Intelligent Data Mining Techniques
to Verification of Water Quality Index

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Abstract. Rivers are an important aspect of the water supply, so they play a vital role in increasing the life expectancy of living organisms. Water Quality Indicators (WQIs) can be used to determine the basic properties of water pollutants. Therefore, the high demand for accurate forecasting of water quality indicators is of great importance for understanding pollutant trends in natural currents. Field Studies performed on various rivers have shown that there is no general association between yielding water quality parameters with a permissible degree of accuracy. Over the past several decades, many models of artificial intelligence (AI) have been used to forecasting more accurate estimation of WQIs than traditional models. The current research used the multivariate adaptive regression spline (MARS) algorithm with Bat algorithm to predict five-day biochemical oxygen demand (BOD5) and chemical oxygen demand (COD) indices. To strengthen the solution suggested. Done determination of nine independent input parameters, namely electrical conductivity (EC), sodium (Na), calcium (Ca), magnesium (Mg), orthophosphate (PO), nitrite (NO2), nitrate nitrogen (NO3), turbidity, and pH.

Keywords: Intelligent data mining · Bat algorithm · MARS algorithm · Water quality index · Prediction · Optimization

1 Introduction

Water is considered one of the most important resource to continuous the life in the world, where, without water no life. The source of water split into two types: surface and groundwater water, in general, lakes, rivers and reservoirs forms the surface water. While, ground water lies under the surface. Water supply crisis is a globally scaled challenge. The latest global risks report of the world economic forum's indicates that water supply crisis is placed on the top five challenges that must be addressed over the next decade. By the year of the 2025, most of the African countries will reach the limits of their usable water resources. Global warming, climate change and overutilized water resources added an additional challenge to the limitation of the available water resources. Population raise resulted in a noticeable growth in urbanization and agricultural and industrial activities. All together, these factors reduce the water quality that manifested in form of