

Interactive comment on “Integrated versus isolated scenario for prediction dissolved oxygen at progression of water quality monitoring stations” by A. A. Najah et al.

Anonymous Referee #1

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The paper is about predicting dissolved oxygen (DO) at Johor River Basin by using Multi Layer Perceptron Neural Network Model (MLP-NN). For the purpose of the authors, two scenarios are proposed. In the first scenario (the isolated one), data about five input parameters including Temperature, Electrical Conductivity, pH, NO₃ and NH₃-NL and an output dissolved oxygen collected from four different water quality monitoring stations located at Johor River Basin are used for MLP-NN modelling purpose. In the second scenario (the integrated one), in addition to the five input parameters, predicted DO values at upstream stations are also used as a model input. The paper concludes that the predictions made based on the second scenario outper-

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form those made by the first one, in terms of coefficients of correlation between the observed and predicted values.

The paper is clear and well written but there are some major questions that should be answered by the authors:

SPECIFIC COMMENTS: 1. The paper reports the results of an MLP-NN modelling effort based on collected data. However, the true cause and effect relation between the selected input parameters and the output parameter still requires justification. The comments made on Page 6074 is not convincing in terms of both necessity and sufficiency of the selected input parameters.

2. In a ms of this type I might expect some discussion of the 'stochastic' nature of the models, and the problems of relating the outcomes to understanding of the real chemical processes involved.

3. Page 6071 Line 8: "Water quality is one of the main characteristics of a river, which purpose is not only for human water supply" It is not clear to me what do authors mean by this sentence ?

4. Page 6073 Line 3: ". . . water quality parameters in terms of dissolved oxygen (DO), having the dynamic processes hidden in the measured data itself." What do authors mean by phrase "having dynamic processes hidden in the measured data itself". How does a dynamic process can be hidden in the measured data? Please, explain it.

5. Page 6076 Equation 2: Activation value ξ is missing.

6. Page 6077 Equation 4: constant multiplier $1/2$ is missing.

7. Page 6077 Equations 5 and 6: The all + operators should be replaced by commas.

8. Page 6079: The back prop algorithm is well-known. So, it is not necessary to describe it in the paper. Just provide a 1-paragraph description with appropriate references.

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9. Page 6079: It better to rewrite the Equation 8 as: $\Delta = x^{(k+1)} - x^{(k)} = -[J^T J + \lambda I]^{-1} J^T E$ where Δ defines amount of weight update.

10. Page 24: The claim in the last sentence of the page "..... offering a relatively fast algorithm" requires justification by giving comparative execution time performance results.

11. Page 25: The conclusion section is rather like an introduction section and should be re-written.

12. Page 6101: Figure 2 can be found in any text, and so is not necessary.

13. Page 6095: Instead of Table 3, the scatter plots of the inputs vs DO will be more useful.

These objections must be addressed before any resubmission can be made.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 6069, 2011.

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