Dr. Sunder Ali Khowaja

Personal Data

Name:	Dr. Sunder Ali Khowaja
Gender:	Male
Date of Birth:	17 September 1986
Address:	9 The Elms, The Demesne, Citywest, Dublin 24
email:	sunder.ali@ieee.org
Website:	Personal Webpage, Google Scholar, Publons Reviewer Profile

Work Experience

04/12/2023–Present	Assistant Lecturer, Department of Computer Science, Technological University (TU) Dublin, Ireland
26/03/2018–30/11/2023	Assistant Professor at Department of Telecommunication Engineering, University of Sindh, Jamshoro, Pakistan
01/10/2021–31/03/2022	Postdoctoral Research Fellow, Department of Mechatronics Engineering, Tech University of Korea, Republic of Korea
29/07/2011–26/03/2018	Lecturer at Department of Telecommunication Engineering, University of Sindh, Jamshoro, Pakistan
13/12/2010–15/07/2011	Network Engineer - Projects New Horizon IT Ltd, Karachi, Pakistan
12/05/2008–09/09/2010	System Support Engineer Comstar ISA Ltd., Karachi, Pakistan

Scientific Education

22/02/2016 - 22/02/2019	**Doctor of Philosophy Ph.D.**, Industrial & Information Systems Engineering Hankuk University of Foreign Studies, Republic of Korea Thesis: Sequential Combination of Inception-ResNet & Long-Short Term Memory (SR-LSTM) based Semantic Image Networks for Human Action Recognition Advisor: Prof. Seok-Lyong Lee
01/01/2012 - 10/11/2014	**Masters in Engineering**, Communication Systems & Networks Mehran University of Engineering and Technology, Pakistan CGPA: 3.8 Advisor: Prof. Mukhtiar Ali Unar
27/12/2003 - 31/12/2007	**Bachelors in Engineering**, Telecommunication Engineering Mehran University of Engineering and Technology, Pakistan CGPA: 3.32 Advisor: Engr. Tufail Waseer

Scholarships and Awards

April 2024	Received Best Workshop Paper Award at IEEE WCNC 2024
March 2024	Secured 10th Position in NTIRE BCIE Challenge at IEEE CVPR 2024
July 2023	Completed AI for Social Good Certification from Coursera
Jun 2023	Secured 3rd Position in UG2+ Target Coded Restoration Challenge at CVPR 2023
Jun 2023	Secured 8th Position in PBVS TISR Competition (Track 1) at CVPR 2023
Jun 2023	Secured 7th Position in PBVS TISR Competition (Track 2) at CVPR 2023
Jun 2023	Secured 12th Position in NTIRE Image Denoising Challenge at CVPR 2023
Jun 2023	Secured 8th Position in NTIRE Image SuperResolution Challenge at CVPR 2023
Aug 2022	Completed Google Data Analyst Professional Certification from Coursera
Jun 2022	Secured 2nd Position in UG2+ Competition (Track 3) at CVPR 2022
Jun 2022	Secured 12th Position in NTIRE Competition (Track 3) at CVPR 2022
Jun 2022	Secured 4th Position in PBVS Competition (Track 2) at CVPR 2022
Dec 2021	Completed Generative Deep Learning with Tensor Flow Course from Coursera
Sep 2021	Secured Postdoctoral research fellowship at Tech University of Korea
Dec 2020	Completed Natural Language Processing Specialization from Coursera
Aug 2020	Funding Approved for 3 Bachelors projects from NGIRI Ignite
Jul 2020	Completed Deep Learning Specialization from Coursera
Jan 2019	Delivered a seminar on Reinforcement Learning at HUFS, Republic of Korea
Nov 2018	Best Paper Award at Korea DataBase Conference (KDBC) 2018
Feb 2016	Secured Foreign Students Scholarship for Ph.D. at HUFS, Republic of Korea

Publications

S. A. Khowaja, P. Khuwaja, K. Dev, W. Wang, L. Nkenyereye, Chatgpt needs spade (sustainability, privacy, digital divide, and ethics) evaluation: A review, *Cognitive Computation*, 2024.

R. Liu, K. Guo, X. Li, K. Dev, **S. A. Khowaja**, T. A. Tsiftsis, H. Song. RIS-Empowered Satellite-Aerial-Terrestrial Networks With PD-NOMA. *IEEE Communication Surveys and Tutorials*, 2024.

S. A. Khowaja, P. Khuwaja, K. Dev, K. Singh, L. Nkenyereye, D. Kilper. ZETA: ZEro-Trust Attack Framework with Split Learning for Autonomous Vehicles in 6G Networks. *IEEE Wireless Communications and Networking Conference*, 2024.

S. A. Khowaja, L. Nkenyereye, P. Khuwaja, K. Dev, D. Niyato. SLIP: Self-Supervised Learning Based Model Inversion and Poisoning Detection-Based Zero-Trust Systems for Vehicular Networks. *IEEE Wireless Communications*, 2024.

S. A. Khowaja, S. Almakdi, M. A. Memon, P. Khuwaja, A. Sulaiman, A. Alqahtani, A. Shaikh, A. Alghamdi. Extending User Control for Image Stylization using Hierarchical Style Transfer Networks. *Heliyon*, 2024.

M. Zawish, F. A. Dharejo, **S. A. Khowaja**, S. Raza, S. Davy, K. Dev, P. Bellavista. AI and 6G into the metaverse: Fundamentals, challenges and future research trends. *IEEE Open Journal of the Communications Society*, 2024.

K. Dev, **S. A. Khowaja**. Guest Editorial DENSE-Data Integrity, Integration and Security Issues for Consumer Data in Industry 5.0. *IEEE Transactions on Consumer Electronics*, 2023.

G. Mujtaba, **S. A. Khowaja**, M. A. Jarwar, J. Choi, E. S. Ryu. FRC-GIF: Frame Ranking-based Personalized Artistic Media Generation Method for Resource Constrained Devices. *IEEE Transactions on Big Data*, 2023.

S. A. Khowaja, P. Khuwaja, K. Dev, A. Antonopoulos, M. Magarini. DASTAN-CNN: RF Fingerprinting for the Mitigation of Membership Inference Attacks in 5G. *IEEE Globecom*, 2023.

S. Zeb, A. Mahmood, **S. A. Khowaja**, K. Dev, S. A. Hassan, M. Gidlund, P. Bellavista. Towards defining industry 5.0 vision with intelligent and softwarized wireless network architectures and services: A survey. *Journal of Network and Computer Applications*, 2023.

S. A. Khowaja, P. Khuwaja, F.A. Dharejo, S. Raza, I.H. Lee, R.A. Naqvi, K. Dev. ReFuSeAct: Representation Fusion using Self-Supervised Learning for Activity Recognition in Next Generation Networks. *Information Fusion*, 2023.

S. A. Khowaja, K. Dahri, I. H. Lee, M. A. Jarwar. Spike learning based privacy preservation of Internet of Medical Things in Metaverse. *IEEE Journal of Biomedical and Health Informatics*, 2023.

S. A. Khowaja, P. Khuwaja, K. Dev, A. Antonopoulos, M. Magarini. DASTAN-CNN: RF Fingerprinting for the Mitigation of Membership Inference Attacks in 5G. *IEEE Globecom 2023* (Accepted paper)

Li, Xhang, Timofte, and **others**. NTIRE 2023 challenge on image super-resolution (x4): Methods and results. *IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshop (CVPRW)*, 2023.

Li, Xhang, Timofte, and **others**. NTIRE 2023 challenge on image denoising: Methods and results. *IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshop (CVPRW)*, 2023.

D. Xu, C. Peng, W. Wang, K. Dev, **S. A. Khowaja**, Y. Tian. Multi-keyword Ranked Search Scheme Supporting Extreme Environments for the Internet of Vehicles. *IEEE Internet of Things Journal*, 2023.

S. A. Khowaja, P. Khuwaja, K. Dev, A. Antonopoulos. SPIN: Simulated Poisoning and Inversion Network for Federated Learning-Based 6g Vehicular Networks. *IEEE International Conference on Communications*, 2023.

G. Raja, G. Saravanan, S. B. Parthiba, Z. Akhtar, **S. A. Khowaja**, K. Dev. Smart Navigation and Energy Management Framework for Autonomous Electric Vehicles in Complex Environments. *IEEE Internet of Things Journal*, 2023.

S. A. Khowaja, P. Khuwaja, K.Dev, M.A.Jarwar. PROMPT: PROcess Mining and Paravector Tensor based Physical Health Monitoring Framework. *IEEE Sensors*, 2022.

M. Peng, J. Hu, H. Lin, X. Wang, P. Liu, K. Dev, **S. A. Khowaja**, N. W. M. F. Qureshi. Spatiotemporal Prediction Based Intelligent Task Allocation for Secure Spatial Crowdsourcing in Industrial IoT *IEEE Transactions on Network Science and Engineering*, 2022.

S. A. Khowaja, P. Khuwaja, K. Dev, I. H. Lee, W. Khan, W. Wang, N. W. M. F. Qureshi, M. Magarini. A secure data sharing scheme in Community Segmented Vehicular Social Networks for 6G. *IEEE Transactions on Industrial Informatics*, 2022.

F. A. Dharejo, M. Zawish, F. Deeba, Y. Zhou, K. Dev, **S. A. Khowaja**, N. W. M. F. Qureshi. Multimodal-Boost: Multimodal Medical Image Super-Resolution Using Multi-Attention Network With Wavelet Transform. *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, 2022.

S. A. Khowaja, I. H. Lee, K. Dev, M. A. Jarwar, N. W. M. F. Qureshi. Get your Foes Fooled: Proximal Gradient Split Learning for Defense against Model Inversion Attacks on IoMT data. *IEEE Transactions on Network Science and Engineering*, 2022.

S. A. Khowaja, S. L. Lee. Skeleton-based human action recognition with sequential convolutional-LSTM networks and fusion strategies. *Journal of Ambient Intelligence and Humanized Computing*, 13, 2022.

S. A. Khowaja, K. Dev, P. Khuwaja, Q. V. Pham, N. W. M. F. Qureshi, P. Bellavista, M. Magarini. IIFNet: A Fusion based Intelligent Service for Noisy Preamble Detection in 6G. *IEEE Network*, 36(3), 2022.

B. D. Deebak, F. H. Memon, **S. A. Khowaja**, K. Dev, W. Wang, N. W. M. F. Qureshi. In the Digital Age of 5G Networks: Seamless Privacy-Preserving Authentication for Cognitive-Inspired Internet of Medical Things. *IEEE Transactions on Industrial Informatics*, 2022

S. A. Khowaja, K. Dev, N. W. M. F. Qureshi, P. Khuwaja, L. Foschini. Toward Industrial Private AI: A Two-Tier Framework for Data and Model Security. *IEEE Wireless Communications*, 29(2), 2022.

B. D. Deebak, F. H. Memon, K. Dev, **S. A. Khowaja**, W. Wang, N. W. M. F. Qureshi. TAB-SAPP: a trust-aware blockchain-based seamless authentication for massive IoT-enabled industrial applications. *IEEE Transactions on Industrial Informatics*, 2022.

R. Yang, R. Timofte, M. Zheng, Q. Xing, M. Qiao, M. Xu, L. Jiang, H. Liu, Y. Chen, Y. Ben, X. Zhou, C. Fu, P. Cheng, G. Yu, J. Li, R. Wu, Z. Zhang, W. Shang, Z. Lv, Y. Chen, M. Zhou, D. Ren, K. Zhang, Z. Wangmeng, O. Pavel, V. Dmitry, S. Soltanayev, S. Chervontsev, M. Zhussip, Z. Xueyi, Y. Youliang, M. P. Navarrete, L. Yunhua, Z. Diankai, L. Shaoli, G. Si, W. Biao, Z. Chengjian, Z. Xiaofeng, L. Kaidi, W. Ning, C. T. Nguyen, B. Thong, W. Qing, S. Xiaopeng, M. Haoyu, Z. Shijie, L. Junlin, X. Liangbin, S. Shuwei, Y. Yujiu, W. Xintao, G. Jinjin, D. Chao, S. Xiaodi, N. Chunmei, J. Dong, L. Jucai, X. Zhihuai, Y. Mao, L. Dengyan, P. Liuhan, C. Shengjie, L. Xin, W. Qian, L. Xin, L. Boyang, D. Hang, H. Yuhao, C. Kai, G. Xingbei, S. Yujing, W. Huilei, W. Pengxu, H. Yulin, C. Junying, I. H. Lee, **S. A. Khowaja**, J. Yoon. NTIRE 2022 Challenge on Super-Resolution

and Quality Enhancement of Compressed Video: Dataset, Methods and Results. *IEEE Computer Vision and Pattern Recognition Workshop (CVPRW)*, 2022.

Q. Wang, X. Li, S. Bhatia, Y. Liu, L.T.Alex, **S.A.Khowaja**, V.G.Menon. UAV-Enabled Non-Orthogonal Multiple Access Networks for Ground-Air-Ground Communications. *IEEE Transactions on Green Communications and Networking*, 6(3), 2022.

B.D.Deebak, F.H.Memon, **S.A.Khowaja**, K.Dev, W.Wang, N.M.F.Qureshi, C.Su. Lightweight Blockchain Based Remote Mutual Authentication for AI-Empowered IoT Sustainable Computing Systems. *IEEE Internet of Things Journal*, 2022.

F.A.Dharejo, M.Zawish, Y.Zhou, S.Davy, K.Dev, **S.A.Khowaja**, Y.Fu, N.M.F.Qureshi. FuzzyAct: A Fuzzy-based Framework for Temporal Activity Recognition in IoT Applications using RNN and 3D-DWT. *IEEE Transactions on Fuzzy Systems*, 2022.

B.D.Deebak, F.H.Memon, X.Cheng, K.Dev, J.Hu, **S.A.Khowaja**, N.M.F.Qureshi, K.H.Choi. Seamless privacy-preservation and authentication framework for IoT-enabled smart eHealth systems. *Sustainable Cities and Society*, 80, 2022.

B.D. Deebak, F.H. Memon, K.Dev, **S. A. Khowaja**, N.M.F.Qureshi. AI-enabled privacy-preservation phrase with multi-keyword ranked searching for sustainable edge-cloud networks in the era of industrial IoT. *Ad Hoc Networks*, 125, 2022.

D. K. Soother, S. M. Ujjan, K. Dev, **S. A. Khowaja**, N. A. Bhatti, T. Hussain. Towards soft real-time fault diagnosis for edge devices in industrial IoT using deep domain adaptation training strategy. *Journal of Parallel and Distributed Computing*, 160, 2022.

S.A.Khowaja, P.Khuwaja, K.Dev, P. Bellavista. Towards Energy Efficient Federated Learning for Aerial Base Stations and IoT Devices in 6G and Beyond Networks. *IEEE Wireless Communications*, 28(6), 2021.

D.Liu, Y.Zhang, W.Wang, K.Dev, **S. A. Khowaja**. Flexible Data Integrity Checking with Original Data Recovery in IoT-Enabled Maritime Transportation Systems. *IEEE Transactions on Intelligent Transportation Systems*, 2021.

M.A.Jarwar, **S.A.Khowaja**, K.Dev, M.Adhikari, S.Hakak. NEAT: A Resilient Deep Representational Learning for Fault Detection using Acoustic Signals in IIoT Environment. *IEEE Internet of Things Journal*, 2021.

G. Kumar, S. Basri, A. A. Imam, **S. A. Khowaja**, L. F. Capretz, A. O. Balogun. Data Harmonization for Heterogeneous Datasets: A Systematic Literature Review. *Applied Sciences*, 11(17), 2021.

S.A.Khowaja, P. Khuwaja, K.Dev, G.D.Aniello. VIRFIM: an AI and Internet of Medical Things-driven framework for healthcare using smart sensors. *Neural Computing and Applications*, 2021.

S.A.Khowaja, S.L.Lee, B.N.Yahya. CRCNN: Cascaded and Recursive ConvNets: A Flexible approach for Image Denoising. *Signal Processing: Image Communication*, 99, 2021.

H.Wang, X.Li, R.H.Jhaveri, T.R.Gadekallu, M.Zhu, T.A.Ahanger, **S.A.Khowaja**. Sparse Bayesian learning based channel estimation in FBMC/OQAM industrial IoT networks. *Computer Communications*, 176, 2021.

P.Khuwaja, **S.A.Khowaja**, and K.Dev. Adversarial Learning Networks for Stock Movement Prediction using Heterogeneous Data Sources. *IEEE Internet of Things Journal*, 2021.

K.Dev, **S.A.Khowaja**, P.K.Sharma, B.S.Chowdhry, S.Tanwar, G.Fortino. DDI: A Novel Architecture for Joint Active User Detection and IoT Device Identification in Grant-Free NOMA Systems for 6G and Beyond Networks. *IEEE Internet of Things Journal*, 9(4), 2021.

K.Dev, R.K.Poluru, R.L.Kumar, M.P.K.Reddy, **S.A.Khowaja**. Optimal Radius for Enhanced Lifetime in IoT using Hybridization of Rider and Grey Wolf Optimization. *IEEE Transactions on Green Communications and Networking*, 5(2), 2021.

K. Dev, **S.A.Khowaja**, V. Saini, A.S.Bist, S. Bhatia. Triage of Potential COVID-19 Patients from Chest X-ray Images using Hierarchical Convolutional Networks. *Neural Computing and Applications*, 2021.

S.A.Khowaja, P.Khuwaja. Q-learning and LSTM based Deep Active Learning Strategy for Malware Defense in Industrial IoT Applications. *Multimedia Tools and Applications*, 80, 2021.

S.A.Khowaja, A.G.Prabono, F.Setiawan, B.N.Yahya, S.L.Lee. Towards Soft Real-Time Stress Detection using Wrist-Worn Devices for Human Workspaces. *Soft Computing*, 25, 2020.

S.A.Khowaja, B.N.Yahya, S.L.Lee. CAPHAR: Context-Aware Personalized Human Activity Recognition using Associative Learning in Smart Environments. *Human-Centric Computing & Information Sciences*, 10, 2020.

F.Setiawan, A.G.Prabono, **S.A.Khowaja**, K.Park, W.Kim, B.N.Yahya, J.P.Hong, S.L.Lee. Fine-Grained Emotion Recognition: Fusion of Physiological Signals and Facial Expressions on Spontaneous Emotion Corpus. *International Journal of Ad Hoc and Ubiquitous Computing*, 35(3), 2020.

M. Waseem, **S.A.Khowaja**, R.K.Ayyasamy, F.Bashir. Face Recognition for Smart Door Lock System using Hierarchical Network. *International Conference on Computational Intelligence (ICCI)*, 2020.

S.A.Khowaja, S.L.Lee. Hybrid and hierarchical fusion networks: a deep cross-modal learning architecture for action recognition *Neural Computing and Applications*, 32, 2020.

S.A.Khowaja, S.L.Lee. Semantic Image Networks for Human Action Recognition. *International Journal of Computer Vision*, 128, 2019.

P.Khuwaja, **S.A.Khowaja**, I. Khoso, I.A.Lashari. Prediction of stock movement using phase space reconstruction and ELMs. *Journal of Experimental & Theoretical Artificial Intelligence*, 32(1), 2019.

S.A.Khowaja, P.Khuwaja, I.A.Ismaili. A Framework for Retinal Vessel Segmentation from Fundus Images using Hybrid Feature Set and Hierarchical Classification. *Signal, Image and Video Processing*, 13(2), 2019.

S.A.Khowaja, A.G.Prabono, F.Setiawan, B.N.Yahya, S.L.Lee. Contextual Activity Based Healthcare Internet of Things, Service, and People (HIoTSP): An Architectural Framework for Healthcare Monitoring using Wearable Sensors. *Computer Networks*, 145(9), 2018.

S.A.Khowaja, S.L.Lee. Human Action Recognition with Sequential Convolutional and Recurrent Neural Networks using 3D Skeleton Data. *Korea DataBase Conference (KDBC)*, 2018.

F.Setiawan, **S.A.Khowaja**, A.G.Prabono, B.N.Yahya, S.L.Lee. A Framework for Real-time Emotion Recognition Based on Human ANS using Pervasive Device. *IEEE 42nd Annual Computer Software and Applications Conference (COMPSAC)*, 2018.

M.Khokhar, S.Talpur, **S.A.Khowaja**. A Novel Curvature Feature Embedded Level Set Method for Image Segmentation of Coronary Angiograms. *World Conference on Information Systems and Technologies*, 2018.

S.A.Khowaja, B.N.Yahya, S.L.Lee. Hierarchical Classification Method based on Selective Learning of Slack Hierarchy for Activity Recognition Systems. *Expert Systems with Applications*, 88, 2017.

A.G.Prabono, F.Setiawan, **S.A.Khowaja**, B.N.Yahya, S.L.Lee. ETL Workflow Design for Analyzing Relationship of Empathy with Social Awareness using Socio-Emotion Data. *Korea Software Congress*, 2017.

S.A.Khowaja, A.G.Prabono, F. Setiawan, B.N.Yahya, S.L.Lee. Towards Anomaly Detection system using Wearable Sensors. *Korea DataBase Conference (KDBC)*, 2017.

R.A.Shah, **S.A.Khowaja**, B.S.Chowdhary, S.Shah. Energy Efficient Mobile User Tracking System with Node Activation Mechanism using Wireless Sensor Networks. *IEEE International Conference on Communication, Computing and Digital Systems (C-CODE)*, 2017.

S.A.Khowaja, F.Setiawan, A.G.Prabono, B.N.Yahya, S.L.Lee. An Effective Threshold Based Measurement Technique for Fall Detection using Smart Devices. *International Journal of Industrial Engineering: Theory, Applications, and Practice*, 23(5), 2016.

S.A.Khowaja, B.N.Yahya, S.L.Lee. Evaluation of Features for Classifying Low-Level Human Activities on Larger Datasets. *Korea Computer Congress*, 2016.

S.A.Khowaja, M.A.Unar, I.A.Ismaili, P.Khuwaja. Supervised Method for Blood Vessel Segmentation from Coronary Angiogram Images using 7-D Feature Vector. *The Imaging Science Journal*, 64(4), 2016.

S.A.Khowaja, K.Dahri, M.A.Kumbhar, A.M.Soomro. Facial Expression recognition using Two-Tier Classification and its Application to Smart Home Automation System. *IEEE International Conference on Emerging Technologies (ICET)*, 2015.

Editorial and Organizational Experience

2024	Editorial member at IEEE Metaverse Newsletter.
2024	TPC member for ECAI (European Conference on Artificial Intelligence).
2024	Guest Editor at IEEE Open Journal of the Communication Society.
2024	Guest Editor at IEEE Transactions on Consumer Electronics
2024	Guest Editor at IEEE Transactions on Green Communications and Networking
2023	Editorial Board Member/Section Editor PLoS One
2023	Guest Editor at IEEE Transactions on Vehicular Technology
2022	Guest Editor at IEEE Transactions on Consumer Electronics
2022	Guest Editor at Journal of King Saud University: Computer and Information Sciences
2022	TPC member for NetMan6G workshop at IEEE Globecom.
2022	TPC member for BC4TAI workshop at IEEE Conference on Blockchain
2022	TPC member at International Conference on Sustainable Technologies for Industry 4.0
2022	Guest Editor at Sustainable Energy Technologies and Assessment
2021	TPC member for TCB6GN workshop at IEEE CCNC
2021	TPC member for 6GABS workshop at ACM MobiCom
2021	TPC member for NetMan6G workshop at IEEE Globecom
2021	Guest Editor at Computer and Electrical Engineering

Project Supervision

Co-Supervised 03 Masters in Engineering Students at MUET and UoS Jamshoro, Pakistan
Currently Supervising 02 M.Phil. and 01 Ph.D. Student(s)
Supervised and Co-supervised 40+ Bachelors Projects from 2011 - 2022