Project A:Visual Interpretation of Convolutional Neural Networks

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Abstract—

I. Task 1: 1-Dimensional digit classification

A. Question 1

```
    weight_decay = 5e-4
    model = Sequential()
    #Your code starts from here
    model.add(Input(shape=(40,1)))
    model.add(Conv1D(25, kernel_size=5,
        padding='same', activation='relu',
         kernel_regularizer=regularizers.
        l2(weight_decay)))
    model.add(Conv1D(25, kernel_size=3,
        padding='same', activation='relu',
         kernel_regularizer=regularizers.
        l2(weight_decay)))
    model.add(Conv1D(25, kernel_size=3,
        padding='same', activation='relu',
         kernel_regularizer=regularizers.
        l2(weight_decay)))

    model.add(Flatten())
    model.add(Dense(10, activation='
        softmax', kernel_initializer=keras
        .initializers.RandomNormal(mean
        =0.0, stddev=0.5),
                    bias_initializer=
                        keras.initializers
                        .Zeros(),
                        kernel_regularizer
                        =regularizers.l2(
                        weight_decay)))

    model.summary()
```

code
train
plot loss accuracy overall accuracy class-wise accuracy roc auc F-1

II. Task 2: CNN interprectation

CNN

III. Task 3: Biomedical image classification and interpretation

HMT
CAPTUM

IV. Task 4: Quantitative evaluation of the attribution methods

k 30 drop increase HMT 90 reason

References

[1] Y. Gilad, R. Hemo, S. Micali, G. Vlachos, and N. Zeldovich, "Algorand: Scaling Byzantine Agreements for Cryptocurrencies," in Proceedings of the 26th Symposium on operating systems principles, 2017, pp. 51–68. doi: 10.1145/3132747.3132757.

[2] King, Sunny, and Scott Nadal. "Ppcoin: Peer-to-peer crypto-currency with proof-of-stake." self-published paper, August 19.1, 2012.