Journal of Computer Science and Information Systems,

ISSN 2535-1451

Cancer Diagnosis Optimization in Medical Imaging Through Machine Learning Feature Selection Algorithms

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Abstract:

The integration of machine learning (ML) and neural network techniques has significantly enhanced cancer diagnosis by optimizing feature selection in medical imaging. Advanced models like D-Cube utilize diffusion models combined with contrastive learning to extract robust hyper-features, improving classification performance even in scenarios with data imbalance and limited samples . Similarly, the application of random projection algorithms in conjunction with support vector machines (SVMs) has demonstrated improved accuracy in breast lesion classification by reducing feature dimensionality and enhancing model robustness . These methodologies underscore the critical role of effective feature selection in developing reliable and efficient diagnostic tools, facilitating early detection and personalized treatment planning in oncology.

Keywords: Machine Learning, Feature Selection, Medical Imaging, Cancer Diagnosis, Neural Networks, Dimensionality Reduction

ISSN 2535-1451

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