LEVERAGING BREAST CANCER PREDICTION USING DEEP LEARNING

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ABSTRACT

Emphasizing temporal modeling techniques including 3D Convolutional Networks (C3D) and Recurrent Neural Networks (RNNs). This work assesses the efficacy of deep learning models for video tampering detection. Unlike other studies mostly depending on spatial characteristics, this work presents a hybrid CNN-RNN strategy combining temporal and spatial information to improve detection accuracy. Recognition accuracy is evaluated by a comparison between pretrained CNN models and temporal structures. Frame extraction, scaling, normalizing, and data augmentation form a systematic experimental setup meant to increase model generality. Adaptive optimization techniques (SGD with regularization) help the models to be tuned in order to reduce overfitting. Multiple metrics—including mean average precision (mAP), accuracy, precision, recall, and F1-score as well as cross-valuation define performance. Experimental results show that the proposed model beats traditional CNN based models with an F1-score of 84.5%, accuracy of 87.3%, precision of 85% and recall of 84% using a dataset of 60 video clips (30 original, 30 tampered). The high AUC value of the model confirms even more its capacity to differentiate tampered from real frames. These results highlight the need of including temporal dynamics for better manipulation detection. This study sets a standard for next projects in AI-driven video forensics by offering a reproducible, well documented experimental setup that helps to progress strong video tampering detection methods.

Keywords: Deep Learning, Convolutional Neural Networks, Temporal Modeling, Recurrent Neural Networks, Data Augmentation, Cross Validation, Performance Evaluation