



Deep Learning Brain Tumor Classification

Group 1: Medical Image Classifiers
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Brief Problem Description

- We are leveraging 3 different articles that each used a different pre-trained model (VGG16, ResNet50, InceptionV3) to classify Brain Tumor Images.
- Correct classification of brain tumor images is important because it can lead to a correct or incorrect diagnosis and treatment plan. An untreated tumor can continue to grow and cause irreversible damage.
- We are also aiming to create a general medical image classification model that can be used to diagnose other medical conditions, such as leukemia.

Accomplished Milestones

- Created overall framework and reusable functions for the following:
 - Displaying a sample set of images (with or without predictions)
 - Training a model, which includes compiling, fitting, and plotting learning history
 - Evaluating a model, which includes evaluating on a test dataset and displaying images with predictions
- Created a common set of data augmentation layers to be used with all models and datasets
- Created initial versions of VGG16, ResNet-50, and InceptionV3 models
- Ran VGG16 model on both brain tumor and leukemia data sets

Difficulties or Problems

- Competing priorities with other assignments, classes, job hunting, family responsibilities, and full-time jobs has made it difficult to find time to work on this project.

Modified Plan/Timeline

By end of March:

- Add confusion matrix and classification report to the `evaluate_model` function
- Create custom CNN based on one of the articles

By Mid-April:

- Continue to experiment with additional data augmentation options
- Continue to tune the Pretrained VGG16, ResNet-50, and InceptionV3 models

By end of April

- Look for additional medical image datasets to train the models on
- Finalize slides for in-class presentation
- Prepare final report

How have we addressed instructor feedback?

- We are looking to improve upon what has already been published by using the same models on different datasets.
- We will also be comparing different pre-trained models and identifying the pros/cons of each model based on the datasets we are using.

What is unique in our project?

- Our project is unique because we are looking to construct a model that can be used on different image classification datasets.
 - Built VGG-16 model using the brain tumor dataset, and currently getting ~66% accuracy
 - Ran the same VGG-16 model on the leukemia dataset and got ~75% accuracy
 - Still planning to do additional tuning on the VGG-16 model with the brain tumor dataset

References

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