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AI-driven discrimination of benign from malignant pigmented skin lesions based on multispectral autofluorescence lifetime dermoscopy imaging

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Hide Abstract –

Melanoma is the most aggressive type of skin cancer with an estimated 106,110 new cases in 2021. Visual inspection and biopsy of lesions presents major drawbacks like incomplete border detection and, inability to distinguish similar lesions. In this work, a deep learning model using Long Short-Term Memory (LSTM) networks is trained on the multispectral autofluorescence lifetime dermoscopy images from benign and malignant skin lesions. The model generates posterior probability maps, and constructs Receiver Operator Characteristics (ROC) on the threshold of the median probabilities. Areas Under the Curve (AUC) for the ROCs on 10 test sets is 0.88 ± 0.08 .