World Academy of Science, Engineering and Technology
International Journal of Bioengineering and Life Sciences
Vol:8, No:05, 2014

The Use of Stochastic Gradient Boosting Method for Multi-Model Combination of Rainfall-Runoff Models

Authors : Phanida Phukoetphim, Asaad Y. Shamseldin

Abstract : In this study, the novel Stochastic Gradient Boosting (SGB) combination method is addressed for producing daily river flows from four different rain-runoff models of Ohinemuri catchment, New Zealand. The selected rainfall-runoff models are two empirical black-box models: linear perturbation model and linear varying gain factor model, two conceptual models: soil moisture accounting and routing model and Nedbør-Afrstrømnings model. In this study, the simple average combination method and the weighted average combination method were used as a benchmark for comparing the results of the novel SGB combination method. The models and combination results are evaluated using statistical and graphical criteria. Overall results of this study show that the use of combination technique can certainly improve the simulated river flows of four selected models for Ohinemuri catchment, New Zealand. The results also indicate that the novel SGB combination method is capable of accurate prediction when used in a combination method of the simulated river flows in New Zealand.

Keywords : multi-model combination, rainfall-runoff modeling, stochastic gradient boosting, bioinformatics
Conference Title : ICBB 2014 : International Conference on Bioinformatics and Biomedicine
Conference Location : Istanbul, Türkiye
Conference Dates : May 22-23, 2014