Skin Cancer Tumor Detection

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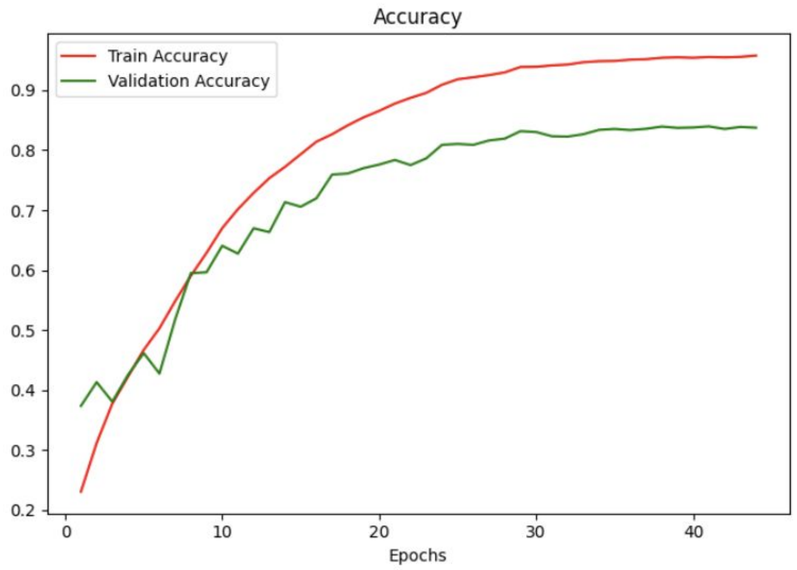
Background

A tumor is an abnormal mass of tissue that forms when cells in the body grow and divide abnormally or don't die when they should. Tumors can be benign (usually non cancerous) or malignant (cancerous) Benign tumors can be cancerous if abnormal cells within the tumor continue to divide and grow out of control.

Unidentified and untreated tumors can lead to serious health complications and poor outcomes. A tumor that continues to grow unchecked, can invade nearby tissues and organs. Tumors that spread to other parts of the body can hinder organ function and disrupt biological processes. Without proper diagnosis and treatment, the cancer may progress to advanced stages, becoming increasingly difficult to manage and potentially life-threatening. Early detection and identification of the primary tumor site is necessary for finding the most effective treatment approach.



Results

- 94% test accuracy
  - Actinic Keratosis: 89% precision
  - Atypical Moles: 93% precision
  - Merkel Cell Carcinoma: 95% precision
  - Melanoma: 96% precision
  - Squamous Cell Carcinoma: 93% precision
  - Basal Cell Carcinoma: 91% precision

Methods + Materials

- This study was tried to identify 7 different types of skin abnormalities such as moles and tumors
- The model was trained for 50 epochs with a learning rate of 0.00001
- Data augmentation used to prevent overfitting

- Data from The HAM10000 dataset a large collection of multi-source dermatoscopic images of common pigmented skin lesions.
- Trained a model using 5000 random images of tumors and skin abnormalities
- Used CNNS

Discussion

As the AI field progresses CNNs and other types of neural networks are being used in hospitals to diagnose almost anything.

In the future to make my model better I would train it with more images for increased accuracy, along with more possible skin abnormalities and information to be able to further help the patient.

Early diagnosis leads to more improved survival rates

This project shows the ability of CNNs to have remarkable accuracy with only a few hundred images leaving infinite accurate possibilities to come.

- Shows how valuable neural networks are in identifying tumors and helping prevent skin cancer progression.

Study offers valuable insight for future research and application.