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AN ANALYSIS OF AIR QUALITY WITH DENSITY PEAK CLUSTERING AND COULOMB FORCE THEORY

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Abstract

The variation of air quality has strong nonlinear characteristics, so it is difficult to obtain accurate analysis results. In order to overcome this defect, this paper introduces the Coulomb force theory into the density peak clustering (CDPC), and builds a new method for air quality analysis which is characterized by data similarity detection. We test the proposed algorithm in the experimental dataset and compare it with other most advanced algorithms. The simulation results show that the proposed algorithm has better clustering performance. We use Changchun air quality data as an example to verify the practicality of the method and to provide an effective tool for air quality analysis. We apply the artificial intelligence theory to the air pollution research field, and realize the interdisciplinary integration to provide a new method for the air quality analysis field. This method provides a new technology and solution for the construction and planning of smart city, and it has certain practical value to provide effective reference basis and intellectual support for the innovation and management of smart city.

Key words: air quality, clustering analysis, coulomb force theory, density peak clustering, smart city

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