DS Lab Term Project Proposal

Skin Blemish Image Classification

Group Members

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General Plan

We will try to identify skin blemishes and classify them into known classifications such as pimples, moles, acne, sunburn, psoriasis, birthmark, blister, hives, scabs, cuts, scars, etc. We want to be able to correctly identify clear skin, but also be able to correctly classify the type of blemish that appears on someone's skin. If we can correctly classify blemishes, this project could later be utilized to help people identify and correct issues with their skin.

How We Will Find Data

We have found several datasets composed of images of different types of skin conditions [1 - 5]. For the skin conditions that lack data, we plan to scrape those from Google Images. We will also explore if there are Kaggle competitions with relevant data.

What We Plan to Try

Considering that we are dealing with an image classification problem, we will most likely try to train neural networks to predict the class of skin condition. We will start by looking at current

state-of-art convolutional neural networks such as ResNet [6]. After analyzing successful models we will try to implement our own using either Keras/PyTorch.

What We Expect To Find

We hope to build a model that can classify images of skin accurately. We are planning on using convolutional neural networks, so it will be hard for us to have explainability in our results, and if our model is not very accurate then debugging will be a challenge. These models also take a long amount of time to train, so we will have to manage our time well and make sure our dataset is as robust and representative as possible so we do not waste time training bad models.

Going with CNNs might be our best best, but we need to watch out for a few things. Translational invariance can be exemplified by a picture with an already classified object in it with a slightly changed position not activating the neuron that is supposed to recognize it. Pooling layers is a problem where parts-to-a-whole are considered without relational information. For example, a face with eyes and mouth floating off a head could still be classified as a face. It would be smart of us to test for problems like these when applicable to skin blemishes and see what ways we could mitigate them [7].

References

1. https://www.kaggle.com/kmader/skin-cancer-mnist-ham10000
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