A. Iqbal**, and T.-J. Lee, "GWINs: Group-Based Medium Access for Large-Scale Wireless Powered IoT Networks," *IEEE Access*, vol. 7, pp. 172913-172927, Dec 2019. [Online] doi: https://www.doi.org/10.1109/ACCESS.2019.2956029, (IF: 4.098).

[4] **A. Iqbal**, and T.-J. Lee, "Spatio-Temporal Medium Access Control for Wireless Powered IoT Networks," *IEEE Internet of Things Journal*, vol. 8, no. 19, pp. 14822-14834, Oct., 2021, https://doi.org/10.1109/JIOT.2021.3072038, (IF: 9.936).

[5] **A. Iqbal**, and T.-J. Lee, "Opportunistic Backscatter Communication Protocol Underlying Energy Harvesting IoT Networks," *Under preparation*.

CONFERENCES

[1] **A. Iqbal**, Y. Kim and T.-J. Lee, "Energy Level-based Efficient Wireless Power and Information Transfer in Sensor Networks," in *Proc. of the International Conference on Ubiquitous Information Management and Communication (IMCOM)*, Beppu, Japan, Jan 2017.

[2] Y. Cho, K. M. Kim, **A. Iqbal**, and T.-J. Lee "Efficient Traffic Control Using Hash Function Filter for Massive IoT Computational RFID Communications," in *Proc. of the International Conference on Information Technology (ICIT)*, Singapore, Singapore, Dec 2017.

[3] **A. Iqbal**, and T.-J. Lee, "Communication MAC Protocol for Coexisting Wireless Devices and Backscatter Tags," in *Proc. of the IEEE International Conference on Ubiquitous Information Management and Communication (IMCOM), Taichung, Taiwan, Jan 2020.*

PATENTS (SOUTH KOREA)

[1] Tae Jin Lee, Kwanyoung Moon, **Arshad Iqbal**, (Translation) "Channel Access Method and Device in Wireless Power Communication Network," Registration No.: 10-2165861 (Application No.: 10-2019-0064753), Oct. 7, 2020. [Status: Issued].

[2] Tae Jin Lee, **Arshad Iqbal**, Kyung-min Kim (Translation) "Apparatus and method for determining frame size in a multi-access network environment," R-2021-0078-KR-1, Application No.: 10-2021-0118304. [Status: Applied]

[3] Tae Jin Lee, **Arshad Iqbal**, Kyung-min Kim (Translation) "Group-based data relay and energy transmission methods and systems in a network composed of Internet sensor terminals," [Under preparation].

PATENTS (UNITED STATES (USA))

[1] Tae Jin Lee, Kwanyoung Moon, **Arshad Iqbal**, "Methods and Apparatuses for Accessing Channel in Wireless Powered Communication Network," US2020-800298, USA, Feb. 25, 2020. [Status: Applied]

[2] Tae-Jin Lee, **Arshad Iqbal**, Kyung-min Kim, "Apparatus and method for determining frame size in a multi-access network environment," [Status: Under Preparation].

PROFESSIONAL AFFILIATIONS & ACTIVITIES

HEC Approved Supervisor,
- Ms and PhD Approved Supervisor — 2021 – Present

Member, IEEE,
Member no : 96100380
- Member IEEE (Islamabad Section) — 2021 – Present

Pakistan Engineering Council,
Registration no: ELECT/3xxx6
- Registered Engineer — 2014 – Present

Korean Researcher Information (KRI),
Registration no: 11XXXX21
- Registered Researcher — 2015 – Present

IEEE (Student) Membership,
Member no : 96100380
- Student Member IEEE (Seoul Section) — 2019 – 2021

RESEARCH COMMUNITY SERVICES

Reviews Papers for some of the notable Journals and conferences
- IEEE Transactions on Vehicular Technology, IEEE Access, etc.
- International Workshop on Artificial Intelligence for Clean, Affordable and Reliable Energy Supply (AI-CARES), DeXA Conference etc.
- 2021 International Conference on Computing, Electronic and Electrical Engineering (ICE Cube)
- ISM 2021 (International Conference on Industry 4.0 and Smart Manufacturing)

CONFERENCES RESPONSIBITIES

- **AI-CARES 2021: Program Committee Member**
- International Workshop on Artificial Intelligence for Clean, Affordable and Reliable Energy Supply (AI-CARES), DeXA Conference, 2021
- Virtually hosted from Johannes Kepler university Linz, Austria Linz, Austria, September 30, 2021
- http://www.dexa.org/ai-cares2021

TEACHING EXPERIENCE

- **BS and MS Courses**
  - Advanced Machine Learning , Fall 2021

- Object Oriented Programming, Spring 2021

- **Outcome Based Education (OBE)**
  - Preparing syllabus for courses and Lab based on OBE

COURSE WORK (PH.D.)

- **Major Courses Category: Wireless Communication and networks**

(i) Advanced Digital Communication, (ii) Advanced Computer Networks, (iii) Mobile Communications, (iv) Mobile Computing,

- **Major Courses Category: Machine Learning and Artificial Intelligence**

(i) Advanced Artificial Intelligence, (ii) Machine Learning, (iii) Neural Networks

- **Major Courses Category: Probability Theory and Performance Evaluation**

(i) Advanced Probability and Random Process, (ii) Advanced Topics on Performance Evaluation, (iii) Optimization Methods, (iv) Advanced Computer Vision, (v) Genetic Algorithms

- **Major Courses Category: Information and Coding Theory**

(i) Advanced Information Theory, (ii) Error Correction Coding Theory

- **Major Courses Category: System and Security Engineering, Technical Writing and Others**

(i) Electric Energy System Engineering, (ii) Security Engineering, (iii) Real Time Systems, (iv) Writing of IT Technical Papers, (v) Seminar in Information Technology

SEMESTER COURSE PROJECTES (PH.D.)

Projects Experienced in Various Courses (Ph.D.),

- Active IoT node selection using Genetic algorithm to provide energy efficiently (A research report), Genetic Algorithm Course Project.
- Develop a web server that handles one HTTP request at a time, Advance Computer Networks Course Project.
- Energy Threshold based Classification and Throughput Performance of Wireless Power Communication Networks, Performance Evaluation Course Project.
- Machine Learning for Communication Systems and Networks; A survey (A research report), Neural Networks Course Project.
- Performance Enhancement in FSA based Relay-Network System by Utilizing Network Coding, Error Correction Coding Course Project.
- Profile Abstraction Layer for IoT Based on KNN and PCA, Security Engineering Course Project.

PROFESSIONAL CERTIFICATES

Cisco Certified Network Associate (CCNA) Routing and Switching — Mar 2015

- Cisco ID: CSCO12740255

Machine Learning — Aug 2016

- Stanford | Live: Offered Through Coursera
- Verify at coursera.org/verify/BCQZMCZEARSV

AWARDS & SCHOLARSHIPS

- Fully funded Higher Education Commission (HEC) Pakistan Faculty Development Scholarship for MS Leading to Ph.D. Program — Sep 2015 – Aug 2020
  For attaining a meritorious academic and Graduate Assessment Test (GAT) performance.
- Fully funded ICT (Information and Communication Technology) Undergraduate Scholarship, — Sep 2009– Jun 2013
  For attaining a meritorious academic and special selection test performance
- Among Top10 in undergraduate class of Electrical Computer Engineering Department, COMSATS Institute of Information Technology, Abbottabad — Jun 2013
- Received a cash prize from the then Governor Khyber Pakhtunkhwa (KPK), — Jul 2007
  By getting top position in Frontier Region (FR) Peshawar, in higher secondary school (F.Sc)
  Position holders Award ceremony at Governor House Khyber Pakhtunkhwa (KPK) for high and higher secondary school students of FATA.

CAMPUS ACTIVITIES

Energy harvesting communication Research Center (ERC),

- Weekly seminar — Feb 2017 – Aug 2020
  - Arranging and managing weekly seminar

- Regular presentations of new research trends in wireless energy harvesting communication

Young Researchers Society (YouRs),

- Biannual Research oriented Workshop
- Active members of the society helping young researchers to know new areas Feb 2017 – Aug 2020
  - Arranging and managing biannual seminar

COURSE WORK (UNDERGRADE)

- **Major Courses Category: Signal Processing, Wireless Communication and networks**

(i) Wireless Communication, (ii) Discrete Time Signal Processing, (iii) Signal & system, (iv) Data Communication and Networking, (v) Principle of Communication.

- **Major Courses Category: Programming Languages and Calculus**

(i) Programming in C, (ii) Data Structure and Algorithms, (iii) C/C++ and Object Oriented Programming in C++, (iv) Network Programming (iv), Calculus (I, II, II).

- **Major Courses Category: Digital Systems, Design and Computer Architecture**

(i) Digital Logic Design, (ii) Micro Processor and Micro Controller, (iii) Operating System Concept, (iv)Digital System Design and FPGA, (v) Computer Organization and Architecture.

- **Major Courses Category: Electronics, Power Distribution and Control Systems**

(i) Electronics (I,II), (ii) Circuit Analysis (I,II), (iii) Power Distribution and Utilization, (iv) Control System Engineering.

UNDERGRADUATE (BS) FINAL YEAR PROJECT

"Smart Vehicular Security System based on GSM Modem", Jun 2012 – Jun 2013

- Main Purpose: Design a smart vehicular security system.
- Work Principles: If an intruder tries to enter the vehicle, the system will automatically call at the owner's contact number.
- System Model: The owner can control various features remotely.
  - For example, Air-condition, windows, doors, car starter and many more features remotely through a mobile phone.
- Advanced features: The owner can captures a picture remotely of the intruder inside a car through installed digital camera in the system.
  - To check the inside status of the vehicle any time.

SEMESTER COURSE PROJECTES (UNDERGRADE)

Projects Experienced in Various Subjects (Undergrad),

- Chat Programming and File Sharing (Audio, Video, Text) using Socket Programming.
- Hospital Management in C++ (Console level).
- Analyzing Campus Network and Prepared a report.
- Arithmetic Logic Unit (ALU) hardware Implementation (Logic gates Level).
- FM Transmitter-Receiver, Walkie-Talkie.
- A variable DC Power-Supply from hot-salt water.

UNDERGRADUATE ACTIVITIES

COMSATS University Abbottabad Activities,

- A class representative in BS Aug 2009 – Jun 2011
  - Teacher to students communication responsibility
  - Arranging classes and managing students curricular and extra curricular activities
- Member of HERTZ Engineering society Aug 2009 – Jun 2013
  - In-campus engineering society
- Social worker and volunteer Aug 2009 – Jun 2013
  - Active member of Blood donors society

TECHNICAL SKILLS

Programming Languages experienced: MATLAB, C/C++, Python, LaTeX,
Raspberry Pi programming
Eclipse (Android Apps. development basic level) environment,
Simulation Softwares; Multisim, Protius etc. (undergraduate practice.),
FPGA Verilog/VHDL programming (undergraduate practice.)
Microsoft office (Word, Power point, Excel, Visio etc.),
Operating systems; Windows and Linux (Ubuntu)
Virtual machine (Virtual Box, etc.)

PERSONAL INFORMATION

- Religion: Islam
- Date of Birth: Feb. 26, 1989.

- Father Name: Mir Abbas Khan
- Marital Status: Married.
- Nationality: Pakistani.
- CNIC No: 22501-38xxxxx-1
- Domicile: Peshawar Subdivision Hassan-Khel.

LANGUAGES

- English: Fluent (speaking, reading, writing).
- Urdu: Fluent (speaking, reading, writing).
- Pashto: Native language.
- Korean: Very basic.

INTERESTS

Learning new Technologies (Softwares, Computer Languages etc.),
Reading Newspaper, Books,
Internet surfing (Researching),
Exploring new Places (Traveling).

OVERSEAS TRAVELING

- South Korea: Studies, Sep 2015 – Jul 2020
- Japan: Conference, Jan 2017
- Singapore: Conference, Dec 2017
- Taiwan: Conference, Jan 2020

REFERENCES

- **Professor Tae-Jin Lee**
  Professor in College of Information and Communication Engineering (CICE)
  Sungkyunkwan University
  Suwon, Korea
  tjlee@skku.edu