论文第四章中的主要提示工程

1. 生成训练CNN脚本的提示工程

You are an expert at coding. I have 540 pieces of data and I want to train convolutional neural network model using these data. Now, generate the MATLAB script for this process. The script should have the functions below:

1. Data preprocessing and dataset dividing. The script should load the data from a .csv file. Column 1 to Column 27 are the input features, and Column 28 to Column 34 are the output features. After loading the data, the script should normalize the dataset to the range of 0 to 1. Then the script should divide the training set and the testing set in a ratio of 8:2 randomly using a certain random seed.

2. Model training, testing and evaluation. After dividing the training set and testing set, the script should train the model. The script should contain a set of network architecture and parameters that you recommend. Then the script should test the model on the testing set, and evaluate the performance of the model using determination coefficient (R2), mean absolute error (MAE) and root mean square error (RMSE).

3. Data saving. The script should save three MATLAB data files. The first data file contains the training set and testing set. The second data file contains only one variable, which is the trained model. The third data file contains the actual and predicted output features both on the training set and the testing set, and the evaluation parameters of the model on the training set and the testing set.

Should you have any question or find any aspects of this prompt unclear, please include them in your response.

2. 生成训练LSTM脚本的提示工程

You are an expert at coding. I have 540 pieces of data and I want to train long short-term memory neural network model using these data. Now, generate the MATLAB script for this process. The script should have the functions below:

1. Data preprocessing and dataset dividing. The script should load the data from a .csv file. Column 1 to Column 27 are the input features, and Column 28 to Column 34 are the output features. After loading the data, the script should normalize the dataset to the range of 0 to 1. Then the script should divide the training set and the testing set in a ratio of 8:2 randomly using a certain random seed.

2. Model training, testing and evaluation. After dividing the training set and testing set, the script should train the model. The script should contain a set of network architecture and parameters that you recommend. Then the script should test the model on the testing set, and evaluate the performance of the model using determination coefficient (R2), mean absolute error (MAE) and root mean square error (RMSE).

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3. 生成训练LSTM脚本的提示工程

You are an expert at coding. I have 540 pieces of data and I want to train long short-term memory neural network model using these data. Now, generate the MATLAB script for this process. The script should have the functions below:

1. Data preprocessing and dataset dividing. The script should load the data from a .csv file. Column 1 to Column 27 are the input features, and Column 28 to Column 34 are the output features. After loading the data, the script should normalize the dataset to the range of 0 to 1. Then the script should divide the training set and the testing set in a ratio of 8:2 randomly using a certain random seed.

2. Model training, testing and evaluation. After dividing the training set and testing set, the script should train the model. The script should contain a set of network architecture and parameters that you recommend. Then the script should test the model on the testing set, and evaluate the performance of the model using determination coefficient (R2), mean absolute error (MAE) and root mean square error (RMSE).

3. Data saving. The script should save three MATLAB data files. The first data file contains the training set and testing set. The second data file contains only one variable, which is the trained model. The third data file contains the actual and predicted output features both on the training set and the testing set, and the evaluation parameters of the model on the training set and the testing set.

Should you have any question or find any aspects of this prompt unclear, please include them in your response.

4. 生成Grad-CAM解释脚本的提示工程

You are an expert at coding. Previously, I have trained a convolutional neural network (CNN) and now I want to interpret this model using gradient-weighted class activation mapping (Grad-CAM) method. Now, generate the MATLAB script for this process. The script should have the functions below:

1. Load data. The script should load the training set and the CNN model that are stored in MATLAB data file.

2. Execute Grad-CAM. The script should execute Grad-CAM explanation for all 7 output features. Every entry in the training set should be used as a query point.

3. Output data. The script should output the Grad-CAM results in a CSV file.

Should you have any question or find any aspects of this prompt unclear, please include them in your response.