APPLICATION OF ARTIFICIAL NEURAL NETWORKS MODELLING TO SÁZAVA RIVER BASIN

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The article deals with runoff modelling from precipitation data in the River Sázava. Authors have used the knowledge from the previous case-study using the data from similar scale Czech River Ploučnice (Neruda at al., 2006). The rainfall and runoff data (both with 1 hour time step) were obtained from Czech Hydrometeorological Institute (CHMI). We scoped a time period of 1. 8. – 11. 9. 2002, mainly because of a flood event on 14. 8. 2002. An in-house software system for hybrid computational intelligence modelling, Bang (Neruda, 2006) has been used for creating and tuning the model. We have calculated with two variants of feed-forward neural networks, namely multilayer perceptron networks trained by back propagation and radial basis function networks trained by combination of unsupervised learning and linear optimization. Both network architectures have been tested on 1-hour and 2-hour predictions. The resulting efficient coefficients measuring the modeling fidelity were variant: 99,6 % (training) and 96,7 % (testing); and 99,4 % and 82,1% respectively. Mainly with testing cases we were able to achieve lower figures than a present situation. This result is in accordance with what we got in the previous calculation in Ploučnice River. We would like to continue our experiments in on-line prediction with real-time date from Ploučnice River in Ústí nad Labem CHMI branch.

References

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