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Hydrology and Earth System Sciences Discussions

Interactive comment on "River Flow Forecasting: a Hybrid Model of Self Organizing Maps and Least Square Support Vector Machine" *by* S. Ismail et al.

Anonymous Referee #2

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The paper presents a hybrid approach that uses a combination of SOM and LSSVM. These types of data-driven model combinations are not new and have been widely explored in the last decades as modular and committee models. Other studies have shown that they are an important tool for forecasting flows which is concluded again in this paper. I believe this paper fits on the multiple-experiences generated using this type of models and it is an important reference paper on the combination of models. However, the paper suffers from a high number of grammatical errors as well as phrases that do not provide any clear information. This makes the paper no only difficult to read, but also it is not useful as reference. The paper presents a number of well know descriptions like ANN and LSSWM. I think the paper requires a major revision to make the case study presented clearer. Aside of this there are a couple of references

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missing on important experiences with modular and hybrid models. In general the paper should improve the following sections: Abstract need to be improved, first line is quite vague. The procedure of the comparison used is not mentioned as well as the forecast horizon. Conclusion of a promising alternative is not an achievement since many other papers have shown the same before. Page 8180 From line 17-24 the text seem to belong more to the Case study description (Move or adapt). This text doesn't have a reference to the figure that contains the location. Line 24 it would appear that is better to say others and not "Farmer and etc". Page 8181 Improve line "In the few a decades, " full sentence is not clear Page 8082 Line 28, reference to clustering using Kmeans and ANN are missing as well as expert knowledge in the data separation. Please see: Corzo, G.A. and Solomatine, D.P., 2007. Baseflow separation techniques for modular artificial neural networks modelling in flow forecasting Hydrol. Sci. J., 52(3): 491-507 Corzo, G. and Solomatine, D.P., 2007. Knowledge-based modularization and global optimization of artificial neural network models in hydrological forecasting. Neural Networks, 20: 528-536. Page 8183 Description of ANN is somehow vague. I would suggest removing and or modifying. The most important information required is to provide the type of structure, forecast setup, and other characteristics of the runs. I think the same applies for LSSVM Page 8186 The methodology should go to the point and not divagate with and introduction. Please modify the section 2.3. Please avoid providing many references of the methodology in the description of the methodology. If needed, better include some text of it in the Introduction. Page 8188 The text in line 23-24 doesn't mention anything about the validation or testing data sets used. If this was not used the results of the models and their inter-comparison are not reliable. Page 8189 On line 7 add number of samples in brackets. On line 23 the text belongs to input determination and not case study. It is not clear alone how you did the parameter optimization and the model selection. As well as how did you reach the 88% value? What was the similarity of the training and testing (correlation, visual inspection). It is important to have a hydrograph of the monthly means to visualize the complexity and seasonality of the time series. This text should be replaced for information about

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the basin like travel time of the river, statistics of the river flow and general information about the topography and land use of the region . Page 8191 On equation 17 please describe what is a and B. ARIMA was not mentioned as a model in the comparison process. And later on in your tables and text you use it. It is important to include it in the abstract and other relevant places. Page 8193 Application of ANN seems to be the same matter as in the ANN methodology, which is part in ANN description, part in the case study and so on. Either move the text to the right place or bring the text from the other section and organize a clear description of the procedure only once and clear.

Page 8195 Since the model using the SOM-LSSVM divides the samples it is important to compare the regions divided with all the models compared. This since the different clusters obtained might be losing precision in some models and improving in others. This is specially misleading when RMSE is used for comparison (Table 2). Low and high flows are highly misrepresented in some models.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 8179, 2010.