Academic writing (02)

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Contents

Ref: Deep learning model based on urban multi-source data for predicting heavy metals (Cu, Zn, Ni, Cr) in industrial sewer networks

1. It is of great significance to timely control the abnormal heavy metal concentrations in industrial sewer networks and avoid its serious impacts on WWTPs.
2. The deep learning model shows better prediction performance and accuracy because of its stronger learning ability, higher fault tolerance, and superior generalization ability.
3. It is crucial to identify the key input variables for the deep learning model and eliminate the indicators that contribute less to the prediction performance. In this way, the prediction efficiency of the model can be improved, and the prediction cost can be reduced.
4. A correlation indicates that there is an overlap of the input information, which will affect the operation efficiency of the model.
5. To better construct the model, it was necessary to normalize the dataset to avoid the possible interference of the input variables due to amplitude differences.
6. In general, the model can capture the concentration variation trends of the four heavy metals.
7. It is worth nothing that the input variables used to construct the model in this study were easy to obtain.
8. Models constructed in this study can achieve a high accuracy prediction of peak values of heavy metal concentration. This will provide a reliable basis for the early warning of excessive heavy metal concentrations in industrial sewer networks, thereby avoiding the impact of heavy metals on WWTPs, which is significant for intelligent control of drainage water quality in industrial sewer networks.
9. Thus, in order to ensure the economic availability of the model, it is necessary to consider the economic cost of input indicators while reasonably selecting valuable input indicators.

10. For the variables that can be measured in real-time, the use of sensors with a high temporal resolution has a relatively high cost, especially for the maintenance of instrument probes.