



An Expert Approach for Data Flow Prediction: Case Study of Wireless Sensor Networks

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Abstract

The data flow is an important parameter used in the optimization problem of Wireless Sensor Networks. This paper presents an expert approach for improved data flow prediction based on data discretization and artificial intelligence. The proposed approach has been implemented on various machine learning methods (a total of 17 methods). This data flow prediction is based on the dataset generated from the simulations with NS-2.35 for multiple Wireless Sensor Networks (5- to -50 nodes). The performance comparison of different machine learning models with continuous data and discretized data is also presented. The proposed approach considerably reduces the execution time of the machine learning models for training purposes and also enhances the accuracy of prediction. The result analysis shows that the proposed approach is better compared to various machine learning methods. Also, the proposed approach is able to handle both continuous and discrete data. The datasets used in this work are available as a supplement at [NDS and DDS link](#).

Keywords Artificial intelligence · Data discretization · Data flow · Wireless Sensor Networks

1 Introduction

The data discretization is a process of converting continuous values to discrete values [1]. For this conversion process, a bin with a minimum and a maximum value is required. A bin is defined as a range of values which can be discretized to a single value. The values lying in this bin are assigned to a fixed value depending upon the chosen candidate split-point. A

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