Patent Search

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Inventor

Name	Address	Country	Nati
Abdul Rahman Shaik	Associate Professor, Department Of ECE, Vishnu Institute Of Technology, Kovvada, Bhimavaram, Andhra Pradesh, 534202.	India	India
K. Kiran	Assistant Professor, Department Of ECE, Vishnu Institute Of Technology, Kovvada, Bhimavaram, Andhra Pradesh, 534202.	India	India

Applicant

Name	Address	Country	Nation
Vishnu Institute of Technology	Sri Vishnu Education Society, Kovvada Rd, Vishnupur, Kovvada, Andhra Pradesh 534202	India	India

Abstract:

The invention discloses a deep convolutional neural network (DCNN) with fine-tuned hyperparameters for accurate classification of skin cancer using dermoscopic images system includes a preprocessing module for image normalization and augmentation, followed by a multi-layer DCNN architecture designed to extract hierarchical lesion fe Hyperparameters such as learning rate, kernel size, dropout ratio, batch size, and epochs are optimized to improve convergence, reduce overfitting, and enhance diagnost accuracy. A softmax-based classifier identifies malignant and benign lesions with high reliability. The invention overcomes limitations of conventional CNN and transfer-lea models by offering improved robustness across diverse datasets and enabling scalable deployment in clinical, telemedicine, and mobile diagnostic environments.

Complete Specification

Description:FIELD OF THE INVENTION

[001] The present invention relates to the fields of artificial intelligence, biomedical engineering, medical image analysis, and computer-aided diagnostic systems. More specifically, the invention pertains to the development of a Deep Convolutional Neural Network (DCNN) with fine-tuned hyperparameters for the automated detection ar classification of skin cancer using dermoscopic images. The invention further relates to advanced machine-learning architectures designed to enhance diagnostic accura optimize lesion-feature extraction, and provide reliable early-stage cancer identification in clinical, telemedicine, and remote healthcare environments.

BACKGROUND OF THE INVENTION

[002] Skin cancer has emerged as one of the most rapidly increasing malignant conditions worldwide, with annual incidence rates rising across all demographics. Early ar accurate detection of melanoma and other malignant skin lesions remains the single most critical factor influencing clinical outcomes, as timely diagnosis significantly improves treatment response and reduces mortality. Conventional diagnostic workflows rely almost exclusively on expert dermatologists visually analyzing dermoscopic images using clinical experience and manual pattern recognition. However, such assessments are inherently subjective and subject to inter-observer inconsistencies, leading to diagnostic variations across practitioners and healthcare settings. Moreover, in resource-constrained regions, the shortage of trained dermatologists exacerba delays in proper evaluation, emphasizing the pressing need for automated, reliable, and scalable diagnostic tools

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