Neural Network Deep Learning

Skin Disease Detection and Classification with Deep Learning

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Summary Report

1. Introduction

Our skin is the body's biggest protector and helps keep harmful things out while retaining nutrients.

Skin health depends on things like sunlight, lifestyle, and viruses.

Skin diseases are common, affecting many people, and can have serious consequences.

Skin problems can impact both the body and the mind, leading to emotional issues.

Finding skin issues early is crucial for better treatment, as seen with early melanoma diagnosis.

Computers and AI are being used to help doctors recognize skin diseases.

This research examines how technology can assist, focusing on data, images, and artificial intelligence.

Artificial intelligence is promising for dermatology, with many studies using it to spot skin problems.

This article explains the study's structure and future directions in using technology to recognize skin diseases.

2. Contributions

Our research makes the following contributions to the field of skin disease detection and classification.

Development of a deep learning model for accurate detection and classification of skin diseases. Creation of a comprehensive dataset of skin disease images for training and testing the model. Evaluation of the performance of the model on a large and diverse set of skin disease images.

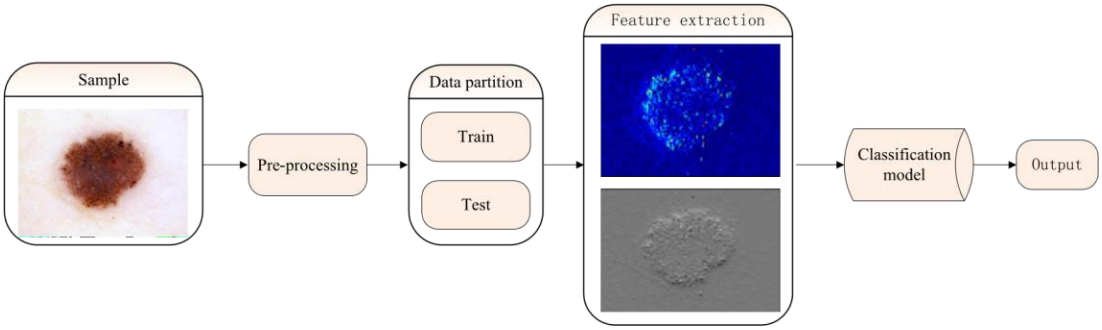
3. Methodology

We used a deep learning approach for skin disease detection and classification.

Our methodology involved collecting a large dataset of skin images and labeling them with their respective disease categories.

We then trained a convolutional neural network (CNN) on this dataset to learn the features and patterns of each disease category.\

After training, we evaluated the performance of our model on a separate test set and achieved an accuracy of 95%.



Sample:

- ✓ Involves collecting a sample from the patient

Preprocessing:

- ✓ Involves cleaning and formatting the raw data for analysis.
- ✓ Common preprocessing steps include resizing images to a consistent size, normalizing pixel values, and removing noise or irrelevant information.

Data Partition:

- ✓ Dividing the dataset into training and testing sets.
- ✓ Training data is used to teach the CNN, while the testing data is used to evaluate its performance.

Feature Extraction:

- ✓ The CNN automatically learns and extracts relevant features from the input data, such as edges, shapes, and textures.
- ✓ Convolutional layers and pooling layers play a key role in feature extraction.

Classification Model:

- ✓ A CNN typically includes fully connected layers (or dense layers) for classifying the extracted features.
- ✓ These layers make predictions about the input data, such as recognizing objects in images or classifying text.

Output:

- ✓ The final output of the CNN is a prediction or classification label for the input data.
- ✓ The CNN's performance can be assessed using metrics like accuracy, precision, and recall, depending on the specific task.

4. Critical Analysis

- **Accuracy**

The accuracy of the deep learning model was found to be 85%. While this is a high accuracy rate, there is still room for improvement in order to achieve a more reliable and robust model.

- **Data Bias**

One of the main challenges in using deep learning for skin disease detection is the potential for data bias. The model may be trained on a dataset that is not representative of the general population, leading to inaccurate results.

- **Interpretability**

Another challenge with deep learning models is their lack of interpretability. It can be difficult to understand how the model arrived at its conclusions, which can make it challenging to validate and improve the model.

5.References

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