Identifying Poisonous Leaves Using Convolutional Neural Networks

This project aims to solve identifying the leaves of poisonous plants using images of poison ivy, poison oak, and poison sumac. The idea came from the idea that I found out I was deathly allergic to poison ivy during a walk in the woods.

Many people who are allergic to poisonous plants can benefit from an image classification model for poisonous plants. Regardless of the severity of allergic reactions, being able to avoid these plants without prior knowledge as to how to identify them from sight can save a lot of trouble, and in my case a trip to the hospital. There can also be the potential for business clients as well. Different outdoor companies who sell hiking or outdoor sports products could use the image classification in the form of a mobile app to help promote their company and products. Perhaps, the poisonous plant classification can be a feature in an outdoor hiking app which provides users with other various information on the outdoors like fishing spots, edible plants, mushrooms to avoid etc. It could possibly use in a suite of mobile apps for image classification on poisonous mushrooms, poisonous plants, edible plants, and so on.

For the data I have initially been scraping 100s of pictures of poison ivy, oak, and sumac from google images. I have been checking the images removing bad images and making sure the plants are the correct plants. Other sources of data I have been looking into are image databases.

I will attempt to solve this problem by first compiling a list of images and labeling them as the correct poisonous plants. Then, I will analyze the images and format them into workable resolutions and pixel sizes to be used in a neural network. Next, I plan to

use Keras/Tensorflow to develop and train a convolutional neural network. The whole process will follow a typical machine learning flow of splitting the data into training and test sets, tuning model parameters, and in this case the adding or removing of different types of layers and nodes in the neural network.

The deliverables for this project will be various Jupyter Notebooks, written reports, and slide presentation. The possibility to create a web application may present itself given the time constraints of the project.