

# Zulfiqar Ahamd Khan

CURRICULUM VITAE

**Overview:** I am a research assistant and lab coordinator with experience in power generation and consumption forecasting for smart grid management, time-series data analysis, multimedia understanding for image processing, classification, and object detection, video surveillance data analysis for scene understanding, the IoT, and resource-constrained programming. I serve as the **Coordinator** of the Intelligent Media Laboratory (*IMLab*), where I lead a dynamic research group of 8 members and supervise laboratory projects. My technical skills include time-series data refinement and modelling for power generation and consumption forecasting, utilizing statistical, machine learning, and deep learning-based hybrid models, including CNN and RNN variants. I specialize in multimedia data analysis, applying advanced deep learning techniques such as object detection (YOLO, Faster R-CNN), anomaly recognition (FlowNet, I3D, 3D CNNs), and scene understanding. Additionally, I implement active and incremental learning techniques, enabling models to adapt to evolving data environments, and employ Explainable AI (XAI) methods for enhanced model interpretability and transparency in decision-making. My expertise extends to utilizing attention mechanisms, transformers, and ensemble learning techniques to enhance both prediction accuracy in time-series forecasting and model performance in computer vision tasks, ensuring robustness and improved accuracy in complex scenarios.

## Personal

Father Name:	Muhammad Yar Khan
Date of Birth:	15 July 1995
Material Status:	Single
Languages:	English, Pashto, Urdu
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Phone:	(+82) 10 4833 2613 (WhatsApp)

## Summary

Local Patents:	06
Total Journal Publication	26
First Author Publication:	10
Co-Author Publication:	16
Q1 Publications	21
Q2 Publications	5
Total Citation	1600+
h-index	18
i10-index	23
Google scholar	<a href="https://scholar.google.com/citations?user=TmDD6z8AAAAJ&amp;hl=en">https://scholar.google.com/citations?user=TmDD6z8AAAAJ&amp;hl=en</a>

SEP 2019-  
present

### Joint Master's and Ph.D.

Sejong University, Seoul, South Korea  
Department of Software

Thesis: A Study of Spatiotemporal Feature Analysis using Deep Hybrid Models for Power Forecasting

CGPA: 4.41/4.5

AUG 2016 -  
AUG 2018

### M.Sc. Computer Science

Islamia College Peshawar, Peshawar, Pakistan  
Department of Computer Science

Thesis: Towards smart home automation using IoT-enabled edge-computing paradigm ([DIPLab prototype](#))

CGPA: 3.61/4

## Research Experience

July 2024 -  
PRESENT

### IMLab Coordinator

Intelligent Media Laboratory, Sejong University, Seoul, South Korea

- Leading and directing a dynamic research group of 8 members specializing in cutting-edge fields such as Energy Informatics, Computer Vision, and Signal Processing.

- Providing partial supervision to Master and Ph.D. candidates, including managing Professor projects and ensuring compliance with project requirements.
- Actively engaging with students, offering guidance and support in generating ideas, implementing projects, and processing research articles.
- Demonstrating leadership in composing and crafting multi-year project proposals submitted to the National Research Foundation of Korea (NRF).
- Facilitating collaboration and knowledge exchange within the research group to foster a creative and innovative environment.
- Contributing to the advancement of the laboratory research agenda through strategic planning and effective project management.

Sep 2019 -  
PRESENT

### Partially supervising BS/MS students

Digital Image Processing Laboratory, Islamia College Peshawar, Peshawar, Pakistan

- Guiding implementation of image/video analyses and research articles.
- Providing technical support for advanced algorithm implementation in multiple projects.
- Conducting regular progress reviews and offering constructive feedback to enhance research quality.
- Facilitating workshops to improve students' skills in digital image processing techniques.

Sep 2019 –  
June 2024

### Research Assistant

Intelligent Media Laboratory, Sejong University, Seoul, South Korea

- Research and development for multiple projects, fostering innovation and knowledge growth in the laboratory.
- Collaborating with senior Lab members to ensure smooth execution of project implementations and handling complex tasks.
- Actively participating in the hands-on project implementation, translating research concepts into practical outcomes.

Mar 2017–  
Aug 2019

### Research Assistant

Digital Image Processing Laboratory, Islamia College Peshawar

- Overseeing research projects for Bachelor students, focusing on Energy Informatics, Smart Home Solutions, Resource-Constrained Programming, and IoT.
- Crafting project proposals to secure funding and resources for the laboratory ongoing initiatives.
- Actively participating in events and workshops to enhance knowledge exchange and stay updated on the latest advancements in the field.

Sep 2019–  
Present

### Research Collaborations

- Actively collaborating with research teams from diverse countries, including Saudi Arabia, Portugal, UK, Spain, Brazil, and Pakistan, fostering international partnerships.
- Participating in collaborative publications and joint presentations at international Journals.
- Expanding the network of research collaborations by establishing connections with institutions and researchers worldwide.

## Participated Projects

Since September 2019, I have been actively involved in several key research projects funded by the National Research Foundation of Korea (NRF), where my contributions have covered a variety of critical tasks. These include projects management, implementation of advanced algorithms and methodologies, drafting and publishing research articles, and developing patents based on innovative findings. Additionally, I have been responsible for preparing comprehensive yearly reports, ensuring that project progress is accurately documented and communicated to stakeholders.

Oct 2019– Feb 2021	Software central university support project (1711073386) National Research Foundation of Korea (NRF)
Oct 2019– Dec 2023	Development of ensemble methods-based XAI energy platform for effective energy consumption pattern and factor analysis (2019M3F2A10731792320682075910203) National Research Foundation of Korea (NRF)
Oct 2019– Feb 2022	Multi-view video data analysis technology for smart city based intelligent surveillance system (2019R1A2B5B010700671320682075910103) National Research Foundation of Korea (NRF)
Mar 2023– Feb 2025	Anomaly behaviour recognition for accident prevention in the connected vision environment (2023R1A2C10057881220682075910102) National Research Foundation of Korea (NRF)
Jan 2024– April 2024	Battery health prediction (2020R1A6A1A03038540) National Research Foundation of Korea (NRF)
April 2024– Dec 2024	Development and demonstration of AI policy simulation platform technology to solve social problems in depopulated areas (RS-2024-0033958320682075910001) Institute of Information & communications Technology Planning (IITP)
Sep 2024– Feb 2025	Data hub for solid electrolyte materials based on syncrolab data cloud (RS-2024-00446825) National Research Foundation of Korea (NRF)

## Awards & Honors

Aug 2024	Recognized among the top 2% of scientists globally, as per the "Updated Science-Wide Author Databases of Standardized Citation Indicators" ( <a href="#">2024</a> ).
Sep 2023	Best Paper Award Next Generation Computing Conference, Best Western Premier Hotel, Jeju, South Korea
Sep 2019	100% Study Scholarship Sejong University, Seoul, South Korea, for Joint Master's and Ph.D. Degree
Aug 2019	Winner of Business Plan Competition Office of Research, Innovation and Commercialization (ORIC), Islamia College Peshawar, Peshawar, KPK, Pakistan
Dec 2019	100% Study Scholarship Islamia College Peshawar, Pakistan for M.Sc. Degree

## Journal Publications

### 2024

1. **Zulfiqar Ahmad Khan**, Shabbir Ahmad Khan, Tanveer Hussain, Sung Wook Baik, "DSPM: Dual sequence prediction model for efficient energy management in micro-grid," *Applied Energy*, vol. 356, p. 122339, 2024. IF: 11.2, Q1, Top: 6%
2. Hikmat Yar, **Zulfiqar Ahmad Khan**, Tanveer Hussain, Sung Wook Baik, "A modified vision transformer architecture with scratch learning capabilities for effective fire detection", *Expert Systems with Applications*, vol. 252, p. 123935, 2024. IF: 8.5, Q1, Top: 7%
3. Adnan Hussain, Waseem Ullah, Noman Khan, **Zulfiqar Ahmad Khan**, Min Je Kim, Sung Wook Baik, "TDS-Net: Transformer enhanced dual-stream network for video Anomaly Detection", *Expert Systems with Applications*, vol. 256, p. 124846, 2024. IF: 8.5, Q1, Top: 7%

4. Hikmat Yar, **Zulfiqar Ahmad Khan**, Imad Rida, Waseem Ullah, Min Je Kim, Sung Wook Baik, "An efficient deep learning architecture for effective fire detection in smart surveillance", *Image and Vision Computing*, vol. 145, p. 104989, 2024. IF: 4.7, Q1, Top: 18%
5. Habib Khan, Tanveer Hussain, Samee Ullah Khan, **Zulfiqar Ahmad Khan**, Sung Wook Baik, "Deep multi-scale pyramidal features network for supervised video summarization," *Expert Systems with Applications*, vol. 237, p. 121288, 2024. IF: 8.5, Q1, Top: 7%

## 2023

6. **Zulfiqar Ahmad Khan**, Tanveer Hussain, Waseem Ullah, Sung Wook Baik, " A Trapezoid Attention Mechanism for Power Generation and Consumption Forecasting ", *IEEE Transactions on Industrial Informatics*. [Early access] IF: 12.3, Q1, Top: 1
7. **Zulfiqar Ahmad Khan**, Tanveer Hussain, Sung Wook Baik, "Dual stream network with attention mechanism for photovoltaic power forecasting," *Applied Energy*, vol. 338, p. 120916, 2023. IF: 11.4, Q1, Top: 5%
8. **Zulfiqar Ahmad Khan**, Tanveer Hussain, Amin Ullah, Waseem Ullah, Javier Del Ser, Khan Muhammad, Muhammad Sajjad, Sung Wook Baik, "Modelling Electricity Consumption During the COVID19 Pandemic: Datasets, Models, Results and a Research Agenda," *Energy and Buildings*, p. 113204, 2023. IF: 7.20, Q1, Top: 5%
9. Taimoor Khan, **Zulfiqar Ahmad Khan**, Chang Choi, "Enhancing real-time fire detection: an effective multi-attention network and a fire benchmark," *Neural Computing and Applications*, pp. 1-15, 2023. IF: 6.0, Q2, Top: 28%
10. Hikmat Yar, Waseem Ullah, **Zulfiqar Ahmad Khan**, Sung Wook Baik, "An Effective Attention-based CNN Model for Fire Detection in Adverse Weather Conditions," *ISPRS Journal of Photogrammetry and Remote Sensing*, vol. 206, pp. 335-346, 2023. IF: 12.7, Q1, Top: 1%
11. Hikmat Yar, **Zulfiqar Ahmad Khan**, Fath U Min Ullah, Waseem Ullah, Sung Wook Baik, "A modified YOLOv5 architecture for efficient fire detection in smart cities," *Expert Systems with Applications*, vol. 231, p. 120465, 2023. IF: 8.5, Q1, Top: 7%
12. Waseem Ullah, Fath U Min Ullah, **Zulfiqar Ahmad Khan**, Sung Wook Baik, "Sequential Attention Mechanism for Weakly Supervised Video Anomaly Detection," *Expert Systems with Applications*, p. 120599, 2023. IF: 8.5, Q1, Top: 7%

## 2022

13. **Zulfiqar Ahmad Khan**, Tanveer Hussain, Fath U Min Ullah, Suneet Kumar Gupta, Mi Young Lee, Sung Wook Baik, "Randomly initialized CNN with densely connected stacked autoencoder for efficient fire detection," *Engineering Applications of Artificial Intelligence*, vol. 116, p. 105403, 2022. IF: 7.80, Q1, Top: 5%
14. **Zulfiqar Ahmad Khan**, Tanveer Hussain, Ijaz Ul Haq, Fath U Min Ullah, Sung Wook Baik, "Towards efficient and effective renewable energy prediction via deep learning," *Energy Reports*, vol. 8, pp. 10230-10243, 2022. IF: 4.97, Q2, Top: 47%
15. **Zulfiqar Ahmad Khan**, Amin Ullah, Ijaz Ul Haq, Mohamed Hamdy, Gerardo Maria Mauro, Khan Muhammad, Mohammad Hijji, Sung Wook Baik, "Efficient short-term electricity load forecasting for effective energy management," *Sustainable Energy Technologies and Assessments*, vol. 53, p. 102337, 2022. IF: 7.63, Q2, Top: 27%
16. **Zulfiqar Ahmad Khan**, Tanveer Hussain, Sung Wook Baik, "Boosting energy harvesting via deep learning-based renewable power generation prediction," *Journal of King Saud University-Science*, vol. 34, no. 3, p. 101815, 2022. IF: 4.01, Q1, Top: 17%
17. Waseem Ullah, Tanveer Hussain, **Zulfiqar Ahmad Khan**, Umair Haroon, Sung Wook Baik, "Intelligent dual stream CNN and echo state network for anomaly detection," *Knowledge-Based Systems*, vol. 253, p. 109456, 2022. IF: 8.14, Q1, Top: 13%
18. Altaf Hussain, **Zulfiqar Ahmad Khan**, Tanveer Hussain, Fath U Min Ullah, Seungmin Rho, Sung Wook Baik, "A hybrid deep learning-based network for photovoltaic power forecasting," *Complexity*, vol. 2022, 2022. IF: 2.12, Q2, Top: 26%
19. Hikmat Yar, Tanveer Hussain, Mohit Agarwal, **Zulfiqar Ahmad Khan**, Suneet Kumar Gupta, Sung Wook Baik, "Optimized dual fire attention network and medium-scale fire classification benchmark," *IEEE Transactions on Image Processing*, vol. 31, pp. 6331-6343, 2022. IF: 11.04, Q1, Top: 4%
20. Khan Muhammad, Hayat Ullah, **Zulfiqar Ahmad Khan**, Abdul Khader Jilani Saudagar, Abdullah AlTameem, Mohammed AlKhathami, Muhammad Badruddin Khan, Mozaherul Hoque Abul Hasanat, Khalid Mahmood Malik, Mohammad Hijji, Muhammad Sajjad, "WEENet: an intelligent system for diagnosing COVID-19 and lung cancer in IoMT environments," *Frontiers in oncology*, vol. 11, p. 811355, 2022. IF: 5.7, Q1, Top: 32%

## 2021

21. Samee Ullah Khan, Ijaz Ul Haq, **Zulfiqar Ahmad Khan**, Noman Khan, Mi Young Lee, Sung Wook Baik, "Atrous convolutions and residual GRU based architecture for matching power demand with supply," *Sensors*, vol. 21, no. 21, p. 7191, 2021. IF: 3.57, Q1, Top: 21%

22. Hikmat Yar, Ali Shariq Imran, **Zulfiqar Ahmad Khan**, Muhammad Sajjad, Zenun Kastrati, "Towards smart home automation using IoT-enabled edge-computing paradigm," *Sensors*, vol. 21, no. 14, p. 4932, 2021. IF: 3.27 Q1, Top: 23%
23. Waseem Ullah, Amin Ullah, Tanveer Hussain, **Zulfiqar Ahmad Khan**, Sung Wook Baik, "An efficient anomaly recognition framework using an attention residual LSTM in surveillance videos," *Sensors*, vol. 21, no. 8, p. 2811, 2021. IF: 3.27 Q1, Top: 23%.

## 2020

24. **Zulfiqar Ahmad Khan**, Amin Ullah, Waseem Ullah, Seungmin Rho, Miyoung Lee, Sung Wook Baik, "Electrical energy prediction in residential buildings for short-term horizons using hybrid deep learning strategy," *Applied Sciences*, vol. 10, no. 23, p. 8634, 2020. IF: 11.4, Q1, Top: 35%
25. **Zulfiqar Ahmad Khan**, Tanveer Hussain, Amin Ullah, Seungmin Rho, Miyoung Lee, Sung Wook Baik, "Towards efficient electricity forecasting in residential and commercial buildings: A novel hybrid CNN with a LSTM-AE based framework," *Sensors*, vol. 20, no. 5, p. 1399, 2020. IF: 3.74, Q1, Top: 17%
26. Muhammad Sajjad, **Zulfiqar Ahmad Khan**, Amin Ullah, Tanveer Hussain, Waseem Ullah, Mi Young Lee, Sung Wook Baik, "A novel CNN-GRU-based hybrid approach for short-term residential load forecasting," *IEEE Access*, vol. 8, pp. 143759-143768, 2020. IF: 2.47 Q2, Top: 34%

## Peer Review Journal Articles

1. **Zulfiqar Ahmad Khan**, Fath U Min Ullah, Hikmat Yar, Waseem Ullah, Sung Wook Baik "Optimized Cross Module Attention Network and Database for Fire Detection" (Minor Revision submitted, Pattern Recognition Journal)
2. **Zulfiqar Ahmad Khan** and Sung Wook Baik "Incremental Learning Enhanced Dual-Stream Deep Attention Network for Power Forecasting" (Major Revision Submitted, Journal of Building Engineering)
3. Hikmat Yar, Fath U Min Ullah, **Zulfiqar Ahmad Khan**, Min Je Kim, Sung Wook Baik "EFNet-CSM: EfficientNet with a Modified Attention Mechanism for Effective Fire Detection" (Major Revision, Knowledge based systems Journal)
4. Hikmat Yar, **Zulfiqar Ahmad Khan**, Waseem Ullah, Samee Ullah Khan, Habib Khan, Min Je Kim, Sung Wook Baik "AVRNet: A Unified Deep Supervised Network for Effective Animal Voice Recognition" (Submitted to Information Processing and Management)
5. Hikmat Yar, **Zulfiqar Ahmad Khan**, Waseem Ullah, Min Je Kim, Sung Wook Baik "Attention Enhanced YOLOV8 Architecture and a Benchmark for Fire Detection in Smart Surveillance and Remote Sensing" (Submitted to Remote Sensing of Environment)
6. Waseem Ullah, Fath U Min Ullah, **Zulfiqar Ahmad Khan**, and Sung Wook Baik, Min Je Kim, Sung Wook Baik "Ensemble Feature learning with Spatiotemporal Share Attention Memory for Anomaly Detection". (Submitted to IEEE Transactions on Cybernetics)
7. Waseem Ullah, **Zulfiqar Ahmad Khan**, Hikmat Yar and Sung Wook Baik "A Dual Stream Attention Network for real world Anomalies Recognition " (Submitted to IEEE Transactions on Circuits and Systems for Video Technology)
8. Waseem Ullah, **Zulfiqar Ahmad Khan**, Hikmat Yar and Sung Wook Baik "Anomaly Recognition and Localization in Surveillance System " (Submitted to Engineering Applications of Artificial Intelligence)
9. Hikmat Yar, **Zulfiqar Ahmad Khan**, Waseem Ullah, Min Je Kim, Sung Wook Baik, "Deep Learning-Enhanced Driver Behavior Assessment with Spatial Awareness for Safe Transportation" (Submitted to Advanced Engineering Informatics)
10. Hikmat Yar, Adnan Hussain, **Zulfiqar Ahmad Khan**, Min Je Kim, and Sung Wook Baik, "Hybrid Network with Additive Attention and Explainable AI for Accurate Population Forecasting"
11. Altaf Hussain, Muhammad Munsif, **Zulfiqar Ahmad Khan**, Min je Kim, and Sung Wook Baik "A Structure-Agnostic Transformer Framework for Enhanced Materials Discovery in Engineering Informatics" (Submitted to Journal of Materials Science & Technology)
12. Muhammad Munsif, Altaf Hussain, **Zulfiqar Ahmad Khan**, Min je Kim, and Sung Wook Baik, "Hierarchical Attention-Based Framework for Enhanced Prediction and Optimization of Inorganic Material Synthesis" (Submitted to Chemical Engineering Journal)
13. Adnan Hussain, Waseem Ullah, Noman Khan, **Zulfiqar Ahmad Khan**, Hikmat Yar, Min Je Kim, Sung Wook Baik, "Class Incremental Learning Network for Real-Time Anomaly Recognition in Surveillance Environments" (Major Revision, IEEE Transactions on Multimedia)

14. Adnan Hussain, Noman Khan, **Zulfiqar Ahmad Khan**, Hikmat Yar, Min Je Kim, Sung Wook Baik, “IoT Enable Instant Anomaly Detection and Detailed Anomaly Recognition in Smarts Surveillance Environment” (Submitted to Knowledge-Based Systems)

## Conferences

1. Fath U Min Ullah, **Zulfiqar Ahmad Khan**, Sung Wook Baik, Estefania Talavera, Saeed Anwar, Khan Muhammad, “Dual Deep Learning Network for Abnormal Action Detection” 2024 IEEE International Conference on Advanced Video and Signal Based Surveillance (AVSS).
2. **Zulfiqar Ahmad Khan**, Waseem Ullah, Hikmat Yar, Noman Khan, Min Je Kim and Sung Wook Baik “Dataset Standardization for Effective Solar Power Forecasting: A Comprehensive Analysis” The 9th International Conference on Next Generation Computing (ICNGC 2023) Danang, Vietnam.
3. Noman Khan, Waseem Ullah, **Zulfiqar Ahmad Khan**, Adnan Hussain, Min Je Kim, Sang Il Yoon and Sung Wook Baik, “Comparative Analysis of Solar Power Generation Forecasting Models for Identical Latitude Countries Data”. The 9th International Conference on Next Generation Computing (ICNGC 2023) Danang, Vietnam.
4. **Zulfiqar Ahmad Khan**, Noman Khan, Su Min Lee, Sang Il Yoon, Mi Young Lee and Sung Wook Baik, “Solar Power Prediction using Dual Stream CNN-LSTM Architecture” Korea Next Generation Computing Society Spring Conference 2022.
5. Habib Khan, **Zulfiqar Ahmad Khan**, Waseem Ullah, Min Jee Kim, Mi Young Lee, Sung Wook Baik, “Efficient vehicle detection in aerial scenes” Korea Next Generation Computing Society Spring Conference 2022.
6. Muhammad Munsif, Habib Khan, **Zulfiqar Ahmad Khan**, Altaf Hussain, Fath U Min Ullah, Mi Young Lee and Sung Wook Baik, “PV-ANet: Attention-Based Network for Short-term Photovoltaic Power Forecasting” The 8th International Conference on Next Generation Computing 2022.
7. Su Min Lee, Min Je Kim, Samee Ullah Khan, Zulfiqar Ahmad Khan, Noman Khan, Mi Young Lee and Sung Wook Baik, “Deep Learning framework for intelligent surveillance video analytics” The 7th International Conference on Next Generation Computing 2021.
8. **Zulfiqar Ahmad Khan**, Waseem Ullah, Amin Ullah, Seungmin Rho, Mi Young Lee, Sung Wook Baik, “An Adaptive Filtering Technique for Segmentation of Tuberculosis in Microscopic Images” NLPiR 2020: 2020 4th International Conference on Natural Language Processing and Information Retrieval.

## Patents

1. Sung-Wook Baik, RHO, Seung-Min, LEE, Mi-Young, **Zulfiqar Ahmad Khan**, Tanveer Hussain, and Amin Ullah, “Power consumption prediction system of residential and commercial building using hybrid convolution neural network and method thereof” **Registration No:** 1025005480000 (Korean Patent)
2. Sung-Wook Baik, LEE, Mi-Young, Waseem Ullah, Tanveer Hussain, and **Zulfiqar Ahmad Khan**, “Anomaly recognition method and system based on LSTM” **Registration No:** 1026012330000
3. Sung-Wook Baik, LEE, Mi-Young, **Zulfiqar Ahmad Khan**, Tanveer Hussain, Kim Minje, “Method for predicting renewable energy consumption and production based on deep learning and apparatus thereof” **Application No:** 1020220061428 (Submitted)
4. Sung-Wook Baik, LEE, Mi-Young, Altaf Hussain, **Zulfiqar Ahmad Khan**, Fath U Min Ullah, Kim Minje, and Lee Sumin “Method for predicting renewable energy consumption and production based on deep learning and apparatus thereof” **Registration No:** 1025335080000
5. Sung-Wook Baik, LEE, Mi-Young, **Zulfiqar Ahmad Khan**, Kim Minje, Yoon Sangil, and Lee Sumin “Method for predicting energy production and consumption data using double sequence deep learning model, and apparatus thereof” **Registration No:** 1025218070000
6. Sung-Wook Baik, LEE, Mi-Young, **Zulfiqar Ahmad Khan**, Fath U Min Ullah, Kim Minje, Yoon Sangil, and Lee Sumin “method for predicting energy consumption and production based on using hybrid convolutional neural network and regression neural network and apparatus thereof” **Registration No:** 1025218080000

## Technical Skills

- Programming Languages: Python, C++, PhP, etc.
- Deep Learning Frameworks: TensorFlow, Keras, PyTorch, etc.
- Computer Vision Tools: OpenCV, Scikit-image, Pillow, etc.

- Data Analysis & Visualization: Pandas, NumPy, Matplotlib, Seaborn, etc.
- Database Management: XAMP, MySQL, SQLite
- IoT Technologies: MQTT, Raspberry Pi, Arduino
- Version Control: Git, GitHub
- Development Environments: Spyder, Geany, Jupiter Notebook, etc.
- Machine Learning Algorithms: Supervised and unsupervised learning, active learning, incremental learning, etc.
- Statistical Analysis: Time series data analysis, regression models, data refinement methods, etc.
- Simulation Software: MATLAB Simulink
- Document Processing: LaTeX, Microsoft Office

## **Member of Reviewer Board in Multiple Publisher (60+ reviews)**

- IEEE Transactions on Cybernetics
- IEEE Transactions on Industrial Informatics
- Journal of King Saud University - Computer and Information Sciences
- Engineering Application of Artificial Intelligence
- Knowledge Based System.
- Information Processing and Management
- Artificial Intelligence Review
- Cluster Computing
- Energy Efficiency
- Stochastic Environmental Research and Risk Assessment
- Scientific Report
- IET Generation, Transmission & Distribution
- IET Renewable Energy
- etc. detailed review list ([ORCID](#))

## **References**

### **Prof. Sung Wook Baik** - Ph.D. Supervisor

- Full Professor and Director of Intelligent Media Laboratory (IMLab)
- Department of Software, Sejong University, Seoul, South Korea
- Email: [sbaik@sejong.ac.kr](mailto:sbaik@sejong.ac.kr)

### **Dr. Tanveer Hussain**

- Lecturer
- Department of Computer Science, Edge Hill University, UK
- Email: [hussaint@edgehill.ac.uk](mailto:hussaint@edgehill.ac.uk)

### **Dr. Waseem Ullah**

- Postdoc Researcher
- Mohamed bin Zayed University of Artificial Intelligence, Abu Dhabi, United Arab Emirates
- Email: [waseem.ullah@mbzuai.ac.ae](mailto:waseem.ullah@mbzuai.ac.ae), [waseemullah@ieee.org](mailto:waseemullah@ieee.org)