TWO DAYS WORKSHOP ON

MACHINE LEARNING DEEP LEARNING COMPUTATIONAL INTELLIGENCE FOR WIRELESS COMMUNICATION 2027

Feb 19th 2027 to

Feb 20th 2027

MDCWC 2027

(HYBRID EVENT)

Topics covered based on the following books





Objective:

Due to the feasibility of collecting huge data from mobile and wireless networks, there are many possibilities of using Machine learning, Deep-learning and the Computational Intelligence to interpret and to hunt knowledge from the collected data. The course aims on strengthening the mathematical foundations involved in wireless communication, machine learning, deep learning and computational intelligence using illustrations using Matlab.

Tentative schedule

DAY 1 Parametric approach to Linear regression (Maximum Likelihood Estimation, Least square estimation) – Invited talk -1 Regularization technique Bayes technique, Kernel smoothing Gaussian process technique. GMM and HMM. Case study*

DAY-2 Principal Component Analysis, Linear Discriminant Analysis, Kernel Linear Discriminant Analysis, Independent Component Analysis, Invited talk-2 Bayes, Mini-Max and Neyman-pearson technique Multiple class Logistic regression, Support Vector Machine and Artificial Neural Network Estimation theory: MMSE, MMAE and MAP Estimation. Case study*

*** Invited speakers are from IITs / NITs/ Relevant Industry partner Link for further details:**

Topics of case study*

S. M. Baby and E. S. Gopi, "Complex Valued Linear Discriminant Analysis on mmWave Radar Face Signatures for Task-Oriented Semantic Communication," in IEEE Transactions on Cognitive Communications and Networking, vol. 12, pp. 1892-1904, 2026
S. M. Baby and E. S. Gopi, "Complex Chromatic Imaging For Enhanced Radar Face Recognition," Elsevier journal on Computers & Electrical Engineering, vol. 25, 2025.
C. Kiruthika and E. S. Gopi, Signal and Channel State Information compression, detection for various channel model "FBCNet: Fusion Basis Complex-valued Neural Network for CSI compression in Massive MIMO networks," IEEE Networking Letters, 2024.

Kiruthika and E. S. Gopi, "CSI compression with Kernel-based sparsity learning for FDD Massive MIMO systems," IEEE Transactions on Cognitive Communications and Networking, 2024.
Kiruthika C., E.S. Gopi, Distribution aware kernel density function-based quantizer using trapezoidal approximation for massive MIMO CSI feedback, AEU - International Journal of Electronics and Communications, Volume 212, 2026,156337,ISSN 1434-8411
S. M. Baby and E. S. Gopi, "Kernel Linear Discriminant Analysis Based Precoding for Multitask Semantic Communication," *2026 National Conference on Communications (NCC)*, Hyderabad, India, 2026, pp. 96-101
S. M. Baby and E. S. Gopi, "Gaussian process based Semantic communication for translational pose prediction in vehicles," *2025 IEEE 9th International Conference on Information and Communication Technology (CICT)*, Chennai, India, 2025, pp. 1-6



Co-ordinator and Speaker: Dr. E. S. Gopi is a professor in the Department of Electronics and Communication Engineering at the National Institute of Technology, Tiruchirappalli (Government of India), with 25 years of experience in teaching and research. He has authored eight books and edited three publications with Springer, primarily focusing on signal processing and pattern recognition. His book Pattern Recognition and Computational Intelligence using MATLAB was recognized by Book Authority as a notable resource in the field. In addition, he serves as the series editor for Springer's Signals and Communication Technology series. He has contributed to several research publications, including journal articles, book chapters, and conference proceedings. His publications include articles in IEEE Transactions on Cognitive Communications and Networking, IEEE Networking Letters, IEEE Geoscience and Remote Sensing Letters, IEEE Transactions on Emerging Topics in Computational Intelligence, Neurocomputing, Applied Mathematics and Computation, Expert Systems with Applications, Machine Learning with Applications, Ecological Informatics, Computers & Electrical Engineering and Swarm and Evolutionary Computation. He has been invited to speak at platforms like the Global Initiative of Academic Networks (GIAN) and the IEEE Training School on Machine Learning for Wireless Communication. He was recognized as a ScholarGPS 2025 Highly Ranked Scholar - Lifetime in the specialty of Digital Signal. This distinction recognizes exceptional productivity, noteworthy impact, and the quality of scholarly work, placing his contributions within the top 0.05% Fof scholars in this field worldwide. His research interests include machine intelligence, pattern recognition, statistical signal processing, and computational intelligence.

Registration Fee:

UG/PG/Ph.D. Scholars	**Rs. 3000***	**Maximum number of participants=30**
Faculty	**Rs.4500***	**Maximum number of participants=30**
First Come First served basis. **Expression of interest: https://forms.gle/Rh8yT8H8nmK59vPJA** **The registration link will be sent to selected participants via email.** **Link for further details:**		

Organizing Team

Patron: Dr.G. Aghila, Director
Co-Patron: **Dr. M. Premalatha, Dean (Research and Consultancy),** **Dr. R. Pandeeswari, Head of the Department, ECE**
Co-ordinator and Speaker: Dr. E.S. Gopi, Professor, Department of ECE

- Visit of 5G Use case lab at NITT
- Demonstration on the usage of ML on GNU Radio using SDR setup