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**Skin Lesion Classification using an Ensemble of Multi-Channel  
Attention-based Deep CNN and Vision transformers**

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## ABSTRACT

Dermatological disorders are one of the most prevalent and significant causes of impairments worldwide. Reliable automated skin lesion segmentation and feature classification approaches can boost the precision and effectiveness of computer-aided diagnostic (CAD) systems for classifying skin lesions. Skin disease diagnosis is challenging, and precise segmentation is essential for drawing out important details from images of lesions. Learning long-range geometric connections in skin lesions is still difficult, despite the positive outcomes achieved by existing deep learning algorithms, such as CNN networks, in medical imaging processing applications. Enhancing segmentation and feature extraction can increase diagnostic precision, raise the standard of skin lesion datasets, and lessen the time-consuming manual tasks that dermatologists must conduct.

Using end to end ensemble deep learning approaches, a web application for classifying skin lesions is presented. By combining edge-based and region-based segmentation approaches, segmentation will be improved. To improve feature extraction, CNN with attention mechanism model and Vision Transformer model will be used. Afterward, features will be selected and applied using the feature significance technique, and classification will be carried out using CNN and Transformer model ensembles.

**Keywords:** Medical domain, Image preprocessing, Image segmentation, skin lesion, classification, CNN, Vision transformers, Deep learning ensemble models.

**Subject Descriptors:**

- Computing methodologies→Deep learning algorithms→Ensemble models
- Information systems → Information systems applications → Deep learning