



Optimal scheduling and decision-making method of reservoir water treatment based on reinforcement learning and big data

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ABSTRACT

Water is an inseparable resource for human life, and the stable operation of reservoirs plays an important role in ensuring the quality of life of citizens. Reservoir scheduling is a key step in the process of stabilizing water resources. At present, the construction scale of reservoirs is getting larger and larger, and it is difficult to consider the different conditions and comprehensive factors of power generation and meteorological directions in the traditional reservoir scheduling calculation scheme. The development of big data technology provides a reference for the establishment of data sets for reservoir dispatching methods, and the emergence of reinforcement learning can just be combined with the idea of optimal reservoir dispatching. The historical scheduling methods only make simple single-factor impact analysis based on various influencing factors, and do not carry out joint analysis based on various influencing factors. This paper first analyzes the basic concepts of big data and reinforcement learning, and then analyzes the problem of historical reservoir scheduling methods. Combining big data and reinforcement learning technology, the big data reservoir scheduling platform and the reinforcement Q-learning reservoir scheduling method are designed respectively. The self-learning model of the reservoir obtains the optimal solution in the current scheduling scheme through continuous learning and summarization, and finally realizes the most stable operating state of the reservoir.

Keywords: Water; Reservoir scheduling platform; Reinforcement learning; Big data
