Pavan Mohan Neelamraju

Doctoral Researcher | Loughborough University, UK

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EDUCATION

Loughborough University, United Kingdom. **Oct 2025 - Present**
Doctor of Philosophy (PhD), Electrical, Electronics and Systems Engineering
Research Area: Machine Learning for Fault Analysis in Reconfigurable Intelligent Surfaces
Scholarship: Awarded a fully-funded scholarship worth GBP 48,000.

Indian Institute of Technology Madras, India. **Jul 2023 – May 2025**
Masters by Research (MS), Interdisciplinary Research Program CGPA: 8.89/10
Scholarship: GATE Fellowship (Ministry of Education, Government of India)
Thesis: Application of Data-Driven Modelling Frameworks to Spectral Acceleration and Crater Identification

SRM University, India. **Jun 2019 – May 2023**
Bachelor of Technology (B Tech) in Electronics and Communication Engineering Major CGPA: 9.33/10
Silver Medallist with a Minor in AI & ML Minor CGPA: 9.4/10
Thesis: Analysis of Uninterruptible Power Supply critical-to-quality factors

RELEVANT COURSEWORK

Machine Learning, Signal Processing, Applied Electromagnetics, Microwave Engineering, Wireless Communication, Probability and Statistics, Image Processing, Computer Vision, Principles of Soft Computing.

RESEARCH EXPERIENCE AND PROJECTS

Indian Institute of Technology, Madras, India. **Jul 2023 – May 2025**
Master's Thesis: Application of Data-Driven Modelling Frameworks to Spectral Acceleration and Crater Identification.
***Thesis Link*:** https://heyzine.com/flip-book/3f4c11652d.html

- Explored deep learning algorithms, such as Autoencoders, Bi-directional Networks, and Generative Adversarial Networks (GANs), to model ground motion data of past damaging Indian earthquakes.
- Developed ground motion prediction equations and Early Warning Systems to predict both response and Fourier amplitude from magnitude, distance, and soil conditions.
- Utilized machine learning techniques for the synthetic generation of ground motion responses using GANs.
- Compared developed models with traditional mechanistic-based approaches to evaluate the advantages and limitations of machine learning techniques on seismic data and planetary images (Valles Marineris).
- Analysed and modelled large datasets of strong motion data from earthquake-prone regions worldwide.
- Investigated numerical and analytical methods to understand physical processes using planetary images of Mars.

Espanso (Open Source Initiative) **Nov 2026 - Dec 2026**
Contribution: https://hub.espanso.org/libreoffice-ppt-math/

- Developed LibreOffice PPT-Style Math, an Espanso-powered text expansion package that converts LaTeX- and PowerPoint-style math input into readable Unicode as you type in Writer, Impress, and other apps.
- Built support for 900+ math commands, covering Greek letters, operators, relations, arrows, sets, and mathematical alphabets, plus compound notation such as powers, subscripts, integrals, sums, fractions, and roots.
- Designed space-triggered conversion to preserve normal typing, with support for common text patterns, one-key undo, and plain Unicode output that can be copied into documents, email, chat, and PDFs.
- Published the package on Espanso Hub under the MIT license, with installation guidance, a command cheat sheet, troubleshooting notes, and configurable options for LibreOffice-only use and longer expressions.

All India Institute of Medical Sciences, Delhi, India. **Jul 2024 – Oct 2024**
Research Project: Development of Breast Cancer Detecting System Based on Microwave – Antenna – Array - Sensors and Implementation of Internet of Medical Things (IoMT).

- Researched and analysed the feasibility of utilising microwave antenna array sensors for breast cancer detection.
- Designed and developed a prototype system integrating IoMT principles with microwave antenna arrays for real-time data transmission and analysis.
- Optimized the system's hardware and software components to achieve high accuracy and reliability in detecting breast cancer and compared the same with conventional confocal microwave imaging.
- Evaluated the system's effectiveness in sensitivity, specificity, and overall diagnostic accuracy compared to existing diagnostic methods.

- Demonstrated the potential clinical impact and scalability of the developed system for widespread adoption in healthcare settings.
- Established the detection framework by optimizing computational efficiency, storage capability and processing speeds.

Kobe University, Hyogo, Japan. **May 2024 – Jul 2024**
Research Project: Signal Processing and Machine Learning for Denoising Multi-Beam Interference in Digital Holographic Microscopy.

- Explored denoising the multi-beam interference-based digital holographic microscope for live cell imaging.
- Developed and optimized algorithms for effective fringe artefact removal, tailored for small sample sizes.
- Applied advanced algorithms to remove or mitigate identified fringe artefacts and published the Python package online (https://github.com/PavanMohanN/FringeLib).
- Evaluated the effectiveness of the proposed methods using quantitative measures of artefact reduction and qualitative assessment through visual inspection.
- Demonstrated the applicability on real-world microscopic datasets obtained from various experimental setups.

Arab East Colleges, Riyadh, Saudi Arabia. **Dec 2022 – Mar 2023**
Research Project: Evaluation of Multivariate Data Acquisition of Network Embedding Scheme for Healthcare Applications

- Utilized metrics such as precision and recall to evaluate the overall performance of the recommendation system built upon Metapath2Vec.
- Conducted a study using data gathered from 1500 influenza patients to evaluate the effectiveness of the recommendation system.
- Analysed the system's ability to identify distinct trends from disease symptoms perceptible to people.
- Implemented Metapath2Vec and conducted a corresponding analysis to assess its performance and mitigate error propagation in the model.

SRM University, India. **Jun 2022 – May 2023**
Bachelor's Thesis: Analysis of Uninterruptable Power Supply critical-to-quality factors.
***Thesis Link*:** https://heyzine.com/flip-book/04aca861a9.html

- Conducted a comprehensive analysis of Uninterruptible Power Supply (UPS) systems to evaluate performance metrics such as power, runtime, and efficiency, crucial for ensuring reliable electricity supply and system stability.
- Investigated the impact of circuit parameters on UPS runtime and mapped the relationship between key factors like temperature, voltage, and energy storage, providing insights into system lifespan and safety.

PUBLICATIONS

Representative Journals

1. **Neelamraju, P. M**. et al. (2025). Enhanced Seismic Ground Motion Modeling with Conditional Variational Autoencoder. Earthquake Engineering and Resilience. https://doi.org/10.1002/eer2.70006
2. **Neelamraju, P. M.** et al. (2024). Ground Motion Model for Acceleration Response Spectra using Conditional GAN. Natural Hazards. https://doi.org/10.1007/s11069-024-06988-1
3. **Neelamraju, P. M.** et al. (2024). Potential Applications for Photoacoustic Imaging with Nanoparticles. Heliyon. https://doi.org/10.1016/j.heliyon.2024.e34654
4. Gundepudi, K. et al. (2023). Nanotechnology in Near-Infrared Photodetectors: Materials, Performance, Applications. J. Mater. Sci., 58(35), 13889-13924. https://doi.org/10.1007/s10853-023-08876-8
5. **Neelamraju, P. M.,** & Yellampalli, S. (2023). Analysis of UPS Critical-to-Quality Factors. J. Power Electron., 23, 1919-1930. https://doi.org/10.1007/s43236-023-00674-4
6. **Neelamraju, P. M.,** El-Dosuky, M., & Kamel, S. (2023). Multivariate Data Acquisition for Healthcare Applications. J. Theor. Appl. Inf. Technol., 101(12), 4939-4948. Retrieved from https://www.jatit.org/volumes/Vol101No12/8Vol101No12.pdf
7. **Neelamraju, P. M.,** & Pothapragada, P. (2022). Image Processing and Clustering for Forest Cover Quantification. Int. J. Adv. Res. Eng. Technol., 13(6), 12-20. https://doi.org/10.17605/OSF.IO/VF9UN
8. **Neelamraju, P. M. (2021).** Meteorological Drought Assessment in India using ML Techniques. Int. J. Sci. Res., 10(7), 592-598. Retrieved from https://www.researchgate.net/publication/353731540

Conferences

1. **Neelamraju, P.M.,** et al. (2026). An ML-Assisted Recommender for Multi-Shape Patch Antenna Design. In IEEE International Workshop on Antenna Technology (iWAT) 2026, IEEE, pp. 1-4. https://doi.org/10.1109/iWAT66946.2026.11501854
2. **Neelamraju, P. M.,** & Muniraj, I. (2024). SLICE: Super Linear Iterative Clustering and Earth Mover's Distance for Brain Tumour Classification. In Optica Imaging Congress 2024, Optica Publishing Group, p. DW1H.3. [Online].

Available: https://opg.optica.org/abstract.cfm?URI=3D-2024-DW1H.3.

3. **Neelamraju, P. M.** et al. (2024). ARIMA Models for Harvesting Predictions in Telangana Agriculture. In Proceedings of the 2024 International Conference on Numerical Optimization in Engineering and Sciences (NOIEAS). Springer. (Forthcoming)
4. Sameer, M., et al. (2024). Decomposing Economic Indicators: A Study of Compensation, GDP, and Employment Rate in Germany Through Empirical Mode Decomposition. In Proceedings of the 2024 International Conference on Communication and Intelligent Systems (ICCIS). Springer. https://doi.org/10.1007/978-981-96-5726-1_29
5. **Neelamraju, P. M.** et al. (2024). Position Tracking Algorithm via Nearest Neighbour Classifier. In Proceedings of the 2024 2nd International Conference on Emerging Trends in IT and Engineering (ICETITE), IEEE, pp. 1-6. https://doi.org/10.1109/ic-ETITE58242.2024.10493328
6. **Neelamraju, P. M.** et al. (2023). Low-Scale Dipole Antenna Optimization using Bootstrap Aggregation. In Proceedings of the 2nd International Conference on Paradigm Shifts in Communications, Embedded Systems, Machine Learning, and Signal Processing (PCEMS), IEEE, pp. 1-4. https://doi.org/10.1109/PCEMS58491.2023.10136108
7. **Neelamraju, P. M.** et al. (2023). Voting-Based Malaria Parasite Detection System. In Proceedings in Adaptation, Learning and Optimization (Vol. 17, pp. 338-347). Springer. https://doi.org/10.1007/978-3-031-31164-2_28
8. Pothapragada, P., & **Neelamraju, P. M.** (2023). Sensor Fusion-Based Rover for Safe Navigation in Deformed Terrain. In Proceedings of ICIVC 2022, Springer, pp. 348-357. https://doi.org/10.1007/978-3-031-31164-2_29
9. **Neelamraju, P. M.** et al. (2022). Eucalyptus Regnans Form Characteristics. In Proceedings of the 2022 IEEE 11th International Conference on Communication Systems and Network Technologies (CSNT), pp. 329-334. https://doi.org/10.1109/CSNT54456.2022.9787575

Patents

1. **Neelamraju, P. M.,** et al. (2025). Integrated Signal Processing Unit for Frequency Domain Transformation in OFDM Receivers. Indian Patent Application Number *202541076849*.
2. Neelamraju, P., Chinnadurai, S., & **Neelamraju, P. M.** (2024). A system and a method for simulating and analysing surface bioluminescence. Indian Patent Application Number *202441039763*.
3. Pothapragada, P., **Neelamraju, P. M.**, & Ramakrishnan, M. (2023). IoT Healthcare framework for low latency, reliable communication. Indian Patent Application Number *202341075746*.
4. **Neelamraju, P. M.**, et al. (2023). A system and a method for object position tracking and classification. Indian Patent Application Number *202341052891*.

TEACHING AND MENTORSHIP EXPERIENCE

Teaching Assistant (TA), Loughborough University, UK. **Oct – Dec 2026**
Worked as a TA for the course (WSC414).

Teaching Assistant (TA), IIT Madras, India **Jan – May 2025**
Worked as a TA for the course "Seismic Data Analysis" (CE6018) for junior year students. Involved in execution of project-based learning and flipped classroom model.

Teaching Assistant (TA), SRM University, India. **Aug 2022 – Jan 2023**
Worked as a TA in the Department of Electronics and Communication Engineering for the course – "Digital Electronics" (ECE 211) for the sophomores. Involved in designing the lecture material, and conducting tutorial classes and evaluation frameworks.

SKILLS

Programming: Python, R, C, C++, MATLAB.
Hardware: CPUs, GPUs, High-Performance Computing Environment.
Software: CST Studio, TensorFlow, SciPy, PyTorch, OpenCV, Scikit-learn, MS Office, LaTeX.

CONFERENCES AND WORKSHOPS

Conferences

1. 6th International Conference on Frontiers in Computing and Systems (COMSYS 2025), Reviewer, Warsaw University of Technology, Poland, 25-27 September 2025.
2. Optica Imaging Congress 2024, Presenter, Optica, Toulouse, France, 15-19 July 2024.
3. Second International Conference on Emerging Trends in Information Technology and Engineering (ICETITE), Presenter, Vellore Institute of Technology, Tamil Nadu, India, 24-25 February 2024.
4. 4th International Conference on Frontiers in Computing and Systems (COMSYS 2023), Reviewer, Indian Institute of Technology - Mandi, India, 16-17 October 2023.
5. 2nd International Conference on Paradigm Shifts in Communications Embedded Systems, Machine Learning and Signal Processing (PCEMS), Presenter, National Institute of Technology - Nagpur, India, 5-6 April 2023.
6. 2nd International Conference on Intelligent Vision and Computing (ICIVC 2022), Presenter, National Institute of Technology - Agartala, India, 26-27 November 2022.
7. IEEE 11th International Conference on Communication Systems and Network Technologies (CSNT), Presenter, Shri G. S. Institute of Technology and Science, Indore (M.P.), India, 23-24 April 2022.
8. Transition Towards Sustainability of Agriculture: Role of Technology in Agriculture Supply Chain, Presenter, SRM

University – AP, Andhra Pradesh, India, 3-4 June 2021.

Workshops

1. Advanced Optical Communication, Attendee, Indian Institute of Technology - Madras, 22-23 July 2023.
2. Data Analysis using Python, Attendee, Andhra Pradesh State Skill Development Corporation, 16 Nov – 5 Dec 2020.
3. Machine Learning using Python, Attendee, Andhra Pradesh State Skill Development Corporation, 16 Nov – 5 Dec 2020.

INTERNSHIPS

Project Trainee, UST Global (*Industry-Academia Project as Bachelor's thesis*) **Feb 2022 – Sep 2022**

Project: Analysis of Uninterruptable Power Supply Critical-to-Quality Factors

- Conducted thorough analysis of UPS system data using Python libraries like pandas and scikit-learn.
- Developed predictive models for early detection of UPS system failures, reducing compensatory damages.

Intern, UST Global **Jun 2021 – Jul 2021**

Project: Customer Defect Analysis

- Applied NLP techniques to analyse customer feedback and identify recurring issues.
- Developed algorithms to automatically categorize and prioritize customer defects for resolution.
- Utilized Python libraries such as NLTK and spaCy for text preprocessing and analysis.

CERTIFICATIONS

Applied Data Science Specialization, Coursera	Jul 2020
SQL Fundamentals, Coursera	Jul 2020
IBM Data Science, Coursera	Jun 2020
Machine Learning, MathWorks	Mar 2020
MATLAB, MathWorks	Mar 2020
Deep Learning, MathWorks	Mar 2020

AWARDS

GATE Fellowship (Ministry of Education, Govt. of India)	Jun 2023
Silver Medal in Bachelor's, SRM University – AP, 2023 Batch	May 2023
All India Rank in GATE Examination All India Rank 148 in 2022 and 48 in 2023	Mar 2022 & Mar 2023
Gold Medal for the Best Research Presentation among undergraduates	Feb 2022
Two Gold Medals for the Best Research Paper Presentations	Aug 2021
Tata Innoverse Solver Hunt 10 - Monetary Award by Tata Steel	Mar 2021
Gold Medallist – Research Day SRM University	Jan 2021

POSITIONS OF RESPONSIBILITY

Lead, Wolfson School of Mechanical, Electrical and Manufacturing Engineering, Loughborough University.	Oct 2026 - Present
Honorary Member of Board of Studies, SRM University	Oct 2022 – Present
Head, Hostel Mess Committee - IIT Madras	Jul 2024 – May 2025
Coordinator of Research Affairs Council – IIT Madras	Aug 2023 – Aug 2024
Potential Projects Head at SEDS SRM AP Chapter	Apl 2022 – May 2023
Core Team Member of Let's Build Together	Mar 2022 – Mar 2023
Member – Directorate of Student Council – SRM University	Aug 2021 – Aug 2022
Researcher at Next Tech Lab, SRM University	Jul 2019 – May 2023

TESTS AND COMPETITIVE EXAMINATIONS

Graduate Aptitude Test in Engineering, GATE

1. All India Rank: 48 in 2023, among ≈ 517,000 candidates.
2. All India Rank: 148 in 2022 among ≈ 711,542 candidates.

Languages and tests

1. IELTS Academic: Overall Band Score: 8.0/9.0 with individual scores as in - L: 8.0, R:9.0, W:7.0 and S:7.0
2. Deutsch (German): Duolingo Level - 13.
3. Other languages: Telugu, Hindi, and Tamil.