

Dr. LINU PINTO

CONTACT INFORMATION

Assistant Professor
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DOB AND PLACE: 17 September 1986, Ernakulam, India

ACADEMIC POSITIONS

- Cochin University Post Doctoral Fellow, Department of Computer Applications, CUSAT (16 Sept 2022 – 10 Feb 2023)
- Assistant Professor, Department of Mathematics, CUSAT (13 Feb 2023 – till Date)

EDUCATION

- Cochin University of Science and Technology- Ph.D in Mathematics, September 2021
 - Thesis Title - AN ANALYTICAL APPROACH ON THE APPROXIMATIONS OF DEEP NEURAL NETWORK FOR CLASSIFICATION FUNCTIONS IN FUZZY DOMAIN
 - Supervising Guide – Dr. Sasi Gopalan, Professor, Department of Mathematics CUSAT.
- St. Josephs College of Teacher Education for Women- B.Ed in Mathematics (2009-2010)
- Mar- Ivanios College, Thiruvananthapuram- M Sc Mathematics (2007-2009)
- St. Teresas College, Ernakulam- B Sc Mathematics (2004- 2007)

RESEARCH INTERESTS

- Optimization Techniques in Machine Learning and AI
- Optimization and Approximations in Deep Neural Networks

RESEARCH GUIDANCE

No of PhD Scholars :1

Name of the scholar : Tinu John

Date of joining of PhD Scholar: 31/01/2024

Fellowship: MANF

Topic: Advances in Optimization Techniques for Deep Learning

IMSC sixth Semester (2023-2024) students project Guidance

- Krishna K.S
- Vinayak Devesan
- Alphy Devechen
- Sreedev R.

COURSES HANDLED

- MAM 21-803-0401 -Mathematical Methods II (Fourth Semester IMSC, 2022-23)

- MAM 21-803-0608- Metric Topology (Elective)-(Sixth semester IMSC 2022-23)
- MAM 21-803-0301- Calculus II – IMSC (Third semester 2023-2024)
- MAM 2305 TOPICS IN APPLIED MATHEMATICS- MSC (Third semester 2023-2024)
- MAT10611-Introduction to Optimization in Machine Learning- IMSC sixth Semester (2023-2024)
- MAT 2205 - Computational Mathematics Laboratory – MSC second Semester (2023-2024)

PROFESSIONAL ACHIEVEMENTS

- Served as a resource person on *One day Seminar on Applied Mathematics* November 2018, St. Teresa's College Ernakulam.
- Served as a **resource person** on *Faculty Improvement Program* for the faculties at the Department of Mathematics, St Teresa's college Ernakulam on 7th December 2021 on the topic "*Why Mathematical Analysis so important for Machine Learning and Artificial Intelligence*".
- **Invited Speaker** and delivered an invited talk on "*Foundations for Gradient Based Learning in Neural Networks with Linear Algebra*" in the *International conference ICMMAACI-2022* through online mode held during 02-04 March 2022 organized by the Department of Mathematics, *The Gandhigram Rural Institute (Deemed to be University), Gandhigram-624302, Dindigul, Tamil Nadu, India.*
- Served as a **resource person** on *Faculty Improvement Program* for the faculties at the Department of Mathematics, St Teresa's college Ernakulam on 4th March 2022 on the topic "*Foundations of Gradient Optimization in Neural Network*".
- Served as a **resource person** on "Introduction to Optimization Techniques in Machine Learning" in the "Faculty Enrichment Programme" conducted on 22nd and 23rd June, 2023.
- Served as a **resource person** and delivered a lecture on the topic "A Linear Algebraic Approach to Optimization In Machine Learning for Clustering" at Muthoot Institute of Technology and Science, organized by the Math Club on 21" July 2023 for 1 year B. Tech students.
- Served as a **resource person** for the Programme "Msgr. Dr. Thomas Moothedan Memorial Lecture Series" on the topic "Developing AI model for Classification with Gradient Techniques" organized by the Dept. of Mathematics of St. Thomas College (Autonomous), Thrissur on 07/12/2023.
- Served as a **resource person** on the invited talk on Two days National Seminar on Advances in Computational Mathematics on the topic "On the Computational Aspects of Gradient Optimization in Neural Networks " organized by the department of Mathematics, CUSAT, Kerala, India on 21 December 2023.
- Served as a resource person for the invited talk on "Understanding Optimization in Neural Networks with Python "organized by the Dept. of Mathematics Farook College (Autonomous), Calicut on 05/01/2024.
- **Convenor** for the Two days National Seminar on Advances in Computational Mathematics organized by the department of Mathematics, CUSAT, Kerala, India on 21-22 December 2023 as a part of National Mathematics Day Celebrations
- Served as **Resource Person** and delivered a talk on "Enhancing the Efficiency of Neural Network Classification through Optimization Techniques" on the international conference on

“Pure and Applied Mathematics” organized by the Department of Mathematics, RVS college of Arts and Science, Coimbatore on 2nd February 2024.

- Delivered an **invited talk** on “Calculus for Optimization Techniques in Machine Learning” at Department of Mathematics, Aquinas College, EDACOCHIN on 16/02/2024

SYLLABUS PREPARED

- MAT 10511/MAT 10611 - Introduction to Optimization in Machine Learning
- MAT 2205 - Computational Mathematics Laboratory.
- MAT 2319/MAT 2419 – Advanced Optimization Methods and Machine Learning.
- MAT 10404- Basics in Python Programming

ELECTIVES OFFERED

- Introduction to Optimization in Machine Learning – IMSC Sixth Semester
- Advanced Optimization Methods and Machine Learning – MSC Third Semester

RESEARCH PUBLICATIONS (Selected Publications)

- *Pinto, L., Gopalan, S., & Balasubramaniam, P., On the Generalization of Deep Neural Networks with Tychonoff Separation axioms, Information Sciences- Elsevier, 608, 262-285. (SCI indexed with Impact Factor 8.233)*
<https://www.sciencedirect.com/science/article/pii/S0020025522006594>
- *Pinto, L., Gopalan, S., & Balasubramaniam, P. (2021). On the stability and generalization of neural networks with VC dimension and fuzzy feature encoders. Journal of the Franklin Institute, 358(16), 8786-8810. (SCI indexed with Impact factor- 4.246)*
<https://www.sciencedirect.com/science/article/abs/pii/S001600322100507X>
- *Pinto, L., Gopalan, S., & Sundararajan, S. (2018, September). VC Dimension Based Fuzzy Sigmoid Neural Network (VC-FSNN). In 2018 International Conference on Intelligent Systems (IS) (pp. 318-323). IEEE. (Scopus Indexed Conference Proceedings)*
<https://ieeexplore.ieee.org/abstract/document/8710465>
- *Sasi Gopalan, Linu Pinto, Sheela. C.3, Arun Kumar M. N, Function Approximation with Deep Neural Network for Image Classification in Fuzzy Domain, Appl. Math. Inf. Sci. 11, No. 6, 1725-1730 (2017) (Scopus Indexed- Impact Factor 1.17)*
<https://www.naturalspublishing.com/files/published/4153m6l5j6vb8h.pdf>

PREPRINT PUBLICATIONS

- *KN, S., Pinto, L., Gopalan, S & Balasubramaniam, P. Equivalence Class and Modified Gaussian Methods for Normalization of Time Series Data on AI Models (Under review on Elsevier Journal Expert System with Applications (Impact Factor 8.5) and preprint available on SSRN and submitted as per first revision)*
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4261639
- *Pinto, L., & Gopalan, D. (2019). Limiting network size within finite bounds for optimization. <https://arxiv.org/abs/1903.02809>*