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An optimized computational water quality prediction model

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Water is one of the most critical necessities for living beings. In the past, it was possible to consume water directly from water sources, but nowadays, it is impossible to do so as water quality has deteriorated at an alarming rate. Therefore, water quality testing and purification processes before consumption have become essential today. When these tests are performed in a laboratory, they can be expensive and time-consuming. Various researchers have researched in order to predict water quality using different machine learning algorithms and found that these tests are unique to each water source. Therefore, this research has used Support Vector Machine, Decision Tree and K-nearest Neighbor algorithms, for the model development. As this research objective is independent of the algorithm used no comparison of algorithms was conducted. However, the research objective of this study is to minimize the time consumption and the total expenditure for the water quality laboratory testing process. In order to achieve that, a model would be developed to predict the water quality effectively by selecting the most suitable subset of parameters from the available parameters, based on the historical data on measuring water quality. For this study, data from fifteen parameters related to physical and chemical requirements from various locations on the Nilwala River during the last ten years were obtained from a verified source. The wrapper-based feature selection technology was employed to identify the most suitable subset of parameters out of fifteen test parameters: pH., turbidity, Color, EC, Total hardness, TDS, and Total iron.

Keywords: Water quality prediction, Feature selection, Machine learning

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