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Prediction of Infiltrating Ductal Carcinoma using Morlet Wavelet Integrated Kolmogorov Arnold Network
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Abstract
Around the world, breast cancer is among the most terminal type of illness. Infiltrating ductal carcinoma, a case of breast cancer, accounts for 80% of the total diagnosed. The global impact of breast cancer signifies the need for the development of prompt and efficient diagnostic strategies. Morlet wavelet transform is a continuous wavelet transform that captures both spatial and frequency domains. The majority of its applications are in the field of signal processing and image analysis. Image processing helps extract features and examine patterns. This study introduces the model integrating Morlet wavelet transformation within the Kolmogorov Arnold Network (KAN).IDC_regular_ps50_idx5 dataset containing histopathological images is balanced using an augmentation technique. Training of the proposed model is done on the balanced dataset. This integration of Morlet wavelet transform within the Kolmogorov Arnold Network demonstrated impressive performance metrics values. The model achieved a specificity of 91.07%, precision of 90.83%, recall of 88.87%, F1 score of 89.83%, and overall accuracy of 89.97%. The model's output highlights the model's capability in breast cancer prediction.

Author Keywords
Breast Cancer Prediction; Histopathological Images; Kolmogorov-Arnold Network (KAN); Machine Learning; Morlet Wavelet Transformations

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