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Hydrology and Earth System Sciences Discussions

Interactive comment on "A hybrid least squares support vector machines and GMDH approach for river flow forecasting" *by* R. Samsudin et al.

Anonymous Referee #2

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I am quite critical about the paper. It could be that I am unable to appreciate nuances of the presented material, in which case the paper should be re-written to communicate the findings in better fashion. However, I am much more concerned that poposed technique is flawed.

The paper proposes a hybrid SVM and GMDH algorithm.

GMDH is polinomial fitting technique (which is pre-cursor of modern neural networks and is not its "sub model as erroneously stated on page 3694). GMDH fitting is based on empirical risk minimisation through minimising root mean square error or similar error matrix.

SVM is kernel-function based technique which works finds suitable data points (support vectors) and employs principle of structural risk minimisation to fit kernel functions to selected support vectors. The technique was develop by Vapnik earlier than 1991 (as erroneously stated on page 3693).

The proposed hybrid technique does not take advantage of the two techniques. Furthermore, the fashion in which the hybrid has been constructed seem to be based on over-fitting. Figure 4 seem to indicate that GMDH firstly carries out polynomial fitting. After the fitting has been carried out, SVM is applied on GMDH fitted outputs to fit one again (second time!) to produce an output. This is an open invitation to overfitting and I do not see anywhere in the text how is this issues addressed, if at all.

On a different note, the paper is entitled " A Hybrid Least Squares Support Vector Machines and GMDH Approach". However, large body of the paper covers ARIMA and ANN. The authors should at least consider changing the title to accurately reflect scope of the paper.

Language needs quite some improvements. Sentences such as "More advanced AI is support vector machine (SVM) is proposed.." just do not read well at all.

Unfortunately, I cannot recommend the paper in its present form and believe that much more work needs to be carried out before it is suitable for publication in scholarly journal.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 3691, 2010.