

## **Faculty Profile**



**Dr. Usha Rani T, M.Tech., Ph.D**  
Associate Professor/BME

### **HIGHLIGHTS:**

- Number of Journal Publications: 30
- H-Index: 7
- i-10 Index: 6
- Patents Published: 22

### **PROFESSIONAL LINKS:**

- Scopus ID: 57214330109
- Scopus Link: <https://www.scopus.com/authid/detail.uri?authorId=57214330109>
- Anna University Faculty ID: -
- AICTE Faculty ID: -
- Anna University Supervisor ID: -
- LinkedIn: <https://www.linkedin.com/in/uscharani-thirunavukkarasu-4a1bb341/>

### **PROFESSIONAL BACKGROUND:**

- Teaching Experience till date: 11 years
- Industrial Experience: -

### **INTERNATIONAL EXPOSURE:**

- Presented Research paper in the International Conference on Advanced Technology in Engineering and Management, Siam University, Bangkok, 2025.

### **AREA OF SPECIALIZATION:**

- Thermal Imaging
- Non-Invasive Diagnostics
- Biomedical Imaging and Signal Processing
- Biomedical Instrumentation

### **Ph.Ds GUIDING:**

- Full Time Scholars: -
- Part Time Scholars: -

### **PATENTS PUBLISHED/GRANTED:**

- AMMO MIST - Ammonia Sensor for Aquariums (Published - 202441041294).
- Biofilm with PH indicator (Published - 202441041290).
- BSNDDB - A Database created on Bare Lymphocytes Syndrome (Published-202441041310).
- Column Bioabsorbent for waste water Reclamation purpose (Published - 202441053760).
- Dr. Disinfect: Portable and Cost effective solution for nosocomial infection and prevention (Published - 202441053706).
- Fetal Heart Rate Monitoring System (Published 2024410538).
- Guardian Dose Dispenser - Trusted Digital Pill Management (Published - 202441041291).
- Herbal Hair Elixir (Published - 202441061371).
- Hair Serum (Published - 202441061150).
- Hydrogel for Gardening (Published - 202441041314).
- Lab Scale Ferment (Published - 202441041268)
- Equipment for Laundry Wastewater Reclamation (Published - 202441041299).
- MSDP: A database created on muscular dystroph (Published - 202441041312).
- Nano Selenium coated starch based edible packing material (Published - 202441053761).
- PICADB - A database created on PICA Syndrome (Published - 202441041320).
- Enhanced Rectangular Photobioreactor with integrated cell harvesting system (Published 202441041292).
- Respitrack (Published - 202441053828).
- Ayurvedic Deep Cleansing Shower Gel for Dry Skin (Published 202441061152).
- Equipment for degradation of pollutant - UV Photoreactor (Published - 202441041274).
- Vaginal Wipes (Published - 202441061151).
- An Intelligent Advisory System Based on Image Processing to Teeth Diseases Diagnosis (Published - 202241008447).
- Intelligent Brain Actuated Wheel Chair (Published-202041050106).

### **COURSES CERTIFIED:**

- Completed the online courses from Great Learning titled “Digital Image Processing”, “Image Processing Projects”, and “AI in Healthcare”.
- Completed the NPTEL course titled "Medical Image Analysis", from IIT Kharagpur.
- Completed the certified course titled "Image Processing", from MATHWORKS.
- Completed the certified course titled "Pacemakers and ECG", from MEDTRONIC Academy.

### **ACHIEVEMENTS AND AWARDS:**

- Recognized for publishing a Top-Cited Article in CAAI Transactions on Intelligence Technology, 2025.
- Recognized as one of the top ten papers at the 16th International Engineering and Computing Research Conference held at Taylor's University, Malaysia, 2021.
- Received the Academic Ambassador Award from Abinnovus Consultancy Private Ltd in 2023.
- Received the Breakthrough Discovery Award from Agastiyar Research & Technologies in 2023.
- Ranked third overall in undergraduate studies and recognized as the Department Topper.

- Selected as one of the shortlisted candidates in the Project Contest'12 organized by the Indian Society of Technical Education (ISTE) in 2012.

#### **SPECIAL SESSIONS DELIVERED:**

- Served as Session Chair at the International Conference held at Galgotias University, 2024.
- Served as Session Chair at the International Conference on Recent Advancements in Biomedical Engineering, Bharath University, 2021.

#### **CONFERENCES/SEMINARS/WORKSHOPS/JOURNALS:**

- Usharani Thirunavukkarasu, “Plantar Thermography as an Early Indicator of Prediabetes: A Pilot Study”, presented in International Conference on Advanced Technology in Engineering and Management, Siam University, Thailand, July 2025.
- Rakesh Kumar Mahendran, Kalaiyarasi B, Krithik Karan K, Usharani Thirunavukkarasu, “AD-OCT: An Early Alzheimer Disease Detection Method via OCT Images using Advanced Feature Extraction and Clustering Techniques”, presented in IEEE International Conference on Emerging Research in Computational Science (ICERCS), Karpagam Academy of Higher Education; Madras Section, December 2024.
- Rakesh Kumar Mahendran, Parthasarathy Ramadass, M Kiruthiga Devi, R Sanmugasundaram, Usharani Thirunavukkarasu, “HiAt-Net: A Novel Three-Layered Encoder-Decoder with Hierarchical Attention for Classifying Cervical Cancer with Cytology Images”, presented in IEEE International Conference on Intelligent Systems and Advanced Applications, Dr. D.Y. Patil Institute of Technology, October 2024.
- Huma Shankar, and Usharani Thirunavukkarasu, “Exploratory Analysis of Fetal Health Classification Using Machine Learning Algorithms”, presented in International Conference on New Horizons in Bioengineering: Fostering Academia-Industry Partnership (ICB), SRM Institute of Science and Technology, Feb 2024.
- Shanmugapriya, and Usharani Thirunavukkarasu, “Prediction of Gestational Diabetes Mellitus using Visceral Fat Measurements”, presented in International Conference on New Horizons in Bioengineering: Fostering Academia-Industry Partnership (ICB), SRM Institute of Science and Technology, Feb 2024.
- Kunali, and Usharani Thirunavukkarasu, “Prediction of Diabetic Retinopathy Signs in Diabetes and Healthy Subjects using Debrecen Datasets by Comparing NB and KNN Classifiers”, presented in International Conference on Advanced Computing and Ingenious Technologies in Engineering Science, Galgotias College of Engineering and Technology, India, Dec – 2021.
- Sravanthi, and Usharani Thirunavukkarasu, “Image Segmentation of Brain Tumor Images using Fuzzy algorithm in comparison with Region based segmentation algorithm”, presented in International Conference on Advanced Computing and Ingenious Technologies in Engineering Science, Galgotias College of Engineering and Technology, India, Dec – 2021.
- Umakanth, and Usharani Thirunavukkarasu, “Classification of Benign and Malignant Tumor cells using Bagging and Adaboost classifiers from Wisconsin dataset for the Potential Diagnostic Application”, presented in International Conference on Advanced Computing and Ingenious Technologies in Engineering Science, Galgotias College of Engineering and Technology, India, Dec – 2021.
- Yashwanth, and Usharani Thirunavukkarasu, “Classification of Benign and Malignant Masses using LMT and RF Classifiers for the Potential and Diagnostic Applications”, presented in International Conference on Advanced Computing and Ingenious Technologies in Engineering Science, Galgotias College of Engineering and Technology, India, Dec – 2021.
- Chandana Srija, and Usharani Thirunavukkarasu, “Classification of Normal and Nodule Lung Images from LIDC-IDRI datasets Using K-NN and Logistic Classifiers”, presented

in International Conference on Emerging Trends in Materials, Computing and Communication Technologies, Annai Vailankanni College of Engineering, India, Dec – 2021.

- Usharani Thirunavukkarasu, “Evaluation Analysis based on Breast Cancer Awareness and its Associating Knowledge among the University Technical and Medical Field Associated Female Students by Random Distribution”, presented in 16th Eureka 2021: 16th International Engineering and Computing Research Conference, Taylor’s University, Malaysia, Nov – 2021.
- Usharani Thirunavukkarasu, and Snehalatha Umapathy, “Classification of Prediabetes and Healthy Subjects in Plantar Infrared Thermal Imaging Using Various Machine Learning Algorithms”, presented in International Conference on Micro-Electronics and Telecommunication Engineering, Sep - 2019.
- Ramji Kalidoss, Snehalatha Umapathy, and Usharani Thirunavukkarasu, “An array of Reduced Graphene oxide/SnO<sub>2</sub> binary nanocomposite gas sensors for acetone detection in exhaled breath towards the diagnosis of diabetes” presented in International Conference on Nanoscience and Nanotechnology, Aug - 2019.
- Usharani Thirunavukkarasu, Snehalatha Umapathy, Ramji Kalidoss, Ravi Chandran Thirunavukkarasu, and Kumar Janardanan “Thermal Imaging in Plantar Region: An Assessment Tool for Early Detection of Foot Complications in Type II Diabetes Mellitus” presented in International conference on BioMaterials, BioEngineering and BioTheragnostics, July – 2018.
- Ramji Kalidoss, Snehalatha Umapathy, and Usharani Thirunavukkarasu, “Diagnosis of Diabetes Mellitus via Feature Extraction of Exhaled Breath Print by means of an array of Graphene based gas sensors” presented in International conference on BioMaterials, BioEngineering and BioTheragnostics, July - 2018.
- Usharani Thirunavukkarasu, Anburajan Mariamichael, and Ravichandran Thirunavukkarasu, “Non Invasive In-vivo Method for Blood Glucose Measurement”, presented in National Conference on recent trends in Electrical and Electronics Engineering, May - 2014.
- Webinar series on advances in bio-sensing technologies, organized by SRM Institute of Science and Technology, during 17th and 18th February 2022.
- Seminar on Recent trends in Machine learning for Neuroimaging, organized by CSIR and IFET College of Engineering, during 29th and 30th November 2021.
- Workshop on Artificial Intelligence in Software Fault Prediction, organized by SRM Institute of Science and Technology, during 28th and 29th October 2021.
- Workshop on Biomimetic Scaffolds Fabrication for Tissue Engineering using Novel Electrospinning strategies, organized by Binghamton University, during 24th June 2021.
- Workshop on Powder Bed Fusion Additive Manufacturing of Aluminum Parts with Curved Surface Structures, organized by Binghamton University, during 10th June 2021.
- Webinar on Innovation and Patent: A Pathway to Intellectual Property, organized by Santhiram Engineering College, during 29th May 2021.
- Webinar on Machine learning in Healthcare Applications, organized by Binghamton University, during May 7th 2021.
- Online Workshop on How to Publish Research Articles with High Impact Factor Powered by Web of Science organized by the Department of Electronics and Communication Engineering, SRM Institute of Science and Technology in association with Institution ‘s Innovation Council (Ministry of HRD initiative) Government of India during 30th July 2020.
- IEI sponsored Workshop on Machine Learning for Intelligent Speech and Image Processing (MLSIP-2018) organized by the Department of Electronics and Communication Engineering, SRM Institute of Science and Technology during 28-29th September 2018.

- National level workshop on Effective Writing of Engineering Journal Paper and Thesis organized by the Department of Electrical and Electronics Engineering, SRM Institute of Science and Technology during 16-17th March 2017.
- Technical Symposium on Present and Future of Healthcare Instrumentation: Clinical & Technology Perspective organized by National Hub for Healthcare Instrumentation Development, Anna University during 30th January 2016.
- Workshop on Principles and Applications of Nanoscience and Nanotechnology organized by Science City, Government of Tamil Nadu during 7-9th September 2016.
- Workshop on Software Safety and Security of Medical Devices organized by Center of Medical Electronics, CEG, Anna University in association with LDRA Academic Alliance Programme during 30th September 2016.
- Workshop on Maintenance of Hospital Equipments organized by the Department of Biomedical Engineering, Velalar College of Engineering and Technology in association with Advanced Training Institute for Electronics and Process Instrumentation (Govt. of India) during 20-21st January 2012.
- Workshop on Solar Photo Voltaics organized by Ministry of Micro Small and Medium Enterprises - Development Institute (MSME-DI) , Government of Tamil Nadu during 6-7th October 2008.
- STTP on Artificial Intelligence organized by Sanskrithi School of Engineering, during 24th to 28th May 2021.
- STTP on Deep Learning and its Application on NLP, Image and Video Analysis organized by Department of Software Engineering, SRM Institute of Science and Technology during 5-9th February 2019.
- Five days FDP on Advances in Biomedical Engineering, Healthcare Innovation, and Research Data Automation: A Global Perspective at Easwari Engineering College during 30th June to 5th July 2025.
- Five days FDP on Various Facets of Technology in Healthcare at Saveetha Engineering College during 24th to 28th February 2025.
- Five days FDP on Recent Advances in Renewable Energy for Sustainable Development at AMET University during 20th to 24th January 2025.
- Six days FDP on Harnessing Artificial Intelligence for Healthcare Excellence: Innovation, Insights, and Impacts at SRMIST, Ramapuram during 24th to 29th June 2024.
- Five days FDP on Advanced Research in Biomedical Engineering, at Saveetha Engineering College during 29th to 2nd February 2024.
- Six days FDP on Emerging Paradigms in Biomedical Healthcare Applications, at Sathyabama Institute of Science and Technology during 18th to 23rd December 2023.
- Five days FDP on Modern Medical Instrumentation organized by SRM Institute of Science and Technology, during 4th to 8th December 2023.
- Four days FDP on Radiological Equipments, at Hindusthan College of Engineering and Technology during 8th to 12th May 2023.
- Three days FDP on Advances in Signal Processing and its Applications, organized by Vellore Institute of Technology from 20th to 23rd March 2023.
- Six days FDP on Nanotechnology in Biomedical Applications, organized by Karpagam Academy of Higher Education during 13th to 18th March 2023.
- Six days FDP on Exploring the Future Endeavors in the Biomedical Technology, organized by Eswari Engineering College from 18th to 24th January 2023.
- Six days FDP on Biomechanics and its Applications, at SRM Institute of Science and Technology during 13th to 18th March 2023.
- Six days Professional Development Programme on 3D Bioprinting and its Applications, at Karpagam Academy of Higher Education from 12th to 17th December 2022.
- Six days FDP on Emerging Technologies in Biomedical-Healthcare Applications, at Sathyabama Institute of Science and Technology during 12th to 17th December 2022.

- FDP on Current trends in machine learning and deep learning: A hands-on approach, organized by Bharathi Vidhyapeeth's College of Engineering, during 26th July to 31st July 2021.
- Six days FDP on Essentials of Outcome based Education, at Dr.MGR Educational and Research Institute, during 15th to 19th March 2021.
- FDP on Research Areas in Biomedical Signal Processing organized by Sri Vasavi Engineering College, during 21st June to 26th June 2021.
- FDP on Essentials of Outcome based Education organized by Dr.MGR Educational and Research Institute, during 15th March, 2021 to 19 th March 2021.
- Faculty Development Program on Machine Learning and Deep Learning organized by the Department of Electronics and Instrumentation Engineering, SRM Institute of Science and Technology during 27-31st May 2020.
- B. Sravanthi, Usharani Thirunavukkarasu., "Retinal image segmentation using fuzzy algorithm in comparison with region-based segmentation algorithm", In AIP Conference Proceedings, Vol. 3270, 020043, No. 1, AIP Publishing, 2025.
- K Vinutha, Usharani Thirunavukkarasu., "Prediction of arrhythmia from MIT-BIH database using multilayer perceptron (MLP) and REP TREE (RT) classifiers", In AIP Conference Proceedings, Vol. 3270, 020041, No. 1, AIP Publishing, 2025.
- Rakesh Kumar Mahendran, Kalaiyarasi B, Krithik Karan K, Usharani Thirunavukkarasu., "AD-OCT: An Early Alzheimer Disease Detection Method via OCT Images using Advanced Feature Extraction and Clustering Techniques", International Conference on Emerging Research in Computational Science (ICERCS), IEEE, 2024.
- Rakesh Kumar Mahendran, Parthasarathy Ramadass, M Kiruthiga Devi, R Sanmugasundaram, Usharani Thirunavukkarasu, A Peter Soosai Anandaraj., "HiAt-Net: A Novel Three-Layered Encoder-Decoder with Hierarchical Attention for Classifying Cervical Cancer with Cytology Images", International Conference on Intelligent Systems and Advanced Applications, IEEE, 2024.
- Thirunavukkarasu, U., Umapathy, S., Ravi, V. and Alahmadi, T.J., "Tongue image fusion and analysis of thermal and visible images in diabetes mellitus using machine learning techniques", Scientific Reports, 14(1), p.14571, 2024. (SCI/I.F: 3.8).
- Vinutha, K. and Thirunavukkarasu, U., "Prediction of arrhythmia from MIT-BIH database using J48 and k-nearest neighbours (KNN) classifiers", In AIP Conference Proceedings, Vol. 2853, No. 1, AIP Publishing, 2024.
- Vinutha, K. and Thirunavukkarasu, U., "Prediction of arrhythmia from MIT-BIH database using support vector machine (SVM) and naive bayes (NB) classifiers", In AIP Conference Proceedings, Vol. 2853, No. 1, AIP Publishing, 2024.
- Koyyala, U. and Thirunavukkarasu, U., "Classification of benign and malignant tumor cells using random tree and knn classifiers from Wisconsin dataset for the potential diagnostic application", In AIP Conference Proceedings, Vol. 2816, No. 1, AIP Publishing, 2024.
- Konreddy, Y.R. and Thirunavukkarasu, U., "Classification of benign and malignant masses using LMT and RF classifiers for the potential and diagnostic applications. In AIP Conference Proceedings, Vol. 2816, No. 1, AIP Publishing, 2024.
- Koyyala, U. and Thirunavukkarasu, U., "Classification of benign and malignant tumor cells using SVM and logistic classifiers from Wisconsin dataset for the potential diagnostic application", In AIP Conference Proceedings, Vol. 2816, No. 1, AIP Publishing, 2024.
- Pillalamarri, K. and Thirunavukkarasu, U., "Prediction of diabetic retinopathy signs in diabetes and healthy subjects using debrecen datasets by comparing NB and KNN classifiers" In AIP Conference Proceedings, Vol. 2816, No. 1, AIP Publishing, 2024.
- Koyyala, U. and Thirunavukkarasu, U., "Classification of benign and malignant tumor cells using bagging and Adaboost classifiers from Wisconsin dataset for the potential

diagnostic application”, In AIP Conference Proceedings, Vol. 2816, No. 1, AIP Publishing, 2024.

- Jyotsna Asari, Usharani Thirunavukkarasu, “Evaluation analysis based on breast cancer awareness and its associating knowledge among the university technical and medical field associated female students by random distribution”, In AIP Conference Proceedings, Vol. 2729, No. 1, AIP Publishing, 2024.
- Reddy, K.Y. and Usharani Thirunavukkarasu, “Classification of benign and malignant masses using J48 and KNN classifiers for the potential and diagnostic applications”, In AIP Conference Proceedings, Vol. 2587, No. 1, AIP Publishing, 2023.
- Srija, G.C. and Usharani Thirunavukkarasu, “Classification of normal and nodule lung images from LIDC-IDRI datasets using K-NN and logistic classifiers”, In AIP Conference Proceedings, Vol. 2587, No. 1, AIP Publishing, 2023.
- Mounika, N. and Usharani Thirunavukkarasu, “Classification of healthy and diabetic mellitus individuals by extracted textural features from left plantar thermograms and classifying using SVM and NB classifiers”, AIP Conference Proceedings, Vol. 2822, No. 1, AIP Publishing, 2023.
- Vinutha, K. and Usharani Thirunavukkarasu, “Prediction of arrhythmia from MIT-BIH database using random forest (RF) and voted perceptron (VP) classifiers”, AIP Conference Proceedings, Vol. 2822, No. 1, AIP Publishing, 2023.
- Arfat Ahmad Khan, Usharani Thirunavukkarasu, Rakesh Kumar Mahendran, Muhammad Faheem, "Epileptic Seizures Prediction Using Adversarial Deep Dual Patch Attention Mechanism", CAAI Transactions on Intelligence Technology, 2023. (SCI/IF: 5.91).
- Konreddy, Y. and Usharani Thirunavukkarasu, “Classification of benign and malignant masses using SVM and VP classifiers for the potential and diagnostic applications. In AIP Conference Proceedings, Vol. 2655, No. 1, AIP Publishing, 2023.
- Gantenapati, C.S. and Usharani Thirunavukkarasu, "Classification of normal and nodule lung images from LIDCIDRI datasets using SVM and NB classifiers", AIP Conference Proceedings Vol. 2655, No. 1, AIP Publishing, 2023.
- Konreddy, Y. and Usharani Thirunavukkarasu, "Classification of benign and malignant masses using SVM and VP classifiers for the potential and diagnostic applications", In AIP Conference Proceedings Vol. 2655, No. 1, AIP Publishing, 2023.
- Rakesh Kumar Mahendran, Prabhu, Parthasarathy, Usharani Thirunavukkarasu, Mary, Jagadesh, “An Energy-Efficient Centralized Dynamic Time Scheduling for Internet of Healthcare Things”, Measurement, 2021 (SCI/IF: 3.91).
- Ramji Kalidoss, Usharani Thirunavukkarasu, Snehalatha Umapathy, “A breathalyzer for the assessment of chronic kidney disease patients’ breathprint: Breath flow dynamic simulation on the measurement chamber and experimental investigation”, Biomedical Signal Processing and Control, 2021 (SCI/IF:3.88).
- Usharani Thirunavukkarasu, Snehalatha Umapathy, Palani Thanaraj Krishnan, and Kumar Janardanan, “Human tongue thermography could be a prognostic tool for prescreening the type II diabetes mellitus” Evidence-Based Complementary and Alternative Medicine, 2020 (SCI/IF: 2.064).
- Usharani Thirunavukkarasu, Snehalatha Umapathy, Kumar Janardhanan, and Ravichandran Thirunavukkarasu, “A computer aided diagnostic method for the evaluation of type II diabetes mellitus in facial thermograms” Physical and Engineering Sciences in Medicine, pp.1-18, 2020 (SCI/IF: 3.3).
- Usharani Thirunavukkarasu, and Snehalatha Umapathy, “Classification of Prediabetes and Healthy Subjects in Plantar Infrared Thermal Imaging Using Various Machine Learning Algorithms” In Micro-Electronics and Telecommunication Engineering (pp. 85-96). Springer, Singapore, 2020 (Scopus).
- A.Jyotsna, Saba Fathima, Mohamed Adil A.A, Shyam Kumar, Usharani Thirunavukkarasu, and Revathi.K, “Study On Breast Cancer Awareness And Knowledge

Among Female University Students Using Self-Administered Questionnaire”, Annals of the Romanian Society for Cell Biology, 631–648, 2020 (Scopus).

- Usharani Thirunavukkarasu, Anburajan Mariamicheal, and Ravichandran T, "Non-Invasive Measurement of Blood Glucose using Constructed Prototype Based on Photoplethysmographic Principle", International Journal of Applied Engineering Research, 10(6), 2015.
- Aparna Prasad, Mohanapriya Paneerselvam, Usharani Thirunavukkarasu, Jebajaculin Bright, and Pradeep Raja, “Development of an Assistive Aid for Speech Impaired” International Journal of Scientific and Research Publications, 2(3), 2012.
- Pradeep Raja, Selvan Selvam, and Usharani Thirunavukkarasu, "A Color - Coded Bracelet Modelling System To Measure Heart Rate Pressure and Drug Level for Sports Application," International Journal of Engineering Research & Technology, 1(3), 2012 (Scopus).

#### **PROFESSIONAL MEMBERSHIPS:**

- Institution in Engineering and Technology (IET)
- International Association of Engineers (IAENG).