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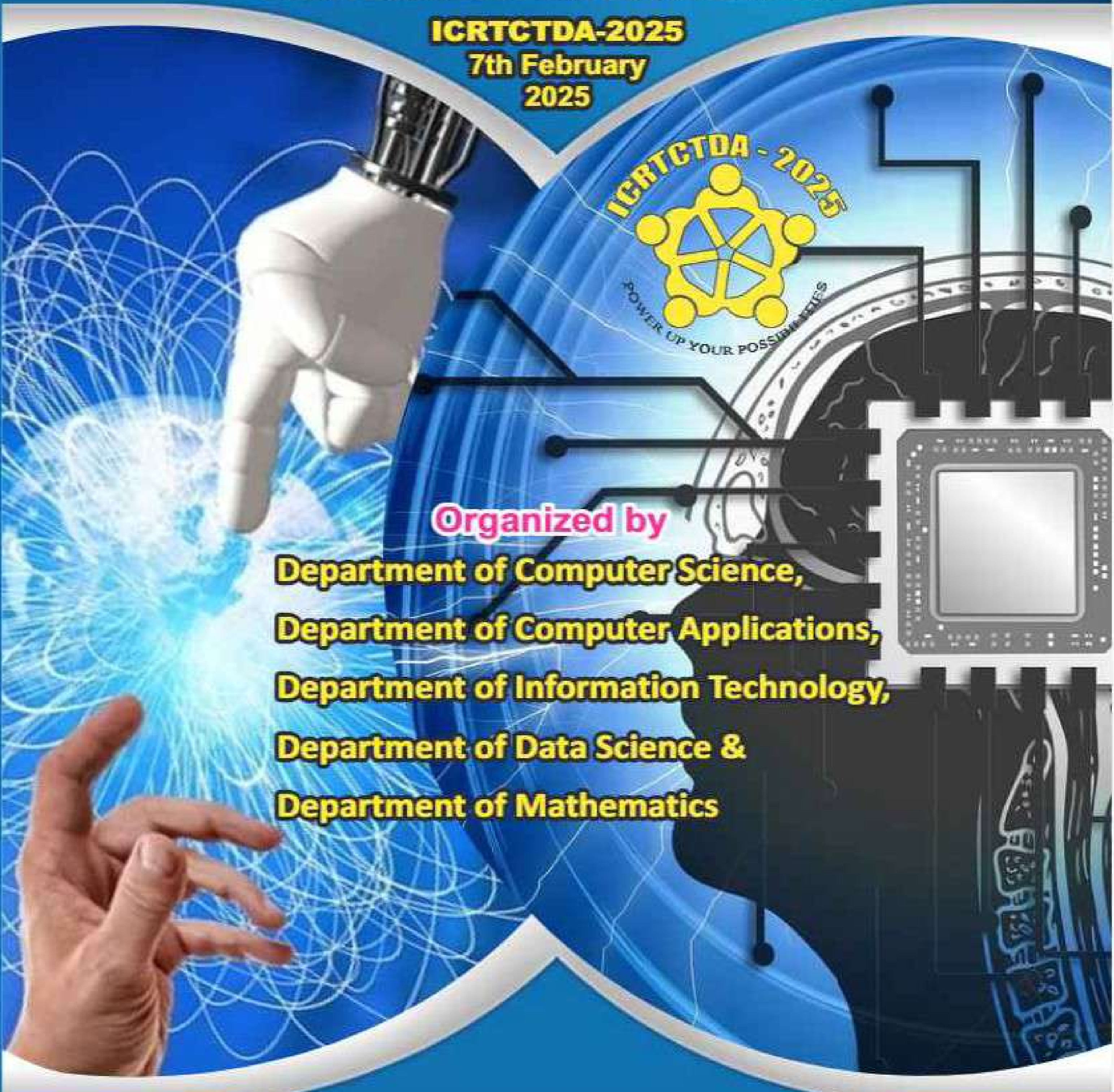
RECENT TRENDS IN COMPUTER SCIENCE, TECHNOLOGY, DATA SCIENCE AND APPLICATIONS

ICRTCTDA-2025
7th February 2025



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Abstract

Lung cancer remains one of the leading causes of cancer-related deaths globally. Early and accurate prediction is crucial for effective treatment and improved survival rates. This study evaluates the performance of ten machine learning classification algorithms on a publicly available lung cancer dataset. Logistic Regression demonstrated the best performance with the highest accuracy and balanced metrics including precision, recall, and F1-score. This work provides valuable insights into the application of machine learning techniques for medical diagnosis and highlights the potential for algorithm-driven prediction tools.The dataset, featuring demographic, lifestyle, and medical information, was preprocessed and analyzed using algorithms such as Logistic Regression, K-Nearest Neighbors, Decision Tree. Support Vector Machines, Naive Bayes, Random Forest, Gradient Boosting, Neural Networks, AdaBoost, and XGBoost. A standardized pipeline was implemented, including data splitting, feature scaling, and hyperparameter optimization using grid search with cross-validation. Model evaluation metrics—accuracy, precision, recall, F1-score, and confusion matrix—were employed to compare the algorithms. Logistic Regression achieved the highest accuracy (90.29%) alongside robust precision (0.9053), recall (0.9885), and F1-score (0.9451), making it the most effective model for this dataset. The study highlights the potential of machine learning in enhancing lung cancer diagnostics and offers insights for future research and clinical applications. A standardized pipeline was implemented, including data splitting, feature scaling, and hyperparameter optimization using grid search with cross-validation. Model evaluation metrics—accuracy, precision, recall, F1-score, and confusion matrix—were employed to compare the algorithms. Logistic Regression achieved the highest accuracy (90.29%) alongside robust precision (0.9053), recall (0.9885), and F1-score (0.9451), making it the most effective model for this dataset. The study highlights the potential of machine learning in enhancing lung cancer diagnostics and offers insights for future research and clinical applications.

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A STUDY OF DEEP LEARNING TECHNIQUES FOR DEEP BELIEF NETWORKS IN DEEP NEURAL NETS

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Abstract

In machine learning, deep learning is a rapidly growing field. It is composed of several nonlinear layers that learn different levels of data representations. Deep learning implements different computer models by using multiple layers to represent data abstractions. Information processing has changed as a result of deep learning techniques like model transfer and generative, discriminative models. This article proposes a thorough analysis of deep learning technique such as Deep belief networks. First, it provides a brief overview of current and historical the most advanced reviews along with appropriate architectures and implementation techniques. Deep Belief Network (DBN) is one of the deep learning architectures also a prominent machine learning technique, furthermore the various applications of those algorithms in various domains like speech recognition engineering, medical applications, natural language processing, material science, wireless networks, adhoc networks, mobile ad hoc and vehicular ad hoc networks, etc. are categorized. In deep layered networks, Deep Belief Networks (DBNs) are used to solve problems using traditional neural networks. Slow learning, getting trapped in local minima due to inadequate parameter selection, and needing a lot of training datasets for the specified input layer are a few examples. In more complex architectures, use deep belief networks instead of deep feedforward networks or even convolutional neural networks. They have the advantage of requiring less computing power. Unlike feedforward neural networks, where computational complexity increases exponentially with the number of layers, it grows linearly with the number of layers and is less vulnerable to the vanishing gradients issue.

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Uncovering Ambiguous Sentiment Contexts: An Innovative Method for Enhancing Sentiment Analysis Using Gaussian Distribution-Based Long Short-Term Memory (GD-LSTM)

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