Rakesh Kumar Mahendran

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Research Interest

- Early Diagnosis of Diseases
- Multi-modal Medical Image Analysis
- EEG/ECG Signal Processing
- Clinical Outcomes Prediction/ Detection
- Machine Learning/Deep Learning

Education

Anna University **Chennai, Tamil nadu**
Doctor of Philosophy in Information and Communication Eng, Ph.D *Jan 2016 – May 2023*

Anna University **Chennai, Tamil nadu**
Master of Engineering in Computer Science Engineering (with Specialization in Networks),M.Eng. *Jun 2013 – Apr 2015*

Anna University **Chennai, Tamil nadu**
Bachelor of Engineering in Computer Science,B.Eng. *July 2008 – May 2011*

Experience

Assistant Professor cum CSRC Coordinator **Mar 2023–Present**
Department of Computer Science and Engineering/Rajalakshmi Engineering College *Thandalam,Chennai*

Full-Time Researcher **Jan 2016–Mar 2023**
Centre For Research/ Dept of ECE,Veltech Multitech Dr.Rangarajan Dr.Sakunthala Engineering College *Avadi,Chennai*

- Developed a CNN model to test Myocardial Infraction
- Explored ways to visualize and send a daily reports to supervisors.
- Maintained and established laboratory setup.
- Contributed to the writing of research grants
- Explored ways to collaboration with Industries and Academicians
- Ability to work independently to achieve research goals.

PGT-Teaching Assistant **Nov 2011 – Mar 2013**
Computer Science Teacher/Daniel Thomas Mat Hr. Sec School *Arumbakkam,Chennai*

Projects

Classification of Brain Tumor Sub Regions | *Independent Research, Collaboration with VIT University, India* **Ongoing**

- This project accompanied by the extraction of multi-network features through the CNN models (Inception V3, Alexnet, Dense Net-169, VGG19). Performance has been enhanced using Grasshopper Optimization Algorithm as the feature selection technique along with the chi-square test. PLS fused features have been used for classification with the least square SVM (LS-SVM). The proposed technique is tested on the BraTS 2018, and BraTS 2019.

Early Detection of Parkinson's Disease Using MRI | *Independent Research* **Ongoing**

- Analyzing MRI to detect early stage of Parkinson's, we developed a model using SGCNN. To train this model we used MRI data from PPMI dataset. Primary results obtained were promising for prognosis of Parkinson.

Early Detection of Acute Lymphoblastic Leukemia | *Independent Research* **Ongoing**

- To perform automated early detection in a type of leukemia, we developed a Deep learning algorithm. This algorithm used SCNN as feature extractor and classifier. We utilized CNMC-2019 dataset for training and testing the algorithm. Overall, the algorithm outperforms other previous techniques which prove that this can be accessed in hospitals for automated detection

Breast Cancer Histopathology Image Classification | *Independent Research* **Completed**

- Developing a system based on deep learning technique to diagnose automatically the presence of BC, which uses SCNN as feature extractor and Bi-LSTM as classifier. This combination was trained using BACH dataset (histopathology images)

Cervical Cancer Segmentation and Classification | *Independent Research* **Completed**

- Developing a system based on hybrid African Buffalo Based Deep Action Selection Network (ABO:DASN) uses these extracted characteristics to train and classification of a cervical cancer

Technical Skills

Languages: Python, R, C/C++, Java, Matlab, HTML
Frameworks: Monai,TensorFlow,Flask, WordPress
Libraries: Numpy, Scipy, Scikit-learn, Keras, PyTorch, Pandas, Matplotlib
Developer Tools: Google Cloud Platform, VS Code, Visual Studio, PyCharm,Eclipse

Publications

Peer-Reviewed Journal |

- [**AJC'22**]Mary Judith A, S. Baghavathi Priya,Rakesh Kumar Mahendran,Gadekallu, T. R., and Ambati, L. S., Two-phase classification: ANN and A-SVM classifiers on motor imagery BCI, Asian J Control (2022), 1– 12. https://doi.org/10.1002/asjc.2983,2022.**Q2** Journal Impact Factor: **2.444**

- [**SENS'22**]Antony, M.J., Sankaralingam, B.P.,Rakesh Kumar Mahendran,Gardezi, A.A., Shafiq, M., Choi, J.-G., Hamam, H. "Classification of EEG Using Adaptive SVM Classifier with CSP and Online Recursive Independent Component Analysis." Sensors 2022, 22, 7596. https://doi.org/10.3390/s22197596,2022.**Q1** Journal Impact Factor: **3.847**

- [**BSPC'22**]Mary Judith A., S. Baghavathi Priya,Rakesh Kumar Mahendran,"Artifact Removal from EEG signals using Regenerative Multi-Dimensional Singular Value Decomposition and Independent Component Analysis", Biomedical Signal Processing and Control, Vol 74,2022,103452, ISSN 1746-8094, https://doi.org/10.1016/j.bspc.2021.103452,2022.**Q1** Journal Impact Factor: **5.076**

- [**COIN'22**] V.Nehru,V.Prabhu and Rakesh Kumar Mahendran."Denoising and segmentation of brain image by proficient blended threshold and conserve edge scrutinize technique.", Computational Intelligence. 2022; 1- 16. https://doi.org/10.1111/coin.12542,2022.**Q2** Journal Impact Factor: **2.142**

- [**IASC'22**] Navod Neranjan Thilakarathne, G.Muneeswari, V.Parthasarathy, Fawaz Alassery, Habib Hamam,Rakesh Kumar Mahendran and Muhammad Shafiq, "Federated Learning for Privacy-Preserved Medical Internet of Things", Intelligent Automation and Soft Computing.http://doi.org/10.32604/iasc.2022.023763,2022.**Q3** Journal Impact Factor: **3.401**

- [**MEAS'21**] Rakesh Kumar Mahendran,V., Prabhu., Parthasarathy.V., Usharani. T., Mary Judith. A.,Jagadeesan.S, "An energy-efficient centralized dynamic time scheduling for Internet of Healthcare Things", Measurement, 186, 110230. https://doi.org/10.1016/j.measurement.2021.110230.,2021.**Q1** Journal Impact Factor:**5.131**

- [**ETT'21**] Rakesh Kumar Mahendran,Parthasarathy V.,Parthasarathy.R, J.Shanmugapriyan, Prakash Pandian,"An efficient priority based convolutional auto-encoder approach for electrocardiogram signal compression in Internet of Things based healthcare system",Transactions on Emerging Telecommunications Technologies.2020. https://doi.org/10.1002/ett.4115,2021.**Q2** Journal Impact Factor: **3.310**

- [**ENER'21**] Parthasarathy V.,Santhosh Rajendran, Rakesh Kumar Mahendran,Salman Naseer, Muhammad Shafiq, and Jin-Ghoo Choi,"Unmanned Aerial Vehicles (UAV) in Precision Agriculture: Applications and Challenges", Energies, 2022; 15(1):217, https//doi.org/10.3390/en15010217,2022.**Q2** Journal Impact Factor:**3.252.**

- [**EPJS'21**] Sivasaravanababu.S, Prabhu.V, Parthasarathy.V, and Rakesh Kumar Mahendran,"An Efficient Epileptic Seizure Detection Based on Tunable Q-Wavelet Transform and DCVAE-Stacked Bi-LSTM Model using Electroencephalogram", The European Physical Journal Special Topics, https://doi.org/10.1140/epjs/s11734-021-00380-x, 2021,**Q2** Journal Impact Factor: **2.891**

- [**SUST'21**] M.Elhoseny, N.N.Thilakarathne,M.Ibrahim Alghamdi, Rakesh Kumar Mahendran,Abid Gardezi, H.Weerasinghe, A.Welhenge, "Security and Privacy Issues in Medical Internet of Things: Overview, Countermeasures,Challenges and Future Directions", Sustainability, 2021, 13(21), 11645; https://doi.org/10.3390/su132111645,2021.**Q1** Journal Impact Factor: **3.889.**

- [**EIAR'21**] Kun Gao, Prathik Anandhan,and Rakesh Kumar Mahendran,"Analysis and evaluation of the regional air quality index forecasting based on web-text sentiment analysis method", Environmental Impact Assessment Review, Vol.87,ISSN 0195-9255,2021, https://doi.org/10.1016/j.eiar.2020.106514,2021.**Q1** Journal Impact Factor: **6.122**

- [**IJUFK'21**] Suning Gong, Rakesh Kumar Mahendran and Kumutha,D., "Design of Lighting Intelligent Control System Based on OpenCV Image Processing Technology", International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems, 29,119-139,2021,https://doi.org/10.1142/S0218488521400079,2021.**Q3** Journal Impact Factor:**1.027**

- [**IET-ITS'20**] A.Daniel, S.Karthik, BalaAnand Muthu, Newlin Rajkumar, S.Kadry, Rakesh Kumar Mahendran,Sanjeevi Pandian,Procuring Cooperative Intelligence in Autonomous Vehicles for Object Detection through Data Fusion Approach",IET Intelligent Transport Systems,Print ISSN 1751-956X, Online ISSN 1751-9578 2020. https://doi.org/10.1049/iet-its.2019.0784,2022.**Q1** Journal Impact Factor:**2.568**

- [**ETT'20**] Xie, Haiming; Zhou, Jing; Zhang, Peifen; Xi'an Quan Feng Zhi, Rakesh Kumar Mahendran, Parthasarathy. R, "Internet Of Underground Things (IOUT) assisted performance evaluation for underbalanced drilling telemetry systems", Transactions on Emerging Telecommunications Technologies. https://doi.org/10.1002/ett.4039,2021.**Q2** Journal Impact Factor: **3.310**

- **[COMCOM'20]** Rakesh Kumar Mahendran,and Parthasarathy Velusamy,"A secure fuzzy extractor based biometric key authentication scheme for body sensor network in Internet of Medical Things",Computer Communications, ISSN: 0140-3664,Vol: 153, Page: 545-552,2020.https://doi.org/10.1016/j.comcom.2020.01.077,2021.**Q1** Journal Impact Factor: **5.047**

Patents |

- *Emergency Medicine Delivery Transportation using Unmanned Aerial Vehicle*, Australian Grant Innovation Patent, Patent No: 2021103791, Till 2029.
- *Semantics based Intelligent Search Method for Cloud E-healthcare Records*, Australian Grant Innovation Patent,Patent Filled
- *Automated Physical Evaluation and Sports Injury Assessment Using Artificial Intelligence*,Indian Patent,202141042394.

Book/Book Chapters |

- *Navod Neranjan Thilakrathne, Rohan Samarasinghe, and Rakesh Kumar Mahendran,"Security System Design for Medical Big Data: Layered Security Framework for Protecting Medical Big Data"*, Healthcare Big Data Analytics: Computational Optimization and Cohesive Approaches by Walter de Gruyter GmbH, Genthiner Str. 13, 10785 Berlin, Germany. 2022.

Professional Activities

Journal Editorship |

- **Managing Editor-** *International Journal of Wireless and Ad Hoc Communication (IJWAC)*
- **Associate Editor**-*Journal of Intelligent Systems and Internet of Things (JISIoT)*
- **Editorial Board Member** - *Cardiometry*
- **International Editorial Board-**-*Human Research in Rehabilitation (HRR)*

Conference Organizing Committee and Track Chairs |

AICTE Sponsored International Conference on Internet of Things and Its Challenges ICITC-2017,*Vel Tech Multi Tech Dr.Rangarajan Dr.Sakunthala Engineering College* 2017

Reviewer |

- European Radiology Experimental
- IET Wireless Sensor Systems
- Computer Communication
- Multimedia Tools and Applications
- Complex and Intelligent System
- Energy Systems
- European Journal of Remote Sensing
- Transactions on Emerging Telecommunications Technologies
- Inteligencia Artificial
- Computer Applications in Engineering Education
- Fusion: Practice and Applications
- ACM Transactions on Asian and Low-Resource Language Information Processing