

# MUHAMMAD MUNSIF

Lead Researcher, Intelligent Media Laboratory, Daeyang AI Center, Sejong University, Seoul, South Korea

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## RESEARCH INTERESTS

Deep Learning, Multimodal Action Recognition, Multi-view Action Recognition, Computer Vision, Deep Reinforcement Learning, Virtual and Augmented Reality, Materials and Energy Informatics.

## RESEARCH PROFILE OVERVIEW

### Key Research Metrics and Academic Achievements

Publication Output	Research Impact	Innovation & Recognition
Total Publications: <b>40</b>	Total Citations: <b>600+</b>	Patents: <b>4</b>
SCI/SCIE/Scopus Journals: 14	h-index: 11	Research Projects: 8
First Author SCI/SCIE: 10	i10-index: 14	Awards: 4
Under Review: 11	Average IF (Q1): 8.2	IEEE Member: Active
Conference Papers: 11	Top Journals: <i>IEEE TII, TIP</i>	Research Experience: 5+ years
Book Chapters: 1	Highest IF: 9.9	Certifications: 5
Preprints (arXiv): 3	Q1 Papers: 11	International Co-authors: 30+
Domestic Conferences: 4	Peer Reviews: 100+	Teaching: 4 Courses

## EDUCATION

**Joint Master's and Ph.D. in Software** Sep 2021 – Feb 2026 (Expected)

Sejong University, Seoul, South Korea

**Thesis:** A Study of Multi-view and Multimodal Deep Learning Techniques for Action Recognition in Dark and Low-Light Surveillance Systems

**Bachelor of Science in Computer Science** 2016 – 2020

Islamia College, Peshawar, Pakistan

**Thesis:** Deep Reinforcement Learning Assisted Navigation Framework for Autonomous Car in A Virtual City

## ACADEMIC & RESEARCH EXPERIENCE

**Lead Researcher & Lab Coordinator** (Lab Management, Students Co-supervision ) Apr 2023 – Feb 2026  
Intelligent Media Lab, Daeyang AI Center, Sejong University, Seoul, South Korea

**Teacher Assistant** (Graduate Computer Vision & Intelligent Drone Courses) Mar 2023 – Aug 2024  
Department of Software, Sejong University, Seoul, South Korea

**Research Assistant** (NRF Projects) Sep 2021 – Mar 2023  
Intelligent Media Lab, Daeyang AI Center, Sejong University, Seoul, South Korea

**Teacher Assistant** (Undergraduate Digital Image Processing and ANN Courses) Sep 2020 – Aug 2021  
Dept of Computer Science, Islamia College Peshawar, Pakistan

**Lab Coordinator & Research Assistant** ( Lab Management, DL & VR Projects) Sep 2017 – Aug 2021  
Digital Image Processing Lab, Islamia College Peshawar, Peshawar, Pakistan

## PARTICIPATED PROJECTS

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- Anomaly Behavior Recognition for Accident Prevention in the Connected Vision Environment** Jan 2023 – Feb 2026  
**Role:** Researcher | Funded by NRF of Korea (PID: RS-2023-NR076686)
- Brain Korea 21 (BK21 FOUR) Education Research Group for Intelligent Drones** Mar 2022 – Feb 2026  
**Role:** BK21 Scholar | Funded by the National Research Foundation of Korea.
- Data HUB for Solid Electrolyte Materials Based on SyncroLab Data Cloud** Jul 2024 – Dec 2025  
**Role:** Researcher | Funded by NRF of Korea (PID: RS-2024-00446825)
- Development of a Recycling Technology for Lithium Iron Phosphate Batteries that Maximizes Carbon Dioxide Utilization** Sep 2023 – Apr 2024  
**Role:** Researcher | Funded by Ministry of Education, Korea (PID: 2020-R1-A6A1A03038540)
- DL-based Anomaly Detection and Predictive Maintenance Management System for Industrial Machinery** Jan 2023 – Jun 2023  
**Role:** Researcher | Funded by the Seoul R&D Program (PID: 2023R1A2C1005788)
- Open Platform Technology for Autonomous Participation of Energy Network Components** Sep 2021 – Dec 2023  
**Role:** Research Assistant | Funded by NRF of Korea (PID: 2019M3F2A1073179)
- Bridging the Early Diagnosis and Treatment Gap of Brain Diseases** Sep 2020 – Aug 2021  
**Role:** Research Assistant | Funded by the EU Horizon 2020 Research Innovation Program.
- Virtual Reality-based Learning and Training Strategy for Children** Jan 2018 – Aug 2020  
**Role:** Research Assistant | Funded by the HCR Endowment Fund(PMUI-22/VOL-IV/3410)

## PUBLICATIONS

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### Peer-Reviewed Journal Publications (SCI/SCIE/Scopus Indexed)

1. **Muhammad Munsif**, Samee Ullah Khan, Noman Khan, Altaf Hussain, Min Je Kim, Sung Wook Baik, [Action understanding in low-light and pitch-dark conditions: A comprehensive survey](#), 2025  
 Engineering Applications of Artificial Intelligence, IF: 8.0, Rank: Q1, Top 2.76
2. **Muhammad Munsif**, Altaf Hussain, Zulfiqar Ahmad Khan, Min Je Kim, Sung Wook Baik, [Hierarchical attention-based framework for enhanced prediction and optimization of organic and inorganic material synthesis](#), 2025, Advanced Engineering Informatics, IF: 9.9, Rank: Q1, Top 2.2
3. Muhammad Hijji<sup>†</sup>, **Muhammad Munsif**<sup>†</sup>, Maram Alwakeel, Ali Alwakeel, Fatimah Aradah, Faouzi Alaya Cheikh, Muhammad Sajjad, Khan Muhammad, [Proximal policy optimization for collision avoidance and motion planning in autonomous vehicles: a mathematical modeling perspective](#), 2025, Fractals, IF: 2.9, Rank: Q1, Top 11.7
4. **Muhammad Munsif**, Noman Khan, Altaf Hussain, Min Je Kim, Sung Wook Baik, [Darkness-Adaptive Action Recognition: Leveraging Efficient Tubelet Slow-Fast Network for Industrial Applications](#). 2024, IEEE Transactions on Industrial Informatics, IF: 9.9, Rank: Q1, Top 2.2
5. **Muhammad Munsif**, Samee Ullah Khan, Noman Khan, Altaf Hussain, Min Je Kim, Sung Wook Baik. [Contextual visual and motion salient fusion framework for action recognition in dark environments.](#), 2024, Knowledge-Based Systems, IF: 7.6, Rank: Q1, Top 12.7
6. **Muhammad Munsif**, Samee Ullah Khan, Noman Khan, Sung Wook Baik. [Attention-Based Deep Learning Framework for Action Recognition in a Dark Environment](#), 2024, Human-centric Computing and Information Sciences, IF: 3.0, Rank: Q2, Top 39.5
7. **Muhammad Munsif**, Muhammad Sajjad, Mohib Ullah, Ashagre Negash Tarekegn, Faouzi Alaya Cheikh, Panagiotis Tsakanikas, Khan Muhammad. [Optimized efficient attention-based network for facial expressions analysis in neurological health care](#), 2024, Computers in Biology and Medicine, IF: 6.3, Rank: Q1, Top 5.9

8. Wasim Ullah, Samee Ullah Khan, Min Je Kim, Altaf Hussain, **Muhammad Munsif**, Mi Young Lee, Donghwan Seo, Sung Wook Baik. [Industrial defective chips detection using deep convolutional neural network with inverse feature matching mechanism](#), 2024, Journal of Computational Design and Engineering, IF: 6.1, Rank: Q1, Top 6.7
9. Waqas Ahmad, **Muhammad Munsif**, Habib Ullah, Mohib Ullah, Alhanouf Abdulrahman Alsuwailem, Abdul Khader Jilani Saudagar, Khan Muhammad, Muhammad Sajjad. [Optimized deep learning-based cricket activity focused network and medium scale benchmark](#), 2023, Alexandria Engineering Journal, IF: 6.8, Rank: Q1, Top 3.9
10. **Muhammad Munsif**, Fath U Min Ullah, Samee Ullah Khan, Noman Khan, Sung Wook Baik, [CT-NET: A Novel Convolutional Transformer-Based Network for Short-Term Solar Energy Forecasting Using Climatic Information](#), 2023, Computer Systems Science and Engineering.
11. Mohib Ullah, Sareer Ul Amin, **Muhammad Munsif**, Utkurbek Safaev, Habib Khan, Salman Khan, Habib Ullah. [Serious Games in Science Education. A Systematic Literature Review](#), 2022, Virtual Reality and Intelligent Hardware.
12. Habib Khan, Ijaz Ul Haq, **Muhammad Munsif**, Mustaqeem, Shafi Ullah Khan, Mi Young Lee. [Automated Wheat Diseases Classification Framework Using Advanced Machine Learning Technique.](#), 2022, Agriculture-Basel, IF: 3.6, Rank: Q1, Top 12.1
13. Muhammad Irfan, **Muhammad Munsif**. [Deepdive: A Learning-Based Approach for Virtual Camera in Immersive Contents](#), 2022, Virtual Reality and Intelligent Hardware.
14. Noman Khan, Khan Muhammad, Tanveer Hussain, Mansoor Nasir, **Muhammad Munsif**, Ali Shariq Imran, Muhammad Sajjad. [An adaptive game-based learning strategy for children road safety education and practice in virtual space](#), 2021, Sensors, IF: 3.5, Rank: Q2, Top 25.3

#### Ongoing Peer-Review Journal Publications (SCI/SCIE Indexed)

1. **Muhammad Munsif**, Altaf Hussain, Sung Wook Baik, View-invariant deep learning framework for action recognition in darkness, IEEE Transactions on Multimedia, IF: 9.7, Rank: Q1, Top 2.0, *Status: Major Revision Submitted*
2. **Muhammad Munsif**, Waqas Ahmad, Amjid Ali, Mohib Ullah, Adnan Hussain, and Sung Wook Baik, Multi-camera connected vision system with multi-view analytics: a comprehensive survey, IEEE Transactions on Big Data, IF: 5.7, Rank: Q1, Top 6.0, *Status: Under Review*
3. **Muhammad Munsif**, Noman Khan, Altaf Hussain, Min Je Kim, Sung Wook Baik, Enhancing 24/7 environmental monitoring: a multimodal and illumination-resilient framework for human action recognition, IEEE Transactions on Image Processing, IF: 13.7, Rank: Q1, Top 2.0, *Status: Under Review*
4. Fath U Min Ullah, **Muhammad Munsif**, Khan Muhammad, Jaime Lloret, Mohammad Hijji, Sung Wook Baik, Renewable energy generation: a comprehensive survey, current challenges, and future research endeavors, Engineering Applications of Artificial Intelligence, IF: 7.5, Rank: Q1, Top 2.76, *Status: Under Review*
5. Altaf Hussain, **Muhammad Munsif**, Zulfiqar Ahmad Khan, Kaleem Ullah, Kee-Sun Sohn, Sung Wook Baik, Multi-model structure-agnostic framework for enhanced materials discovery in engineering informatics, Advanced Engineering Informatics, IF: 9.9, Rank: Q1, Top 2.2, *Status: Major Revision Submitted*
6. Adnan Hussain, Kaleem Ullah, Muhammad Afaq, **Muhammad Munsif**, Altaf Hussain, Sung Wook Baik, Quality over quantity: a data-centric survey of annotation errors in object detection datasets, Artificial Intelligence Review, IF: 13.9, Rank: Q1, Top 3.0, *Status: Under Review*
7. Adnan Hussain, **Muhammad Munsif**, Sung Wook Baik, VMAE-Time: a temporal masked autoencoding framework for self-supervised video anomaly detection, IEEE Transactions on Multimedia, IF: 9.7, Rank: Q1, Top 2.0, *Status: Under Review*
8. Min Je Kim, **Muhammad Munsif**, Altaf Hussain, Sung Wook Baik, Density-aware region proposal framework for enhanced object detection, Information Sciences, IF: 6.5, Rank: Q1, Top 8.0, *Status: Under Review*
9. Min Je Kim, **Muhammad Munsif**, Altaf Hussain, Hikmat Yar, Sung Wook Baik, Pseudo-labeling driven refinement of benchmark object detection datasets via learning patterns analysis, Pattern Recognition, IF: 7.5, Rank: Q1, Top 5.0, *Status: Under Review*

10. Kaleem Ullah, Altaf Hussain, **Muhammad Munsif**, Kee-Sun Sohn, Sung Wook Baik, DATGNN: differential attention transformer-enhanced graph neural network for accurate material property prediction, Engineering Applications of Artificial Intelligence, IF: 8.0, Rank: Q1, Top 2.7, *Status: Under Review*
11. Kaleem Ullah, Altaf Hussain, **Muhammad Munsif**, Sung Wook Baik, DREAM: dual-path representation encoding and attention modeling for video retrieval, IEEE Transactions on Image Processing, IF: 13.7, Rank: Q1, Top 2.0, *Status: Under Review*

#### Publications/Presentations at Peer-Reviewed Conferences (CVPR, EUVIP, ICNGC, etc.)

1. Altaf Hussain, Noman Khan, **Muhammad Munsif**, Min Je Kim, Sung Wook Baik, [Medium Scale Benchmark for Cricket Excited Actions Understanding](#), IEEE Computer Society Conference on Computer Vision and Pattern Recognition Workshops(CVPRW), 2024.06
2. Altaf Hussain, **Muhammad Munsif**, Zulfiqar Ahmad Khan, Su Min Lee, Min Je Kim, Sung Wook Baik, [Machine Learning-Based Stability Prediction for Material Synthesis for Silicon Anodes in Multivalent Cation Batteries](#), International Conference on Next Generation Computing (ICNGC), 2024.11
3. Waseem Ullah, Altaf Hussain, **Muhammad Munsif**, Habib Khan, Min Je Kim, Su Min Lee, Myoung Ho Seong, Sung Wook Baik, [A Survey of AI-Empowered Methods for Detecting Electricity Theft in Smart Grids](#), International Conference on Next Generation Computing (ICNGC), 2023.12
4. Younghoon Kim, **Muhammad Munsif**, Altaf Hussain, [Immersive Learning: A Virtual Reality Approach to Combat Light Pollution](#), International Conference on Next Generation Computing (ICNGC), 2023.12
5. **Muhammad Munsif**, Habib Khan, Zulfiqar Ahmad Khan, Altaf Hussain, Fath U Min Ullah, Mi Young Lee, Sung Wook Baik, [Pv-anet: Attention-based network for short-term photovoltaic power forecasting](#), International Conference on Next Generation Computing (ICNGC), 2022.10
6. **Muhammad Munsif**, Hina Afridi, Mohib Ullah, Sultan Daud Khan, Faouzi Alaya Cheikh, Muhammad Sajjad, [A Lightweight Convolution Neural Network for Automatic Disasters Recognition](#), 2022, Proceedings - European Workshop on Visual Information Processing (EUVIP), 2022.09
7. **Muhammad Munsif**, Noman Khan, Tanveer Hussain, Muhammad Sajjad, Mi Young Lee, [Efficient Battery's State of Charge Estimation in Energy Storage Systems](#), International Conference on Next Generation Computing (ICNGC), 2021.11

#### Book Chapter Publications

1. **Muhammad Munsif**, Mohib Ullah, Bilal Ahmad, Muhammad Sajjad, Faouzi Alaya Cheikh. [Monitoring Neurological Disorder Patients via Deep Learning Based Facial Expressions Analysis](#), 2022, IFIP Advances in Information and Communication Technology

#### Presentations at Domestic Conferences

1. Muhammad Afaq, Adnan Hussain, Hikmat Yar, **Muhammad Munsif**, Min Je Kim, Sung Wook Baik, Analyzing City-Level Population Movement in China with Graph Neural Networks, KINGPC, 2025.05
2. Altaf Hussain, Noman Khan, **Muhammad Munsif**, Adnan Hussain, Min Je Kim, Sang Il Yoon, Sung Wook Baik, Surveillance Abnormal Activity Recognition Using Residual Deep Bidirectional LSTM Network, KINGPC, 2024.07
3. Waseem Ullah, Samee Ullah Khan, Min Je Kim, Altaf Hussain, **Muhammad Munsif**, Mi Young Lee, Daeho Seo, Sung Wook Baik, Industrial defective chips detection using deep convolutional neural network with inverse feature matching mechanism, KINGPC, 2023.06
4. **Muhammad Munsif**, Haseeb Ali Khan, Minje Kim, Fatema Rahimi, Sana Pareez, Mi Young Lee, Soo-Mi Choi, Jong Weon Lee, A Diverse Viewpoint and Background Benchmark for Aerial Human Action Recognition, KINGPC, 2023.06

#### Pre-Prints

1. Min Je Kim, **Muhammad Munsif**, Altaf Hussain, Hikmat Yar, Sung Wook Baik, Pseudo-labeling driven refinement of benchmark object detection datasets via analysis of learning patterns, [arXiv:2506.00997](#), 2025

2. Amjid Ali, Zulfiqar Ahmad Khan, Altaf Hussain, **Muhammad Munsif**, Adnan Hussain, Sung Wook Baik, AVAR-Net: a lightweight audio-visual anomaly recognition framework with a benchmark dataset, [arXiv:2510.13630](#), 2025
3. **Muhammad Munsif**, Waqas Ahmad, Amjid Ali, Mohib Ullah, Adnan Hussain, Sung Wook Baik, Multi-camera connected vision system with multi-view analytics: a comprehensive survey, [arXiv:2510.09731](#), 2025

## PATENTS

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1. Sung Wook Baik, Min Je Kim, **Muhammad Munsif**, Altaf Hussain, Deep Learning-Based Refinement of Benchmark Datasets for Object Detection, 2025, Application Number: 10-2023-0067500
2. Sung Wook Baik, Min Je Kim, **Muhammad Munsif**, Hikmat Yar, Method and Device for Proposing Multi-Stage Candidate Regions Based on Neural Network Structure Search for Object Detection, 2025, Application Number: DP250272
3. Sung Wook Baik, **Muhammad Munsif**, Noman Khan, Altaf Hussain, Min Je Kim, Method for Dark-Adaptive Infrared-Based Activity Recognition in Industrial Applications, 2024, Application Number: DP250031
4. Sung Wook Baik, Mi Young Lee, **Muhammad Munsif**, Samee Ullah Khan, Noman Khan, Min Je Kim, [Method for Predicting Energy Production and Consumption Data Using Convolutional Neural Network Conversion Model](#), 2023, Application Number: 1020230067500

## AWARDS

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<b>Fully Funded Master's and Ph.D Scholarship</b> Sejong University, Seoul, South Korea	Sep 2021 – Feb 2026
<b>BK21 Four Scholarship from National Research Foundation of Korea</b> Sejong University, Seoul, South Korea	Sep 2023 – Feb 2026
<b>Fully Funded Bachelor's Degree Scholarship from Higher Education Commission of Pakistan</b> Islamia College Peshawar, Pakistan	Jan 2018 – Sep 2020
<b>Laptop Award under Prime Minister's Laptop Scheme for Outstanding Students</b> Higher Education Commission of Pakistan	2019

## SKILLS & COMPETENCIES

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<b>Academic Skills</b>	Manuscript Writing, Research Proposal Writing, Conference Presentations, Curriculum Development, Student Mentoring, Collaborative Research, Project Management, Peer Review
<b>Research Skills</b>	Machine Learning & Deep Learning, Computer Vision, Object Detection, Neural Architecture Search, Image Processing, Data Analysis, Statistical Modeling, Experimental Design, Literature Review, Grant Writing
<b>Technical Expertise</b>	Python, MATLAB, C++, TensorFlow, PyTorch, Keras, OpenCV, scikit-learn, NumPy, Pandas, Unity 3D, and Unreal Engine
<b>Development Tools</b>	Git/GitHub, Docker, Linux/Unix, High-Performance Computing (HPC), Edge Devices (Raspberry Pi and Jetson Nano), Cloud Computing (AWS/Google Cloud), LaTeX, Overleaf
<b>Languages</b>	<b>English</b> (Fluent - Professional Working Proficiency), <b>Urdu</b> (Native), <b>Pashto</b> (Native)

## PROFESSIONAL CERTIFICATIONS

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### Deep Learning Specialization

DeepLearning.AI (Andrew Ng) | Coursera, [Credential ID: H8BWY9ZVC3HZ](#)

5-course specialization covering Neural Networks, CNNs, RNNs, Transformers, and ML Strategy

**Structuring Machine Learning Projects**DeepLearning.AI | Coursera [Credential ID: JXD39GC96RDS](#)**Machine Learning**Stanford University (Andrew Ng) | Coursera, [Credential ID: 2RRNLVJBBCNW](#)**Introduction to XR: VR, AR, and MR Foundations**Unity Technologies | Coursera, [Credential ID: FJUD5JAUA6RN](#)**Advanced Writing**University of California, Irvine | Coursera, [Credential ID: 9SQD7N5UVLJD](#)**PROFESSIONAL MEMBERSHIPS & SCHOLARLY REVIEW CONTRIBUTIONS**

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**IEEE (Institute of Electrical and Electronics Engineers)**

2023 – Present

Student Member | Member ID: 99765745

Active engagement in peer review, conferences, and professional development

**MSCA Postdoctoral Fellowship Evaluator**

2024 – Present

Marie Skłodowska-Curie Actions (MSCA), European Commission

NeuroInsight Programme, Royal College of Surgeons in Ireland

Evaluated 3+ fellowship proposals for competitive EU research funding

**Active Reviewer for Leading International Journals and Conferences**

2023 – Present

Total Reviews Completed: 100+ across top-tier venues in AI, Computer Vision, and Engineering

- IEEE Transactions on Image Processing (2+)
- IEEE Transactions on Industrial Informatics (2+)
- IEEE Transactions on Intelligent Transportation Systems (4+)
- IEEE Transactions on Circuits and Systems for Video Technology (2+)
- IEEE Conference on Computer Vision and Pattern Recognition (CVPR) (2+)
- Engineering Applications of Artificial Intelligence, Elsevier (9+)
- Expert Systems with Applications, Elsevier (6+)
- Knowledge-Based Systems, Elsevier (11+)
- Neurocomputing, Elsevier (7+)
- Pattern Recognition, Elsevier (2+)
- Neural Networks, Elsevier (5+)
- Information Sciences, Elsevier (1+)
- Computer Vision and Image Understanding, Elsevier (1+)