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| Title | Leveraging deep neural networks to uncover unprecedented levels of precision in the diagnosis of hair and scalp disorders | | |
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| Abstract |  |
| Cauliflower cultivation plays a pivotal role in the Indian Subcontinent’s winter cropping landscape, contributing significantly to both agricultural output, economy and public health. However, the Background: Hair and scalp disorders present a significant challenge in dermatology due to their clinical diversity and overlapping symptoms, often leading to misdiagnoses. Traditional diagnostic methods rely heavily on clinical expertise and are limited by subjectivity and accessibility, necessitating more advanced and accessible diagnostic tools. Artificial intelligence (AI) and deep learning offer a promising solution for more accurate and efficient diagnosis. Methods: The research employs a modified Xception model incorporating ReLU activation, dense layers, global average pooling, regularization and dropout layers. This deep learning approach is evaluated against existing models like VGG19, Inception, ResNet, and DenseNet for its efficacy in accurately diagnosing various hair and scalp disorders. Results: The model achieved a 92% accuracy rate, significantly outperforming the comparative models, with accuracies ranging from 50% to 80%. Explainable AI techniques like Gradient-weighted Class Activation Mapping (Grad-CAM) and Saliency Map provided deeper insights into the model’s decision-making process. Conclusion: This study emphasizes the potential of AI in dermatology, particularly in accurately diagnosing hair and scalp disorders. The superior accuracy and interpretability of the model represents a significant advancement in dermatological diagnostics, promising more reliable and accessible diagnostic methods. | |