Dr. Sibghatullah Inayatullah Khan

Electronics and Communication Engineering · Signal Processing and Artificial Intelligence · Wireless Communication and IoT Systems

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Scopus Publications	**30+**	**GS Citations**	**620+**	**h-index (GS)**	**13**
WoS Publications	**19**	**i10-index (GS)**	**16**	**h-index (Scopus)**	**11**

PERSONAL DETAILS

Nationality: Indian
English: IELTS Academic 6.5 overall (Speaking 7.5), valid to February 2027; all teaching delivered in English since 2017
Qualifications: B.E., M.E. and Ph.D., all through regular, full-time, on-campus study | **Availability:** one-month notice period

PROFESSIONAL SUMMARY

Associate Professor of Electronics and Communication Engineering with more than nine years of full-time teaching and research in higher education, all in English, and Associate Dean (Research) at my institute since 2023. I hold a Ph.D. in Electronics Engineering (Biomedical Signal Processing) and teach a broad range of undergraduate and postgraduate courses: communication systems, wireless and fibre optic communication, computer and communication networks, Internet of Things (IoT), digital signal processing, electronic circuits, machine learning and deep learning. I build applied, hands-on laboratories, including 4G LTE and 5G NR labs on open-source tools and interactive fibre optic network labs, and I have delivered telecom consultancy and industry training onsite in Muscat, Oman. Student feedback on my courses averages above 95% and pass rates are above 95%. My research applies signal processing and artificial intelligence (AI) to real sensor data, with first-author papers in *IEEE Transactions on Artificial Intelligence*, *IEEE Transactions on Human-Machine Systems*, *Expert Systems with Applications* and *Biomedical Signal Processing and Control*. I am Principal Investigator on three funded projects, hold a granted patent on an IoT-based monitoring system, and serve as Associate Editor of *Traitement du Signal* and Academic Editor of *PLOS Digital Health*.

AREAS OF EXPERTISE

- **Signal processing:** digital signal processing, time-frequency analysis (Fourier-Bessel series expansion based empirical wavelet transform, EMD, VMD, wavelets), multichannel and multirate signal processing, physiological signals (EEG, ECG, EMG, heart and lung sounds).
- **Artificial intelligence and machine learning:** machine learning, deep learning, feature engineering and selection, metaheuristic optimization, computer vision and image processing, leakage-free model validation, AI for healthcare and industrial inspection.
- **Communication systems and networks:** analog and digital communication, OFDM, wireless and mobile communication (4G LTE, 5G NR RAN and core), satellite and optical fibre communication, computer networks and TCP/IP protocols.
- **IoT and embedded systems:** IoT system architecture and sensor-to-cloud design, cloud computing (AWS), Raspberry Pi and Arduino prototyping, low-power digital design (VLSI arithmetic circuits, FFT and FIR architectures).

EDUCATION

Doctor of Philosophy (Ph.D.), Electronics Engineering (Biomedical Signal Processing) *2014 – 2018*
Sant Gadge Baba Amravati University, India (public state university; research centre: Babasaheb Naik College of Engineering, Pusad) | Regular, Full-time, awarded 05 Jul 2018

Thesis: Study of signal processing techniques involving human body acoustics for preliminary detection of some disease in telemedicine applications. *Supervisor:* Dr. Vasif Ahmed.

Master of Engineering (M.E.), Digital Electronics *2010 – 2012*
Sant Gadge Baba Amravati University, India (Babasaheb Naik College of Engineering, Pusad) | CGPA 8.64/10, Regular, Full-time

Bachelor of Engineering (B.E.), Electronics and Telecommunication Engineering *2004 – 2007*
Sant Gadge Baba Amravati University, India (Babasaheb Naik College of Engineering, Pusad) | 65.6%, Regular, Full-time

Other: Qualified GATE in 2007 and 2010.

PROFESSIONAL EXPERIENCE

Associate Professor, Department of Electronics and Communication Engineering *Jul 2018 – Present*
Sreenidhi Institute of Science and Technology, Hyderabad, India | Full-time

- Teach and develop undergraduate and postgraduate courses in English across communication systems, networks, IoT, signal processing, electronics and AI, with lectures, laboratory sessions, tutorials and projects.
- Student feedback averaged 95.7% over 25 course offerings (2018-19 to 2024-25) and ranged from 92% to 100% in the last three years; pass rate above 95% in every course, including 98.3% in Advanced Communications Networks (2025-26).
- Prepare course files, laboratory exercises and assessments mapped to course and programme outcomes, and review results and student feedback each semester as part of the department quality assurance and accreditation cycle.
- Supervise undergraduate capstone projects and postgraduate dissertations; provide academic advising and career guidance to students.

Associate Dean (Research) (additional charge) *Sep 2023 – Present*
Sreenidhi Institute of Science and Technology, Hyderabad, India

- Lead institute research policy: revised the R&D incentive policy and the publication APC reimbursement policy; set annual publication norms by faculty rank.
- Run the internal seed research grant scheme, support faculty with research proposals and publication, and compile research data for accreditation and quality assurance reports.

AICTE Industry Fellow *Sep 2025 – Feb 2026*
JK Tyre and Industries Ltd., India (full-time deputation)

Applied computer vision and data analysis to industrial tyre inspection, including wheel alignment verification and OCR-based document matching.

Assistant Professor, Department of Electronics and Telecommunication Engineering *Jul 2017 – Mar 2018*
St. Vincent Pallotti College of Engineering and Technology, Nagpur, India | Full-time

TEACHING, CURRICULUM AND LABORATORY DEVELOPMENT

Courses taught (undergraduate): Analog and Digital Communication; Wireless, Satellite and Fibre Optic Communication; Computer Networks; Advanced Communications Networks; Introduction to Internet of Things; Cloud Computing with AWS; Signals and Systems; Digital Signal Processing; Digital Image Processing; Electronic Devices and Circuits; Linear and Digital Integrated Circuits; Control Systems; Machine Learning; Deep Learning; Artificial Neural Networks; Python Programming.
Courses taught (postgraduate): Advanced Signal Processing; Signal Processing for Biomedical Applications; Artificial Neural Networks; Research Methodology and English for Research Writing.
Courses I am ready to teach: Communication Systems; Wireless and Mobile Communication; Telecommunication Networks; Optical Fibre Communication; Data Communication and Computer Networks; IoT and Embedded Systems; Digital Signal Processing; Electronic Circuits; Digital Electronics; Artificial Intelligence; Machine Learning; Deep Learning; Computer Vision.
Laboratory and teaching material development:

- Designed and conducted hands-on laboratories for 4G/5G cellular networks on open-source tools (OpenAirInterface, free5GC, Wireshark, MATLAB 5G Toolbox): NR physical layer simulation, protocol stack traces, and registration and authentication signalling.
- Designed a five-day interactive fibre optic network lab set (link loss budget, OTDR and power-meter testing, WDM/PON, FTTH design) for diploma-level students, and Jupyter notebook labs for machine learning and computer vision courses.
- Authored complete lecture decks for Artificial Neural Networks (Units I to III) and set external question papers with evaluation schemes (Advanced IoT).
- Every course I teach includes working MATLAB or Python code, so that students build, run and test what they learn.

CONSULTANCY AND INDUSTRY TRAINING

- **Telecom training consultant (onsite), OHI IITC, Muscat, Oman**, through MerQ Technologies, Hyderabad, 8 – 27 Feb 2025: 5G wireless communications and networks for telecom operator engineers.
- **4G and 5G LTE/NR RAN Engineering Training Programme** (20 days, 2026): designed and delivered labs on the NR physical layer, L2/L3 protocol stack (MAC, RLC, PDCP, RRC), RAN procedures and mobility, MATLAB 5G Toolbox and OpenAirInterface.
- **Mastering Computer Vision** (5 days), Global Knowledge, for oil and gas professionals in Oman: Python notebooks, YOLO, U-Net and R-CNN labs, and a seismic fault segmentation capstone.
- **Fibre optics laboratory training** (5 days, 2026) for diploma students: optical links, connectors and splicing, OTDR testing, WDM/PON and FTTH network design, with a graded capstone.

SUPERVISION AND EXAMINATION

- Co-supervisor of one Ph.D. scholar (Godavari University, ongoing).
- Supervised 10 M.Tech dissertations and more than 40 B.Tech capstone projects, including an EEG imagined speech classification project with a working demonstration.
- External question paper setter, with scheme of evaluation, for the M.Tech course Advanced IoT.

RESEARCH GRANTS (PRINCIPAL INVESTIGATOR)

- EEG-driven Assessment of Anxiety and Emotional Dysregulation in Young Adults, institute seed research grant, INR 3,30,000 (sanctioned Nov 2025, 12 months).
- CNN-Based Vehicular Traffic Classification, institute grant, INR 1.22 lakh (2022 – 2024).
- Signal-based Diagnostic System for Decision Support, institute grant, INR 1.02 lakh (2018 – 2019).

PATENTS

- IoT-Based Environment Monitoring System and Method Thereof, Indian Patent IN202241013926 (granted 25 Mar 2022).
- Respiratory Mask Assembly with CPAP Equipment, Indian Patent Application IN202221010903 (published 18 Mar 2022).

PUBLICATIONS

25 journal articles, 11 conference papers, 1 book and 1 book chapter, 2 patents. Quartiles are Scopus/SJR. † marks papers I presented in person.

Journal articles

[J1] **S. I. Khan**, A. B. Raju, K. Gondi, P. C. R. Alla, S. G. Bani, S. Sridevi, "Automated detection of Alzheimer's disease and MCI from EEG signals using astrophysics-inspired features and hybrid feature selection," *Biomedical Signal Processing and Control*, vol. 126, 110935, 2026. (Q1)

[J2] R. Raghupathy, S. M. D. Mathuravalli, **S. I. Khan**, K. K. Thyagharajan, "An effective method for predicting cervical cancer risk using semantic-preserved GANs," *Journal of Circuits, Systems and Computers*, 2650201, 2026. (Q3)

[J3] S. Z. Rahman et al. (co-author **S. I. Khan**), "Automated detection of Alzheimer's disease from EEG signals using VMD driven multi domain features and rich and poor optimization enhanced classification," *Journal of Circuits, Systems and Computers*, 2026. (Q3)

[J4] **S. I. Khan**, R. B. Pachori, "Automated posterior myocardial infarction detection from VCG and derived VCG signals using MVFBSE-EWT method," *Digital Signal Processing*, vol. 163, 105244, 2025.

[J5] S. S. Masalvad, **S. I. Khan**, A. Yadav, "Rainfall prediction comparison between Holt Winter's and LSTM, a deep learning technique," *Iranian Journal of Science and Technology, Transactions of Civil Engineering*, 2025. (Q2)

[J6] G. G. Kumar, **S. I. Khan**, G. P. Acharya, S. K. S. M., "Low-error fixed-width Booth multiplier using approximation of carry function," *Journal of Applied Science and Engineering*, vol. 28, no. 10, 2025. (Q3)

[J7] **S. I. Khan**, R. B. Pachori, "Automated bundle branch block detection using multivariate Fourier-Bessel series expansion based empirical wavelet transform," *IEEE Transactions on Artificial Intelligence*, vol. 5, no. 11, pp. 5643–5654, 2024. (Q1)

[J8] C. Moorthy, J. C. Sekhar, **S. I. Khan**, G. Agrawal, "Optimized brain tumor identification via graph sample and aggregate-attention network with Artificial Lizard Search Algorithm," *Knowledge-Based Systems*, vol. 302, 112362, 2024. (Q1)

[J9] **S. I. Khan**, R. B. Pachori, "Automated eye movement classification based on EMG of EOM signals using FBSE-EWT technique," *IEEE Transactions on Human-Machine Systems*, vol. 53, no. 2, pp. 346–356, 2023. (Q1)

[J10] S. Mian Qaisar, **S. I. Khan**, K. Srinivasan, M. Krichen, "Arrhythmia classification using multirate processing metaheuristic optimization and variational mode decomposition," *Journal of King Saud University – Computer and Information Sciences*, vol. 35, no. 1, pp. 26–37, 2023. (Q1)

[J11] S. Mian Qaisar, **S. I. Khan**, D. Dallet, R. Tadeusiewicz, P. Pławiak, "Signal-piloted processing metaheuristic optimization and wavelet decomposition based elucidation of arrhythmia for mobile healthcare," *Biocybernetics and Biomedical Engineering*, vol. 42, no. 2, pp. 681–694, 2022. (Q1)

[J12] **S. I. Khan**, S. Mian Qaisar, R. B. Pachori, "Automated classification of valvular heart diseases using FBSE-EWT and PSR based geometrical features," *Biomedical Signal Processing and Control*, vol. 73, 103445, 2022. (Q1)

[J13] **S. I. Khan**, S. B. Choubey, A. Choubey, A. Bhatt, P. V. Naishadhkumar et al., "Automated glaucoma detection from fundus images using wavelet-based denoising and machine learning," *Concurrent Engineering*, vol. 30, no. 1, pp. 103–115, 2022.

[J14] G. G. Kumar, **S. I. Khan**, M. M. Basha, "Energy efficient FIR filter design using distributed arithmetic," *Journal of Shanghai Jiao Tong University (Science)*, 2022.

[J15] **S. I. Khan**, R. B. Pachori, "Automated classification of lung sound signals based on empirical mode decomposition," *Expert Systems with Applications*, vol. 184, 115456, 2021. (Q1)

[J16] **S. I. Khan**, R. B. Pachori, "Derived vectorcardiogram based automated detection of posterior myocardial infarction using FBSE-EWT technique," *Biomedical Signal Processing and Control*, vol. 70, 103051, 2021. (Q1)

[J17] **S. I. Khan**, R. B. Pachori, "Automated detection of posterior myocardial infarction from vectorcardiogram signals using FBSE-based EWT," *IEEE Sensors Letters*, vol. 5, no. 5, pp. 1–4, 2021. (Q2)

[J18] M. M. Basha, S. Gundala, **S. I. Khan**, "Design of energy and EDP efficient 1-bit full subtractor based divider circuits for computing systems," *Int. J. of System of Systems Engineering*, vol. 11, no. 3-4, pp. 257–267, 2021. (Q4)

[J19] **S. I. Khan**, G. G. Kumar, P. V. Naishadkumar, S. P. S. Rao, "Analysis of normal and adventitious lung sound signals using EMD and central tendency measure," *Traitement du Signal*, vol. 38, no. 3, pp. 731–738, 2021.

[J20] G. G. Kumar, **S. I. Khan**, M. M. Basha, "Area and power efficient pipeline FFT architecture for QPSK-OFDM," *Int. J. of Advanced Trends in Computer Science and Engineering*, 2019.

[J21] G. K. Ganjikunta, **S. I. Khan**, M. M. Basha, "A high-performance signed-unsigned multiplier using Vedic mathematics," *Journal of Low Power Electronics*, vol. 15, no. 3, pp. 302–308, 2019.

[J22] **S. I. Khan**, V. Ahmed, M. M. Basha, G. G. Kumar, "Preliminary diagnosis of coronary artery disease from human heart sounds: a signal processing prospective," *Int. J. of Advanced Trends in Computer Science and Engineering*, 2019.

[J23] **S. I. Khan**, M. M. Basha, S. J. Badashah, "Preliminary detection of lung diseases in pediatric population using soft computing," *Int. J. of Recent Technology and Engineering*, 2019.

[J24] **S. I. Khan**, V. Ahmed, "Study of adventitious lung sounds of paediatric population using ANN approach," *Int. J. of Current Research and Review*, vol. 9, no. 9, pp. 37–45, 2017.

[J25] **S. I. Khan**, N. P. Jawarkar, V. Ahmed, "Preliminary detection of respiratory disorders for rural children using modified stethoscope," *Int. J. of Computer Applications*, pp. 11–14, 2012.

Conference papers

[C1] G. G. Kumar, **S. I. Khan**, M. M. Basha, M. Mudda, L. P. Yarrapathni, "Real-time road surface analysis for pothole detection," *ITM Web of Conferences*, vol. 74, 03001, 2025.

[C2] G. G. Kumar, **S. I. Khan**, M. M. Basha, M. Mudda, "Multisensory approach for stopped vehicle detection on highways to enhance collision prevention," *2nd Int. Conf. on Self Sustainable Artificial Intelligence Systems*, 2024.

[C3] **S. I. Khan**, S. Mian Qaisar, A. López, H. Nisar, F. Ferrero, "EEG signal based schizophrenia recognition by using VMD rose spiral curve butterfly optimization and machine learning," *IEEE Int. Instrumentation and Measurement Technology Conf. (I2MTC)*, 2023.

[C4] M. Asrar, J. Bawazir, **S. I. Khan**, S. Mian Qaisar, "Heart disease identification based on butterfly optimization and machine learning," *Int. Conf. on Smart Computing and Application (ICSCA)*, pp. 1–7, 2023.

[C5] M. M. Ahmad, **S. I. Khan**, "Three-tier authentication and secure key exchange over insecure channel," *Int. Conf. on Big Data Analytics and Computational Intelligence (ICBDAC)*, 2017. †

[C6] **S. I. Khan**, V. Ahmed, N. P. Jawarkar, "Application of signal processing techniques for preliminary detection of adventitious lung sounds in paediatric population using electronic stethoscope," *ICBDAC*, 2017. †

[C7] **S. I. Khan**, V. Ahmed, "Study of effectiveness of Stockwell transform for detection of coronary artery disease from heart sounds," *2nd Int. Conf. on Contemporary Computing and Informatics (IC3I)*, 2016. †

[C8] **S. I. Khan**, V. Ahmed, "Investigation of some features for preliminary detection of coronary artery disease using electronic stethoscope," *Int. Conf. on Emerging Trends in Communication Technologies (ETCT)*, 2016. †

[C9] **S. I. Khan**, V. Ahmed, "Classification of pulmonary crackles and pleural friction rubs using MFCC statistical parameters," *Int. Conf. on Advances in Computing, Communication and Automation (ICACCA)*, 2016. †

[C10] **S. I. Khan**, V. Ahmed, "Study of electronic stethoscope as prospective analysis tool for cardiac sounds," *Smart Trends in Information Technology and Computer Communications (SmartCom)*, 2016. †

[C11] **S. I. Khan**, N. P. Jawarkar, V. Ahmed, "Cell phone based remote early detection of respiratory disorders for rural children using modified stethoscope," *Int. Conf. on Communication Systems and Network Technologies (CSNT)*, IEEE, 2012. †

Book and book chapter

[B1] **S. I. Khan**, R. B. Pachori, "Empirical wavelet transform-based framework for diagnosis of epilepsy using EEG signals," in *AI-Enabled Smart Healthcare Using Biomedical Signals*, 2022.

[B2] **S. I. Khan**, V. Ahmed, *Signal Processing Methods for Human Lung Sound Analysis: Exploration with Some Popular Algorithms*, book, 92 pp., 2020.

CONFERENCES, SEMINARS AND INVITED TALKS

- Presented papers in person at CSNT 2012, IC3I 2016, ETCT 2016, ICACCA 2016, SmartCom 2016 and ICBDAC 2017 (two papers).
- Invited speaker, AICTE VAANI programme: two lectures on soft computing and nature-inspired optimization and on quantum-inspired computing for signal and data processing (17 Sep 2026); lecture on machine learning pipelines for AI-enabled diagnosis (CVR College of Engineering, Hyderabad, 6 Nov 2026).

PROFESSIONAL DEVELOPMENT

- Online Research Training for Outside Faculty Members, Department of Electrical Engineering, IIT Indore, mentor Prof. Ram Bilas Pachori (Sep – Nov 2020).
- AICTE Industry Fellowship, JK Tyre and Industries Ltd. (Sep 2025 – Feb 2026).
- Self-directed training in 5G NR physical layer, OpenAirInterface and 5G core networks (2026).

COMMITTEES, LEADERSHIP AND QUALITY ASSURANCE

- Associate Dean (Research): lead the institute research office, research policy, seed grant scheme and publication norms (since Sep 2023).
- Contributed research and teaching data to institutional accreditation and quality assurance processes; maintain course files with outcome mapping and semester-wise review.
- Prepared Special Issue proposals for three journals (neuroadaptive human-computer interaction, human-AI interaction, multimodal affective computing).

EDITORIAL WORK AND PEER REVIEW

- Associate Editor, *Traitement du Signal* (since 2023); Academic Editor, *PLOS Digital Health* (since Sep 2026).
- Reviewer for *IEEE Transactions on Systems, Man, and Cybernetics*, *Expert Systems with Applications* and *Biomedical Signal Processing and Control*.

COLLABORATION AND PARTNERSHIPS

- International research collaboration with Dr. Saeed Mian Qaisar (American University of the Middle East, Kuwait) and co-authors in Europe and Asia: five co-authored papers.
- National collaboration with Prof. Ram Bilas Pachori, Indian Institute of Technology Indore, on time-frequency methods: seven journal papers and a book chapter.
- Industry partnerships through consultancy and training in Oman (telecom and oil and gas sectors) and the AICTE Industry Fellowship in India.

COMMUNITY ENGAGEMENT

- Public lectures in Hindi, Urdu and English under the AICTE VAANI regional-language programme (2026).
- Training of diploma-level students in fibre optic networks (2026).

AWARDS AND MEMBERSHIPS

- Research Excellence Award, Sreenidhi Institute of Science and Technology, four consecutive years (2020 – 2024).
- Fellow, Institution of Electronics and Telecommunication Engineers (IETE); Member, IEEE.

TECHNICAL SKILLS AND LANGUAGES

Programming and AI: Python (scikit-learn, PyTorch, TensorFlow), MATLAB, LaTeX; Jupyter notebooks.
Telecom, networking and IoT tools: OpenAirInterface, free5GC, MATLAB 5G Toolbox, Wireshark, AWS cloud services, Raspberry Pi, Arduino.
Languages: English (fluent), Urdu and Hindi (native), Marathi (fluent), Arabic (basic).

REFERENCES

Available on request.