

Homework 3 Report

Math 5185 - Artificial Intelligence for Clinical Data Analytics
Deadline 2019/06/06 20:00:00

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1. (1 %) Please describe your pre-processing process (normalizing, masking, cropping, resampling, etc.).

For HW3, before extracting features using VGG16 pre-trained model, I resize the images into (224, 224) and then turn them into RGB from gray-scale.

2. (3 %) Please extract and select radiomics features and discuss the performance. Specify the features you use and selection method.

I only try extract radiomics features on flair. At first, the default setting of segmentation label is 1, by these features, the model performance was terrible. Then, I tried set the label to 2, which improves; but, still needs some effort to perform well.

3. (5 %) Please compare your public and private score performance between the following methods:
 - a. Linear regression by age
 - b. NN by age
 - c. NN by image modality
 - d. NN by radiomics features
 - e. NN by image modality and concatenate with radiomics features

a. Linear regression by age: (private, public): (40530.95, 94633.81)
Model: linear SVR

b. NN by age: (private, public): (39520.16, 86993.99)
Model: a simple MLP with 2 hidden layer shown as below.

Layer (type)	Output Shape	Param #
dense_38 (Dense)	(None, 9)	18
dense_39 (Dense)	(None, 12)	120
dense_40 (Dense)	(None, 1)	13
Total params: 151		
Trainable params: 151		
Non-trainable params: 0		

c. NN by image modality: (private, public): (33651.91, 28428.37)
Model: Extract flair's features by VGG pre-trained model, flatten all and concatenates with age, then go through a hidden layer of 16 units and finally output layer of 1 unit.

- d. NN by radiomics features: (private, public): (142245.89, 52943.12)
Model: label 2 and GLCM only.
- e. NN by image modality and concatenate with radiomics features:
Didn't try yet, because NN by radiomics features don't work well yet.