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Project 2 Report

Model Descriptions

# Prog1-5, Prog1-10

The model has eight levels. The following is a description of the architecture:

1. The LeakyReLU activation function is used in the first layer's dense layer, which has 1024 neurons and accepts input shapes of size n.
2. The second layer is a batch normalization layer, which serves to increase the network's stability during training by normalizing the activations of the first layer.
3. A dropout layer with a rate of 0.5 makes up the third layer. In order to avoid overfitting, this layer randomly removes 50% of the connections between the previous and current layers.
4. The LeakyReLU activation function is used in the fourth layer, which is a dense layer with 512 neurons.
5. Another BatchNormalization layer is present in the fifth layer.
6. The LeakyReLU activation function and L2 regularization with a coefficient of 0.01 in the sixth layer, which is dense and contains 64 neurons, assist prevent overfitting.
7. A dropout layer with a rate of 0.2 makes up the seventh layer.
8. The softmax activation function is used in the final layer, which is a dense layer with 10 neurons. The final prediction probabilities for 10 classes are output by this layer.

# Prog2-5, Prog2-10

The model has fourteen levels. The following is a description of the architecture:

1. The LeakyReLU activation function is used in the first layer's dense layer, which has 1024 neurons and accepts input shapes of size n.
2. BatchNormalization layers, which are present in the second and fourth layers, normalize the activations of the preceding layers and enhance the network's stability during training.
3. The ELU activation function is used in the third layer, which is a dense layer with 512 neurons. Similar to the ReLU activation function, the ELU activation function has various advantages over the latter, including the ability to be differentiable at zero and the presence of negative values for negative input.
4. The LeakyReLU activation function is used in the fifth layer, which is a dense layer made up of 256 neurons. In order to aid avoid overfitting, it also has L2 regularization with a coefficient of 0.002.
5. A dropout layer with a rate of 0.5 makes up the sixth layer. In order to avoid overfitting, this layer randomly removes 50% of the connections between the previous and current layers.
6. The LeakyReLU activation function is used in the seventh layer, which is a dense layer with 128 neurons.
7. A Reshape layer, which is the eighth layer, gives the output of the layer before it a time dimension.
8. An LSTM layer with 128 neurons makes up the ninth layer. A recurrent neural network using this layer can be trained to recognize temporal dependencies in the input data.
9. Another BatchNormalization layer is present in the tenth layer.
10. The LeakyReLU activation function is used in the dense layer with five neurons in the eleventh layer, which also incorporates L2 regularization with a coefficient of 0.001.
11. A dropout layer with a rate of 0.2 makes up the twelfth layer.
12. The softmax activation function is used in the final layer, which is a dense layer of k neurons. The final prediction probabilities for the k classes are output by this layer.

Accuracies

# Prog1-5



# Prog2-5



# Prog1-10



# Prog2-10

